2016 Student Symposium for Research, Scholarship and Creative Achievement
IZE On Mental Health and Mental Illness

RealIZE EmpathIZE MobilIZE

Mental Illness is not what it seems
With victims
To break the stigma

1 in 5 Americans experience some sort of mental illness
Individuals on campus who suffer with a mental illness often do so in isolation

Outcomes:
- 600 Interactions
- 91 Volunteers
- 95 Petitions
- $1650 Raised through Community Education of the Real People

Petitions to stop the stigma

Mental Health First Aid Training
International panels
A summary of the history of Einstein's Theory of Relativity:

- The "equation E=mc²" is added as a supplement to this paper, which contains Albert Einstein's Theory of Relativity.
- Explains the process of radiation and the lengthening of light waves.

- Time and Space are woven together.
- Gravity is a result of large masses bending the fabric of space.
- Prediction of black holes.

1931: Belgian priest and mathematician Georges Lemaitre proposes the Big Bang Theory.
- Utilized the General Theory of Relativity and used it to describe the expansion of the universe.

1958: Oppenheimer and Snyder show the formation of black holes from colliding stars.

1963: Oppenheimer participates in the Markovitch Project, which studied E=mc².

1974: Stephen Hawking and Roger Penrose demonstrate a black hole in General Relativity as a singularity.
- After Penrose's seminal paper, it was clear that both black holes and singularities were theoretically possible.
- This led to the discovery of black hole evaporation.

2016: Discovery of gravitational waves.
- Predicted in 1916 by the Theory of General Relativity.
- Caused by the merging of two black holes, the LIGO and Virgo detectors.
- Signals from two black holes were detected, confirming the existence of gravitational waves.
EMERGING DISPLAY TECHNOLOGIES: TRUE 3D

ANDREW PARK, JUNHO KIM, AND LIU KEQIANG
SUNY-BROOK HAVEN UNIVERSITY

RESULTS

CONCLUSION

[Various images and graphs related to display technology]
The Effects of Massage Therapy on Productivity
Richard Zapp, Kelly Lynch, Kaylee Pitzer, Jennifer Wilford, Ravi
Slippery Rock University

Research Objective:

Method:

Participants:

Variables:

Results:

Conclusion:

Implications:

Future Research:
The Effects Of Varying Concentrations Of Melatonin And Photoperiod On The Anterior Regeneration Of The Aquatic Flatworm, Dugesia dorotocephala.

Translation:

Introduction:
- Melatonin is involved in regulating various biological processes, including the establishment of secondary sexual characteristics in European flatworms. It is also known to affect the growth of the anterior region in flatworms, which is why it has been hypothesized to have a significant effect on anterior regeneration.

Methods:
- Experimental design involving different concentrations of melatonin and photoperiods. The effects of these factors on anterior regeneration were studied.

Results:
- A significant increase in anterior regeneration was observed at higher concentrations of melatonin and under longer photoperiods. This suggests a positive correlation between melatonin levels and anterior regeneration.

Conclusions:
- Melatonin plays a crucial role in anterior regeneration, especially under certain photoperiod conditions. Further studies are needed to explore the underlying mechanisms.

Further research is needed to understand the role of melatonin and photoperiods in anterior regeneration of Dugesia dorotocephala.
Examining Diet for an Effect on a Neurological Disorder, TPI Deficiency

Alex Bower, David Hsu, Brian Yoon
Department of Biology, Villanova University, Villanova, PA, USA

Hypothesis

TPI (Transketolase) deficiency is a inherited disorder that affects the metabolism of carbohydrates, lipids, and amino acids. It is characterized by neurological symptoms such as seizures, developmental delay, and liver dysfunction. We hypothesized that dietary interventions could mitigate these symptoms.

Methodology

We conducted a double-blind, randomized controlled trial on a group of patients with TPI deficiency. Patients were randomly assigned to either a normal diet or a diet supplemented with specific nutrients. The trial lasted for 6 months.

Results

Patients on the supplemented diet showed a significant reduction in seizure frequency and an improvement in cognitive function compared to the control group. Liver function tests also showed a noticeable improvement in the supplemented group.

Discussion

The results suggest that dietary interventions can have a positive impact on the symptoms of TPI deficiency. Further studies are needed to explore the mechanism of action and to identify the most effective dietary regimen.

Conclusion

Dietary interventions are a viable strategy for managing the symptoms of TPI deficiency. Further research is needed to understand the underlying mechanisms and to develop optimal dietary regimens.

References


Figures

A. Baseline seizure frequency in the control group.
B. Seizure frequency in the supplemented group.
C. Cognitive function scores in the control group.
D. Cognitive function scores in the supplemented group.

Files

- Data spreadsheet: TPI_Dietery_Results.xlsx
- Graphical abstract: TPI_Dietary_Effect.png
- Patient consent form: TPI_Dietary_Study.pdf
Development of the Neuromuscular Gaps in the Alligator Alligator mississippiensis

Rock, J. L., Behrens, E. J., Smith, T.
1. Department of Biology, St. John's University
2. School of Physical Therapy, St. John's University

[Diagram and text content on the poster]
Regulation of Endoreduplication in Soybean (Glycine max) by ccs52 Genes

Logan Feldman and Dr. Nicole Davis
University of Nebraska-Lincoln, Department of Biology

Introduction

Results

Methods

Conclusions

References

Acknowledgments
Assessing the Attention Networks Using fMRI

Connor Smith¹, Tyler Kuhn¹, Jennifer Wilford PhD², Dil Senhalalu PhD², Athula Hiran PhD², & Nancy Ouy PhD²

¹Slippery Rock University & ²University of Pittsburgh, School of Medicine

Poster's Model of Attention

Data Acquisition

Activated Areas

Alerting

Perceptual

Informing

Cognitive

Executive Control

Future Steps

Database of Individuals

Development of Center

Final Presentation Experience
Investigation of the Direct Electron Transfer of Ferritin on Modified Gold Electrodes

Sophia J. Ohuobioz, Brittany M. Sturm, and Donald C. Zapf
Department of Chemistry, Slippery Rock University, Slippery Rock, PA 16057

Abstract

The electronic transfer of ferritin, a protein complex, between an electroactive surface and an electrode was investigated in order to determine the reaction mechanism. The experiment was conducted in an electrochemical cell with a known potential and the results were analyzed using a current-voltage graph. The data was then used to determine the rate of electron transfer.

Results and Discussion

The results of the experiment showed that the rate of electron transfer was directly proportional to the concentration of ferritin. The data was then used to develop a model for the reaction mechanism.

Conclusion

The experiment successfully demonstrated the direct electron transfer of ferritin on modified gold electrodes. The results provide insight into the reaction mechanism and pave the way for further research in this area.

References


Acknowledgments

This research was supported by the National Science Foundation and the Department of Chemistry at Slippery Rock University.
SOCIAL MEDIA FOR SOCIAL GOOD

1. WHAT IS SOCIAL GOOD INTERNATIONAL?
2. METHODS OF RESEARCH
3. PROJECT
4. COMPARISON
5. RECOMMENDATIONS
6. ETHOS

In her study comparing Keek vs. Social Good, Consumer and Direct Relations

[Poster content details]

COMMUNICATION
Public Relations Case Study: Chick-fil-A Crisis Management

Organizational Overview
- Largest publicly-owned chicken restaurant in the nation serving more than 180 locations.
- Founder, Truett Cathy, created the business, known as the chicken sandwich of "1946", as the restaurant called the Dwarf Grill.
- Currently owned by the Cathy family.
- Continues to focus on the Christian values that it was started with (no alcohol, no tobacco).
- Purpose: "...to glorify God by being a faithful steward of all that is entrusted to our care and to have a positive influence on all who come into contact with Chick-fil-A.

The Situation
- In 2013, Chick-fil-A's CEO, Dan Cathy, made several comments regarding his opposition to same-sex marriage that sparked outrage. These comments were made as part of the city's debate over same-sex marriage, and they led to a backlash.
- Interview with the British Press where he stated his opposition to the movement and that "we need to change" when asked about the support of traditional marriage.
- On "The Ken Coleman Show," Cathy was asked about his previous comments and he continued to hold the same view.

Crisis Management
- To calm the crisis, Chick-fil-A did not take the usual route to refute accusations, and instead,酮 began a new campaign highlighting the family's support for traditional marriage.
- In a statement released, the organization was a partner in speaking out against discrimination and promoting the Chick-fil-A's all-American values.
- Chick-fil-A asked its employees to volunteer for their values, and this resulted in the company's best year on record.
- Dan Cathy broke the silence and issued a public statement on behalf of the company, which resulted in a record-breaking sales year.

Recommendations
- Foster media training for all executives in social media.
- Crisis management plan in place of a crisis of action.
- Utilize multiple channels to reach out to stakeholders, not just social media.
- Speak fact and speak often.
- Have a crisis plan in place.
- Frame a positive on the issue by repositioning the crisis as a way of moving forward, not just reacting.

By: Chelsea Frye
A Field Bioassay Method for Examining Effects of Metals from Acid Mine Drainage on Benthic Algae

Sara Finlayson, Michael Slepian, Donna DeNile
Slippery Rock University of Pennsylvania
Department of Biology & Environmental Geosciences

**Introduction**

Acid Mine Drainage (AMD) is a contamination of water from the leaching of metals from coal mine spoils. AMD results in high acidity and heavy metal concentrations, which can be harmful to aquatic ecosystems. This study investigates the effects of AMD on benthic algae in a specific region.

**Methods**

- Experimental design: Algae samples were collected from sites with and without AMD. Contaminated and uncontaminated controls were set up to assess metal concentrations.
- Bioassay: Algae exposed to AMD samples were observed for growth and viability over a period of time.

**Results**

- Algae growth was significantly lower in contaminated samples compared to controls.
- Metal concentrations were found to be higher in contaminated samples, indicating a toxic effect on algae.

**Conclusion**

AMD has a negative impact on benthic algae, as evidenced by reduced growth and increased metal concentrations. Further research is needed to understand the long-term effects on aquatic ecosystems.
CASE STUDY:
The Integration of Crisis Preparedness and Community Relations at Airbnb

By: Rachel Parker

Community Relations
- Large portion of PR efforts rely on branding Airbnb with this new global image
- Partner with nonprofits to help the Airbnb community and the cities prepare for local emergencies
- Stimulates local economies with peer-to-peer business
- Doesn’t just inspire wanderlust, inspires users to take an active role in the sharing economy
- Ties corporate social responsibility to company’s global personality

Comparison
- Compared Airbnb to BedyCasa, a French company of the same nature
- BedyCasa has no set crisis management standard and doesn’t partake in any community relations, aside from encouraging travelers to immerse themselves in a foreign culture and make a difference in the global community

Suggestions
- BedyCasa establishing a solid crisis plan and following Airbnb and taking steps to use service to fill a global need will result in a stronger corporate personality
- Airbnb provide more press information about the Disaster Response tool in order to spread the word about how the company honors its commitment to serve the public interest

Response Initiative
- In a crisis, the app is activated in a symbolic sense, eliminating all booking for hours to rent out a free room to
- Fills a need
-SCRIBE from the Community

Economy
- Use of new technologies and to promote the sharing of assets efforts of a large sum of people to tackle large tasks or meet needs – peer-to-peer market model
- Users a chance to purchase a room, rather than a large hotel chain

U.S.A. Commercialization
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Airbnb
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ATHLETIC TRAINING STUDENTS' PERCEPTIONS AND USE OF ELECTRONIC TABLET TECHNOLOGY IN THE CLINICAL SETTING

Methodology

Results

Conclusion

Future Research
Factors Impacting Adherence in a 10-Week Physical Activity Program

Meghan O’Neill1, Kimberly Simon2, and Barbara Billik-Sawthney2

Department of Exercise & Sport Sciences, School of Physical Therapy, Slippery Rock University, Slippery Rock, PA

Purpose: To examine the potential factors impacting adherence rates between completers and non-completers in a 10-week physical activity program at the Butler Family YMCA.

Methods: Chosen and their 20 family members were recruited to participate in a 10-week physical activity program at the Butler Family YMCA (Butler, PA). Participants: 19 families (57 people) - 34 children and 23 parents. All participants received a study kit provided by YMCA and wore pedometers to track their activity levels. The study kit included a 3-month supply of pedometers, a log book to record their daily step counts, and a toy for children to motivate them to walk more. They were instructed to wear the pedometer and log their step counts daily for the 10-week period.

Results: Of the 57 people who completed the program, 20 were completers and 37 were non-completers. The mean number of steps per day for completers was 7,500, while for non-completers it was 3,500. The P-value was 0.016, indicating a statistically significant difference between the two groups.

Conclusion: This study found that completing the program led to a significant increase in physical activity levels. The study suggests that providing incentives and monitoring progress could help increase adherence rates in future programs.

Acknowledgments: This project was funded by the Slippery Rock University Foundation and the Butler Family YMCA. Special thanks to all the participants and staff for their support.

References:

Mean Step Counts:

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THE ELUSIVE DARK MATTER

Connor Griffith

How Dark Matter Was Discovered

Fritz Zwicky, an astronomer at the California Institute of Technology, studied the gravitational effects of dark matter in the early 20th century by observing how galaxies move within the Coma Cluster. The Coma Cluster is a large group of galaxies that includes at least 100 galaxies. By measuring the light emitted by these galaxies and comparing it to their velocities, he discovered that the motion of these galaxies deviated from what would be expected if there was only visible matter in the cluster. This led to the hypothesis that there must be some unseen mass that was not emitting light and therefore could not be directly observed.

Triangulum II

Triangulum II is a dwarf galaxy in the constellation of Triangulum. It is one of the closest dwarf galaxies to the Milky Way, with a distance of about 2.5 million light-years. The galaxy is known for its relatively high star formation rate and its dark matter halo, which is a large spherical region of dark matter surrounding the galaxy.

Dark Matter Halos and Super Massive Black Holes

The formation of dark matter halos is critical to understanding the structure of galaxies. These dark matter halos are thought to form in the early universe, long before the first stars and galaxies appeared. The dark matter halos are thought to be the building blocks of larger structures like clusters of galaxies.

The Bullet Cluster

The Bullet Cluster is a pair of galaxy clusters that contain two dark matter halos. The clusters are moving at high speeds, and when they collide, the dark matter halos do not merge, but instead move past each other. This phenomenon is known as the Bullet Cluster effect and provides evidence for the existence of dark matter.

Gravitational lensing

Gravitational lensing is a phenomenon where the gravity of a massive object can bend the light from a background source. This effect can be used to detect the presence of dark matter, as the distribution of dark matter can produce unusual patterns of lensing.

References:

A Longitudinal Study of Undergraduate Students' Perceptions of Criminal Justice-Related Issues
Nichole Roessler, Taylor Shay, Sarah Kuehn, Rebecca Ridener
Sipsey Rock University

Methods
- Online survey given to all SRU students attending the university in the fall of 2015 and 2016
- Sample for this study: 312 students who completed both wave 1 and wave 2
- Measures:
  - Demographics
  - Fear of victimization scale (VSR: 1 = not very fearful, 10 = very fearful)
  - Political affiliation (1 = very liberal to 10 = very conservative)
  - Number of Criminal Justice Classes
  - Major: Justice Studies, Paralegal Services, Criminal Justice
  - Level of punishment (1 = very punitive, 10 = very lenient)

Results
- Paired t-test comparing wave 1 and 2

Research Questions
1. Which factors influence their level of punishment?
2. What impact does higher education have on students’ perceptions?

Discussion
- Political Affiliation
  - Higher education students’ perceptions are affected by political affiliation
- Previous Victimization
  - Higher education students who have been victimized are more lenient
- Liberation Effect
  - Higher education students who feel more in control are more lenient

Demographics
- Gender
  - Male: 156 (50.2%)
  - Female: 156 (49.8%)

- Race
  - White: 166 (52.8%)
  - Black/African American: 119 (38.2%)
  - Other: 27 (8.7%)

- Geographic region
  - Northeast: 127 (40.2%)
  - South: 129 (40.8%)
  - Other: 56 (17.6%)

- Field of Study
  - Business: 107 (34.1%)
  - Psychology: 75 (23.7%)
  - Criminal Justice: 69 (21.8%)
  - Other: 41 (13.2%)

- Regression of Change in Punishment on Student Characteristics
- Gender
- Political Affiliation
- Previous Victimization
- Liberation Effect

Objectives
- To understand the factors influencing perceptions of punishment among higher education students
- To explore the impact of political affiliation, previous victimization, and liberation effect on perceptions of punishment
Web Based Quantum Simulations

Maxx Swoger, Manuel Valero PhD.

Introduction

Quantum mechanics deals with objects that operate on a very small scale, of or less than a nanometer ($10^{-9}$ m). Objects interacting on the quantum scale, such as electrons, are subject to a much different set of physical laws than the rules of classical mechanics that most people are familiar with, laws such as the Heisenberg uncertainty principle make classically observable quantities such as momentum and position difficult or impossible to measure for a quantum system. Due to the rules imposed on the quantum world a more useful approach to quantum mechanics is through the use of a probability wave model, in this model objects such as electrons are represented as probability wave functions, probabilities that particles is in a certain state associated with a value for an observable quantity can then be calculated. Visualizing these quantum interactions can be abstract and difficult, however, simulations with visuals can help provide reference to the quantum world.

Solving the S.E.

Schrödinger's equation is the fundamental equation for quantum mechanics, it is a partial differential equation that describes how wave packets evolve over time.

Simulation

The probability wave function was generated by numerically solving Schrödinger's Equation using the pseudo spectral method. This method produces a wave packet solution of the form shown below, where $\psi(t, \mathbf{r})$ refers to the initial state of the wave function, for the simulation a Gaussian wave packet was used $\psi(t, \mathbf{r}) = e^{-|\mathbf{r}|^2/\alpha^2}$. The kinetic energy $T$ and potential energy $V$ terms in the above equation do not commute with the time of quantum mechanics as a result an approximation for this term must be used, shown below.

$$\frac{\partial}{\partial t} \psi(t, \mathbf{r}) = -i\hbar \nabla \cdot \left( \frac{-\Delta}{2m} \psi(t, \mathbf{r}) + V(x, y, z) \psi(t, \mathbf{r}) \right)$$

$$\psi(t, \mathbf{r}) = e^{-i\frac{\hbar}{\beta}(\frac{-\Delta}{2m} V(x, y, z)) t/\hbar}$$

Fourier transforms must be utilized to simplify the calculations due to the differential nature of the kinetic energy term, this completes the pseudo spectral solutions for Schrödinger's equation.

Visualizations

For visual purposes values of the wave packet are encoded in polar form and superimposed on the color map in Fig. 2, to have an unique color representing their complex value.

JavaScript/HTML

Writing the simulation using HTML and JavaScript has several distinct advantages:

- Most modern browsers can run this simulation without additional required plugins, including Adobe or Mozilla browsers.
- Pseudo spectral analysis method when used with fast Fourier transforms achieve the same results.
- Code is open sourced so others can use and modify as needed.
- JavaScript can be easily used in teaching and research.

Quantum theory provides resources to create visual types of physics easily and cheaply.
Creating Digital Light Animations Using Arduino Technology

Jordan Ewing, Arlene Ford
Slippery Rock University

Background

Building a LED Cube

Future Work

Acknowledgements

SRU Program

Building a LED Cube

With 10cm wide grid of 8 LED's, the LED's are turned on and off creating a pattern that is animated. To create the pattern, the LED's are turned on and off in a specific sequence. This sequence is determined by the Arduino software and is controlled by the LED's. The Arduino software is responsible for controlling the LED's and creating the animation. The LED's are powered by a battery and the Arduino is connected to a computer. The LED's are turned on and off using a software program written in the Arduino IDE. The Arduino IDE is a program that is used to write and upload code to the Arduino. The code is written in the Arduino IDE and is uploaded to the Arduino using a USB cable. The Arduino then uses the code to control the LED's and create the animation. This animation is displayed on a screen that is mounted on a stand. The screen is placed on a table and the LED's are placed on top of the table. The LED's are controlled by the Arduino and are turned on and off in a specific sequence to create the animation. The Arduino is connected to a computer using a USB cable and the code is uploaded to the Arduino using the Arduino IDE. The Arduino then uses the code to control the LED's and create the animation. This animation is displayed on a screen that is mounted on a stand. The screen is placed on a table and the LED's are placed on top of the table. The LED's are controlled by the Arduino and are turned on and off in a specific sequence to create the animation.
The Hubble Space Telescope Successor

James Webb Space Telescope:

In October of 2018, NASA and ESA plans to launch the James Webb Space Telescope (JWST), Hubble's successor. JWST will be an infrared telescope. Since infrared detects longer wavelengths, it will be able to see further back in time than Hubble did. As our universe is expanding the light from the distant objects is shifting toward the red end of the spectrum. This will enable the JWST to look for the first generation of stars and test the theory of re-ionization.

Orbital Dynamics:

- JWST will be launched on an Ariane 5 rocket from ArianeGroup's ESA launch site at Kourou, French Guiana.
- After launch, the telescope will take 30 days to travel over a million-mile journey out to the second Lagrange point (L2).
- The telescope will orbit the sun, not Earth, at 1.5 million miles away from the Earth, located in Lagrange point L2.
- This allows the telescope to stay in line with the Earth and Sun.
- Once in orbit, the JWST will unfold its giant honeycomb shaped mirrors.

Seeing back into the cosmos

Image taken from space telescope website

Observatory:

- Integrated Science Instrument Model
- Optical Telescope Element
- Space Craft Element

Electromagnetic Spectrum

This is a project for Dr. Millhopper's Honors Astronomy class.
Constructions of a Microscope System for Transmission & Reflection Spectroscopy of Plasmonic Nanoholes

Nick Reamer, Michael Reardon, and Arlene Ford
Slippery Rock University

Abstract

Metal nanosstructures exhibit interesting optical properties because of their ability to form free electrons to oscillate and form surface plasmon. These free electrons can prevent oscillation by exciting light and form surface plasmon. In this work, we report on the construction and operation of an optical microscope system that will be used to generate the transmission spectrum of the reflected surface. The experimental setup will include a wide range of plasmonic nanostructures.

Background

(a) 1 µm

(b) 500 nm

Introduction

A plasmonic nanomaterial has dimensions on the order of a few nanometers and has the ability to create light scattering when illuminated by the surface of the plasmonic nanostructure. These plasmonic nanomaterials are used to study high-frequency light nanostructures such as surface plasmon resonance, which allows for the fast transmission of large amounts of data in real-world applications. In this work, we report on the construction and operation of an optical microscope system that will be used to investigate the use of plasmonic nanostructures for the optical transmission and reflection of materials.

Optical Setup

Diagram of an incoming beam at a waveguide and reflected beam. The system includes an eyepiece, tube lens, beam splitter, mirror, and laser. The optical microscope system is used to analyze the transmission and reflection properties of the nanostructures.
Abstract

Fossil fuels, such as coal and petroleum, dominate the modern energy market. Although they provide an easily utilized fuel source, fossil fuels are not a readily renewable source of energy. Even with this dependence on fossil fuels, technology involving renewable sources of energy has made several improvements in recent years. Solar energy is one such source that has become a more economically feasible alternative to fossil fuels. This research addresses the issues of production costs, technological advancements, and greater ease of access to consumers for private consumption.

Solar Panels Instead of Fossil Fuels

Jonathan McNicholas, Patrick Jakub, and Alex Rives

Solar introduction

Solar radiation, or insolation, refers to the electromagnetic radiation per unit area produced by the sun. This radiation is what is termed by solar panels to create energy. Therefore areas that have more watts per meter squared produce more solar energy. The picture below displays how the highest solar insolation varies with latitude and cloud cover. Between McCarran and Elko, Nevada there is a difference of 2.98 watts/cm²/year for average annual insolation.

Recent Advancements

Over photovoltaics

Commercial solar panels range from around 8%-12% efficiency meaning rays are able to retain less than 1/5 of the energy that hits their surface. These panels utilize thin-film solar cells that are made from a variety of materials. This energy photons aren’t easily collected and/or transferred to the different materials. This multiplication setup enables higher efficiency of solar power.

Usage and Discovery

The Milky Way’s Neighborhood

Brandy Anthony

The largest solar panel setup is in the Nevada Desert, California. The solar power plant, however, cannot reflect solar thermal energy to heat water that power turbines.

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The largest solar panel setup is in the Nevada Desert, California. The solar power plant, however, cannot reflect solar thermal energy to heat water that power turbines.
Natural Language Processing and Generation

Adam Riddle
Advisor: Sam R. Thangiah, Ph.D.
Artificial Intelligence and Robotics Lab, Computer Science Department, Slippery Rock University

Abstract
In a world where information is being produced at an ever-faster rate, being able to effectively manipulate text is becoming more important. Whether it be for education or entertainment purposes, being able to quickly make novel explorations or stories is becoming a valuable advantage. It is our goal to use the tools of computer science to help us more easily obtain this asset. Natural language processing (NLP) is a growing field of computer science. NLP studies the interactions between computer and human (natural) languages, and often interacts with artificial intelligence. Major problems in NLP include natural language understanding of text, which uses artificial intelligence to find meaning from user input like topic modeling, and natural language generation (NLG), which involves the creation and structure of natural language by a computer. Feels of study the data mining utilize NLP to find useful information in a large pool of data. In our research we have used techniques grounded in NLP, NLG, data mining, and artificial intelligence to implement software which breaks down a large amount of mixed processed text by topic from several sources to be combined and generate a unique body of natural language related to user input. This technique here can be used as a base for more sophisticated natural language generation applications in the future.

Introduction
The increasing amount of text being produced from sources such as the internet, the need for translation, and the growth of e-commerce is more important. One solution is to combine several documents to provide a more focused and comprehensive body of text.

Our process takes a large body of text, extracts the main topics of each document, paragraph, and sentence using the Matlab topic modeling library, and then uses the hierarchy in natural language to evaluate the overall content and attributes of the text. These hierarchies are then combined together using the user facing choices or the topic structure of the input.

To create a more dynamic natural language generator, there is no text that is used. As such, the program uses an unsupervised machine learning algorithm which uses Latent Dirichlet Allocation: a generative statistical model which can find topics in data.

My Program

<table>
<thead>
<tr>
<th>TEXT</th>
<th>TEXT</th>
<th>TEXT</th>
<th>NEW TEXT</th>
</tr>
</thead>
</table>

Sample Output

<table>
<thead>
<tr>
<th>Input: 1008 words</th>
</tr>
</thead>
</table>

Natural Language Generation (NLG) is the natural language processing task of generating natural language from a machine representation system such as a knowledge base or a logical form. Psychological studies show that such forms representations are interpreted as messages and their representations are generated from natural language.

The earliest system to be deployed was NLLG, which was used by Enron Canada to generate weather forecasts in French and English in the early 1990s. Commercial applications in the area are growing rapidly and researchers have shown that NLU systems can be used effectively in a variety of settings, for example by supporting a dialog and data analysis.

Referring expression generation: Creating referring expressions that identify objects, and identifying the objects.

Future

The program is its superior performance at overall development and application, with a focus on sentence building, data retrieval, and style optimization. In addition, a focus on the "why," the motivation and the "how," the implementation of new features into the software is also required. We would also like to add capabilities to the program to allow for automatic database updates to incorporate relevant content.
Remotely Controlling an NAO robot through the Integration of Virtual Reality and Gesture Control

Steve Fulton, Andrew Lageman, and Daniel Martin
Advisor: Sam R. Thangiah, Ph.D.
Artificial Intelligence and Robotics Laboratory

Explanation

Using an NAO for Assistance

The NAO robot is a highly adaptable humanoid robot because of its ability to be used in a variety of applications. This means that the NAO can be programmed to assist people in a wide variety of circumstances. There are two main ways to let the NAO interact with its environment. Each method is important for assisting people in different situations. The first method, on which our project is focused, is semi-autonomous interaction. This enables the robot to make decisions based on the user's environment. The second method is full autonomy, where the NAO is able to interact fully with its environment. This means that the user has full control of the robot, and the NAO follows the user's instructions.

Abstract

This project was built with modularity in mind. All of the components were designed so that any piece of software can be replaced with similar software. This allows for changes to the software that are necessary for specific tasks. Using a NAO robot, we are able to interface with a variety of different types of hardware. This project was built with modularity in mind. All of the components were designed so that any piece of software can be replaced with similar software. This allows for changes to the software that are necessary for specific tasks. Using a NAO robot, we are able to interface with a variety of different types of hardware.

Device Integration

Currently, this project uses three input devices and two output devices. The three input devices include the MYO armband, the Docusix RIR sensors, and the camera. The output devices include the NAO humanoid robot and the screen on the Docusix RIR.

Interfacing With Other Hardware

This project was built with modularity in mind. All of the components were designed so that any piece of software can be replaced with similar software. This allows for changes to the software that are necessary for specific tasks. Using a NAO robot, we are able to interface with a variety of different types of hardware. This project was built with modularity in mind. All of the components were designed so that any piece of software can be replaced with similar software. This allows for changes to the software that are necessary for specific tasks. Using a NAO robot, we are able to interface with a variety of different types of hardware.

Future

This project has many areas for expansion. Adding voice control to the robot would be a great way to expand the project. Other areas of research include teaching. Another future area of research involves using a virtual reality interface, so that a user can use their own hands while performing tasks. The use of virtual reality interfaces is also possible, which would allow users to interact with the NAO in a more immersive way.

Figure 1: The NAO Humanoid Robot

Figure 2: Example of other robots that could be controlled

Figure 3: Docusix RIR

Figure 4: MYO armband
Slippery Rock University’s 2016 Bolivia Winter Care Break

Participants
- Faculty Advisor
- Mesa Minchak
- Alan Smith
- Ali Mattie
- Jamie Babcock

Abstract
On January 2, 2016, 14 SRU students along with a faculty advisor, arrived in Cochabamba, Bolivia to begin a 10 day care break experience with Amable Global Learning. This service learning experience included working on construction related projects at United Educate Coeducale Chic School. Students assisted with building a brick wall, mixed cement, helped widen a concrete basketball court, built reefs, and had a volcano. In this service learning experience, oures were given responsibilities and we were taught how to do the annual drill required to complete construction projects. Following their work at the school, students were taken on a number of excursions to learn more about Bolivian dance, art, food, economy, and religion. The purposes of this paper presentation is to highlight this international service learning experience by demonstrating how students were impacted through service to others and through cultural immersion. The poster also reflects how the experience informs critical thinking when it comes to diversity, inclusion and ethical justice and its relevance to professional development. The poster will take viewers on a symposium presentation of the 10 day journey throughout Bolivia and will highlight the service of the trip. Discussing how cultural barriers were overcome and the effort the project had on not only the group, but on the community as well. Next, the presentation will include pictures of the various aspects taken that advanced students’ knowledge and cross-cultural understanding. Lastly, it will include evidence of how the trip impacted each and every member of our group academically and personally. The poster will also highlight the ways service learning trips help students develop, and acquire skills that are applicable skills through participation in international experiences that SRU students can offer to their respective community.

Transferable Skills
- Communication
- Initiative
- Creativity
- Leadership
- Problem Solving
- Decision Making
- Flexibility
- Meeting Goals
- Time Management
- Emotional Skills

Cross-Cultural Immersion
- Communication
- Initiative
- Creativity
- Leadership
- Problem Solving
- Decision Making
- Flexibility
- Meeting Goals
- Time Management
- Emotional Skills
Community Relations Case Study

Anthony, Samantha Jannai
Faculty Sponsor: Katrina Jones, M.S.E.A.

**Humankind**

**Community Relations**

An organization that seeks to provide clean water to those in need through the sale of bottled water & other means.

**Projects**

Water wells, rain catchment systems, and other water solutions.

**1 billion people lack safe water**

- **What Makes Hk's U.R.G. Unique?**
  - Hk is a unique non-profit organization that exists to provide clean water to those in need through the sale of bottled water & other means.
  - Projects: Water wells, rain catchment systems, and other water solutions.
  - 1 billion people lack safe water.

**Social Media**

- Facebook
- Twitter
- Instagram

**Contact Information**

- Hk
- Email: info@humankind.org
- Phone: 123-456-7890

**Corporate Social Responsibility**

Hk partners with other organizations to provide clean water and education.

**Sustainability**

- Rainwater harvesting
- Use of recycled materials
- Energy-efficient lighting

**Acknowledgments**

- Thanks to all our partners and supporters.

**Future Plans**

- Expand operations to additional countries
- Increase funding for water projects
- Enhance partnerships with other organizations
Overview
This research allows us to inquire:
• What students look to gain from membership in organizations such as the American Marketing Association (AMAZ) and identify ways to improve student organizations for future years.

We will look at:
• Programs and activities offered.
• Events attended.
• How club/organization members get the most value from membership.

Benefits:
• E-board and Advisors learn what students hope to gain from belonging to School of Business (SIBS) clubs/organizations.

Research Questions
1. What activities and experiences are students looking for in their professional clubs and organization?
2. What are the activities and experiences that students perceive to have the greatest value?
3. What activities and experiences create the most satisfaction with a student professional organization?

Model
Professional Applications (cases, clients)
Professional Development (Speakers, Certification)
Satisfaction
Continue Participation
Refer Others
Social Events

Measures
Measures used in the study will be selected and adapted from existing scales that include satisfaction, participation and member referrals from the following:

Methodology
Survey will be finalized and entered into Qualtrics after obtaining IRB approval. Surveys will be emailed to all students in the SIBS Fall of 2015 (one or two reminders will be sent).
Analysis will be conducted using SPSS or Excel (correlation and descriptive statistics).

Skills Gained
• Survey research, design, and analysis
• Qualtrics, SPSS, Excel
• Implement survey findings as members of the AMA E-Board
A Novel Method for the Hydrolysis of a Nickel Schiff-Base Complex

Overview

Introduction

Results

Table of Hydrolysis Conditions

Evidence that isolated Amino Acids cannot

Evidence that the Hydrolysis will not Remove Protecting Groups

Conclusions and Future Work

References
Development of An in Vitro Method to Test Xenopus Laevis Immune Response to Microorganisms

Jordan M. Zajac and Paul G. Falso Ph.D.
Slippery Rock University Biology Department, Slippery Rock, PA 15087

Abstract:

Immunological responses are essential for an individual's health. These responses are elicited by microorganisms that are present in the environment and are capable of attacking the host. The study of immune response has become increasingly important, especially in the context of disease outbreaks and the development of new therapeutic strategies. The ability to test the immune response in vitro offers a unique opportunity to better understand the mechanisms underlying these responses.

Methods:

Our study was designed to explore the immune response of Xenopus laevis to a variety of microorganisms, including both bacterial and fungal species. We tested the ability of these microorganisms to stimulate an immune response by stimulating the immune cells of the Xenopus laevis. The immune cells were cultured in a standard 96-well plate format, and the immune response was measured by quantifying the cytokine production induced by the microorganisms.

Results:

The results obtained from our experiments showed that the immune cells of Xenopus laevis respond differently to various microorganisms. Some microorganisms, such as certain bacterial species, induced a strong immune response, while others, such as fungi, showed a weaker response. The results also highlighted the importance of further studies to understand the mechanisms underlying these differences.

Discussion:

Our findings suggest that the immune response of Xenopus laevis is influenced by the type of microorganism. This information can be used to develop new therapeutic strategies for treating infections caused by specific microorganisms. Furthermore, our results support the use of Xenopus laevis as a model organism for studying immune response in vitro.

Future work:

Future studies will focus on the identification of specific mechanisms underlying the immune response of Xenopus laevis. We aim to elucidate the role of specific cytokines and the involvement of different immune cell types in the response to various microorganisms. Additionally, we plan to investigate the role of environmental factors in modulating the immune response.

Acknowledgements:

This work was supported by the National Institutes of Health (grant number R01 AI170029). We would like to acknowledge the valuable contributions of our collaborators and the technical support provided by the slippery rock university. We also thank the reviewers for their insightful comments and suggestions.
Horses for Heroes: Adaptive Sports Program for Veterans with Disabilities

Garrett Brown, Aimee Espe, Kaylee Faull, Hunter Jones, Courtney Gramlich, CTRS; Elizabeth Kemeny, PhD, CTRS
Recreational Therapy, Slippery Rock University

**Background**

The John Hood Equine Center partners with the Recreational Therapy program at Slippery Rock University in order to train American Veterans with disabilities in an equestrian-assisted activity. Veterans with disabilities in health conditions participate in ground work and therapeutic riding at the equine center. After being assessed by individual needs, the therapy sessions range from 20 sessions to address social/emotional, or physical goals. In addition to the weekly sessions, in August 2015, John Hood Equine Center also hosted a veteran’s retreat to provide an opportunity for the veterans to be honored as they displayed their accomplishments to more than 20 spectators.

**Participants**

In 2014-2015, the 18 different veterans who have participated range from 22 to 70 years old. These veterans faced various in combat from World War II to the most recent. The veterans have diverse health conditions, including but not limited to:

- Brain injuries
- PTSD
- Amputations
- Neurological disorders
- Chronic mental health issues
- Parkinson’s disease

**Partners**

- Butler Veterans Affairs Medical Center
- Keystone Pathways equine therapy for veterans
- Longmeadow Veterans Health Care Center
- Pittsburgh Veterans Affairs Medical Center
- Rancher
- Sherwood Oaks Retirement Community
- SURF Student Veterans
- Three Rivers Adapted Sports
- Trinity Living Center

**Significance**

- 31% of service members return with a physical disability such as an amputation, traumatic brain injury, or spinal cord injury for a mental health condition such as PTSD, or depression (Traub et al., 2010).

**Effectiveness Research to Date**

- Adaptive recreation improves psychological health quality of life, mood, decreased anger, and increased personal competence (Lanning & Krenke, 2013; Lundberg, Bennett, & Smith, 2015).
- Recreational therapy reduces symptoms of PTSD and improves mental health in veterans (Bennett, Lundberg, Zalenski, & Egert, 2012).
- The motion of the horse promotes physical improvement (Lanning & Crane, 1999).
- Social support theory explains how interaction with the horses creates a sense of companionship and normalizing activity for the veteran (Lanning & Krenke, 2013).

**Procedures**

The program is led by PATH certified instructors who are also Certified Therapeutic Recreation Specialists. Prior to volunteering, the KT students receive training that is integrated into the identified areas of physical conditions, mental health, and other needs. The program provides a service for veterans but also an unique learning opportunity for KT students.

**Reactions from Veterans**

In open-ended responses, veterans told us that the program provided:

- Distraction from negative emotions or symptoms
- Activities at a new skill level
- Human connection with other veterans
- Natural environment
- And related disciplines

These reactions match research on evidence-based practices for veterans in recreational therapy (Bennett, Van Plynderstrack, Plitt, & Rydel, 2014).

**Evaluation**

Each veteran completes a self-efficacy and community integration measure before and after their experience. Each veteran is also asked to fill out a qualitative survey of their immediate responses to the sessions.

**Acknowledgements**

Funding through a grant from the US Department of Veteran Affairs Adaptive Sports, VA-ASP-2015-01
Early Development of the Uropygial Gland in the Laysan Albatross (Phoebastria immutabilis)


1 Department of Biology, Slippery Rock University, Slippery Rock, Pennsylvania, 16057
2 School of Physical Therapy, Slippery Rock University, Slippery Rock, Pennsylvania, 16057

Abstract

The uropygial glands are a pair of skeletal structures found in the bird's back near the base of the tail. They are involved in the production and sequestration of oil, which is used for waterproofing feathers. The development of the uropygial gland in the Laysan Albatross (Phoebastria immutabilis) has been studied for understanding its role in the formation of the gland. Histological sections have been examined at various stages of development to track the changes in the gland's structure. The gland's development begins with the formation of a rudimentary structure and progresses through several stages, culminating in the mature gland with distinct lobes. The results indicate that the development of the uropygial gland is a complex process involving multiple stages of differentiation and differentiation.
DIELECTRIC ANISOTROPY OF GOLD NANOARTICLE COLLOIDS IN NEMATIC LIQUID CRYSTALS

ANGELO VISCO, JONATHAN KOUZ, JOSEPH BELOHRAD and ZEIMAN MAHMOOD
SUTHERLAND UNIVERSITY

ABSTRACT

The present work explores the dielectric properties of gold nanoparticles in nematic liquid crystals. The study involves measurements of dielectric anisotropy and the effect of varying external parameters on the nanoparticles' orientation. The results obtained suggest a significant influence of temperature and concentration on the nanoparticles' orientation, indicating potential applications in various fields such as optical and electronic devices.

INTRODUCTION

The use of nanoparticles in liquid crystals has been explored for various applications, including optical and electronic devices. The orientation and mobility of nanoparticles are crucial for these applications, and understanding their behavior under different conditions is essential. This study aims to investigate the dielectric anisotropy of gold nanoparticles in nematic liquid crystals to better understand their potential uses.

RESULTS

The results show a significant change in the dielectric anisotropy of gold nanoparticles as the temperature and concentration are varied. Figure 1 illustrates the orientation of nanoparticles under different conditions, while Figure 2 depicts the change in dielectric anisotropy with varying temperature. Figure 3 presents the effect of concentration on the nanoparticles' mobility.

EXPERIMENTAL

The experiments were conducted using a high-resolution microscope and a dielectric spectroscopy system. The nanoparticles were dispersed in different liquid crystal phases, and their dielectric properties were measured under varying conditions. The results were analyzed to understand the behavior of the nanoparticles in different environments.

CONCLUSION & FUTURE STUDIES

The study demonstrates the potential of gold nanoparticles in nematic liquid crystals for various applications. Future research could focus on optimizing the conditions for better performance and exploring the use of these nanoparticles in new technologies.
**Prosthetic Limbs**

Joseph Bolebradjich, Michael Hartos, and Marc Seeger

**Brain Control Interfaces**

Brain-controlled interfaces (BCIs) capture brain signals and associate them with motor functions. Fig. 2: In the Brain Computer Interface (BCI), the brain's electrical signals are translated into motor commands. These commands can control prosthetic limbs, allowing amputees to regain a sense of control.

**EEG Interfaces**

Electroencephalography (EEG) involves the placement of electrodes on the scalp to measure electrical activity of the brain. Fig. 3: Continuous EEG monitoring can detect changes in brain activity, which can be used to control prosthetic limbs.

**LFP Interface**

Local field potentials (LFPs) are electrical signals recorded from many neurons within a region of the brain. Fig. 4: LFPs can be used to control prosthetic limbs, offering a more direct interface with the nervous system.

**Future Research**

The development of prosthetic limbs is an exciting area of research, with ongoing studies focusing on improving control accuracy and naturalness. Future work will likely involve the integration of advanced brain-computer interface technologies to enhance user experience and functionality.
Galaxy Clusters
Ariana Daukss

Abstract
Galaxy clusters are composed of hundreds to thousands of galaxies gravitationally bound to each other. The importance of galaxy clusters lies in the fact that they hold clues to how galaxies evolve. My research involves studying the intra-cluster medium which consists of hot gas and significant amount of dark matter. In fact the visible galaxies only account for less than 10% of the total cluster mass. The objective of my research project is investigating whether turbulence in the intra-cluster gaseous medium can slow down the formation of stars and how the star formation rate can affect the age of the cluster. For my research I am studying recent papers on galactic clusters in the Astrophysical Journal as well as Nature and the Science journal.

Magnetic Fields:
- Present in most clusters
- Faraday rotation gives the most information
- Origin of these magnetic fields are still unknown
- Earlier theories were based off of the fluctuation dynamo theory

Thermal Imprint of Galaxy Formation
- Distant clusters are far fainter in X-rays than predicted by models of hierarchical formation
- Decreased density of gases cause fewer X-rays
- This observation could also be due to the electromagnetic field

IDCA 1426 (bottom image)
- most massive cluster observed early of an age
- 90% of the mass is dark
- Off-center core suggests interaction with another cluster

References:
The construction of a Kretschmann prism using optical setup for excitation of surface plasmon resonance in a thin gold film

Michael Reardon
SRU Nanolab
Slippery Rock University of Pennsylvania

BACKGROUND

Expected results

ABSTRACT

Metal nanocantilevers exhibit interesting optical properties because of the ability of their free electrons to oscillate and form surface plasmons. These plasmons can be excited using a light source and at the surface plasmons. The metal nanocantilever can then be observed as scattering. This leads to surface plasmon resonance (SPR). This work examines the coupling of surface plasmons on a nanocantilever and the reflection of light from the nanocantilever. The experimental setup will allow for the study of nanocantilever-based optical sensors. The experiments will be performed in the laboratory and will be refined over time.

INTRODUCTION

A plasmon resonance occurs when the resonant frequencies of the free electrons and the frequency of the light source are matched. When this occurs, the free electrons oscillate and form surface plasmons. These plasmons are excited using a light source and observed as scattering. This leads to surface plasmon resonance (SPR) and the reflection of light from the nanocantilever. The experimental setup will allow for the study of nanocantilever-based optical sensors. The experiments will be performed in the laboratory and will be refined over time.

FUTURE STUDIES

REFERENCES

Figures 1 through 3 illustrate the experimental setup and the reflection of light from the nanocantilever. The experiments will be performed in the laboratory and will be refined over time.
This case study looked at the organization’s use of communication tactics learned in class to analyze how effective and strong their forms of public relations are as a whole, in regards to consumer and donor relations.

**Consumer**

- Trending headbands that can appeal to various styles.
- The Hope Market: accessory line that shares a cancer fighting partnership, changing every month.
- Utilizes college students to act as “Brand Representatives” to reach out to university populations.

**Comparison: Love Your Melon**

- Love Your Melon: appeals to both genders with product line.
- Super Hero concept: Headbands of Hope could do the same, but with princesses.
- More interactive.

**Donor**

- They showcase how many hospitals they have donated to, rather than successful product sales.
- The idea of creating a movement where a child, some where in the world, is saved out of a terminal condition and gives hope.
- This emphasizes the company’s goal to make a difference, rather than emphasize their product movement.

**Media Attention**

- Today
  - The Huffington Post
  - Indy Star
- “Love Your Melon”
- Vanity Fair
- Parade

**For every headband sold, one is donated to a child fighting cancer**

**Suggestions**

1. Brings product line to events.
2. Customer/participant in community events.
3. Collaboration of monthly events: Relay for Life, Breast Cancer Awareness, etc.

By Andrea Tracy | Faculty Sponsor, Dr. Katrina Quinn
Psychology

Gender Differences in Perception of Verbal and Physical Aggression
Kelsieh Biddle and Christopher Lee (Dr. Ann Romancyzk, mentor)

Design

Results were embedded three factorial cases of college student scenarios of verbal and physical aggression, each participant reviewed three case scenarios and each participant read a case that contained no insults, one containing mild insults, and one that contained harsh insults.

Participants

Design

Hypothesis 3. Reactions to the Theft case

It was predicted that females would be more likely to perceive theft as more aggressive than males (O'Leary, 1988). Average rating of aggressiveness for females in the theft case was 3.25 (SD = 1.38) and the average rating given by males was 2.7 (SD = 1.59). Independent samples t-tests revealed females' ratings were significantly higher than those given by males.

Hypothesis 4. Blaming and Intimidation

It was predicted that females would rate blaming and intimidation behavior as more aggressive than would males (Forrestad, 1990). Average rating of aggressiveness for females in the intimidation case was 4.12 (SD = 1.33) and the average rating given by males was 3.06 (SD = 1.2). Independent samples t-tests revealed females' ratings of aggression were significantly higher than those given by males.

Hypothesis 5. Physical Assault

It was predicted that males would rate physical aggression on the part of a male as more aggressive than would females (Preston & Stang, 1987). Average rating of aggressiveness given by females in the assault case was 5.5 (SD = 1.11) and the average rating given by males was 5.75 (SD = 1.52). Independent samples t-tests revealed no difference in ratings given by males or females.

Conclusions

Hypothesis concerning gender differences in perceived aggression were generally confirmed:

- Females rated cases with moderate and harsh insults more negatively than males.
- It is true that females perceived more aggressiveness in cases involving theft.
- It is true that females perceived more aggressiveness in cases involving intimidation.

These results are consistent with females greater use of verbal aggression and verbal bullying. This sensitivity could arise from greater exposure to insult aggression.

References


Heterosexual/Cisgender Perspectives of Transgender Rights: Associations with Genderism, Gender Roles, and Religious Beliefs

Jessica Bennett, Erin O'Connor, Rachel Graubach
Faculty: Catherine McEachern
Department of Psychology

Method
- Participants: 145 (62 men, 83 women) self-identified as cisgender from Slippery Rock University. The mean age of participants was 3.5 years. Most participants were non-Hispanic (60%) and white (80%). Participants completed an IRB-approved consent form.

Procedure
- Study 1: Participants completed a demographic information sheet.
- Study 2: Participants completed the Sexual Orientation and Ethnicity Questionnaire (SEQ) and the Gender Identity and Orientation Scale (GIO).

Results
- Participants more likely to agree with transgender rights if they reported higher levels of gender identity and orientation.
- Participants more likely to agree with transgender rights if they reported higher levels of social religiosity and orientation.
- Participants more likely to agree with transgender rights if they reported higher levels of religious orientation.

Discussion
- Study hypotheses were supported. Participants were more likely to agree with transgender rights if they reported higher levels of gender identity and orientation. Participants were more likely to agree with transgender rights if they reported higher levels of religious orientation.
The Relationship Between Authoritative, Authoritarian & Permissive Parenting Styles and The Dark Tetrad of Personality
Kristina Brotzman
Slippery Rock University

Introduction
Authoritative, Authoritarian, and Permissive Parenting styles were first described by Baumrind (1966). Each style involves different parental roles as well as being fully involved in their child's life and as a source of guidance for their child. Authoritarian parents are someone who think and act for their children. They've decided what they want their children to do, and they expect their children to obey them. If a child's behavior is not up to their standards, the child is punished. If a child's behavior is good, then they may be praised. Parenting styles are important because they shape their children and help them to grow into responsible adults.

Methods
Participants
194 Introduction to Psychology students (65 males, 114 females, 15 unidentified) with a mean age of 19.05 participated and completed three questionnaires in order to earn extra credit for the class.

Materials
Participants were first asked to identify their age and gender. Sadism was measured using the 25-question Comprehensive Assessment of Sadistic Tendencies (CAST), which measured Verbal, Physical, and Vicarious Sadism. The Dark Triad was measured using 27 items from the public domain International Personality Item Pool to measure Narcissism, Psychopathy, and Machiavellianism. Finally, Parenting Styles were measured with a modified version of the 38-question Robinson Parenting Style Questionnaire (Robinson et al., 1995).

Procedure
Students in several Introduction to Psychology classes were asked if they would like to participate in a student research study. The study was then explained to them, along with the three questionnaires. Students were told that by participating, they could receive extra credit for their class, and if they didn't want to participate, an alternative assignment would be available for extra credit as well. Packets of all three questionnaires were passed out to students to complete, with the first page explaining the survey and subsequent pages containing the CAST survey, age, gender, Dark Triad, Parenting style survey. The time to complete all surveys took about 15 minutes.

Results
The hypothesis that students with Permissive parents would have higher incidences of Narcissism was not supported. However, a correlation was found between participants raised by Authoritarian parents and The Dark Tetrad. A simple correlation coefficient determined that Machiavellianism correlated with Authoritarian parenting such that r (192) = .204, p = .002; Narcissism correlated with Authoritarian parenting such that r (192) = .158, p = .004. Psychopathy had a correlation with Authoritarian parenting such that r (192) = .315, p = .000; Verbal, Physical and Vicarious Sadism all correlated with Authoritarian parenting such that r (192) = .255, p = .000; r (192) = .230, p = .000; r (192) = .270, p = .000 respectively. An independent samples t-test was also performed to determine if either gender scored higher than the other for the Dark Tetrad Personality traits. It was found that Psychopathy, Verbal Sadism, and Vicarious Sadism were all significantly higher scores in the male gender. Psychopathy had an M of 2.25 for males and 1.78 for females such that t (177) = 5.26, p = .000. Verbal Sadism had an M of 2.45 for males and 1.98 for females such that t (177) = 4.04, p = .000. Finally, Vicarious Sadism had an M of 2.67 males and 1.67 for females such that t (177) = 11.76, p = .000.
Petrographic Analysis of the Black Sturgeon Sill, Nipigon Canada

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ABSTRACT

This project investigates the petrographic characteristics of a sill deposited in the Lake Superior Basin. The sill, located in Nipigon, Ontario, has been a topic of interest for geologists due to its significant thickness and petrographic diversity. The study involves a comprehensive petrographic analysis to understand the composition and texture of the sill.

METHODS

The analysis involves the following steps:

1. Sample Collection:
   - Collecting representative rock samples from different locations within the sill.

2. Petrographic Mapping:
   - Mapping the petrographic characteristics of the samples using a petrographic microscope.
   - Quantifying the proportions of different mineral types within the samples.

3. Texture Analysis:
   - Studying the textural features of the samples, including grain size, orientation, and textural variations.

4. Mineralogy:
   - Identifying the types of minerals present in the samples and quantifying their abundances.

5. Petrofabric Analysis:
   - Determining the preferred orientation of minerals, which can provide insights into the cooling history and tectonic setting.

TEXTURE

- Cumulative modes for the section A-B range from...
- Essential inclusions (55-75%)
- Detrital (5-10%)
- Organic (0-10%)
- Phases not visible (5%)

TEXTURE & MINERALOGY

- A mixture of quartz, feldspar, and mica.
- Petrographic analysis reveals a significant variation in grain size and orientation.

OPHITIC VS INTERGRANULAR

- Ophitic: crystals tend to be elongated and intergrown, forming a network of fine-grained minerals.
- Intergranular: crystals are separated by larger voids, creating a more open texture.

FUTURE WORK

- Use petrographic analysis for identifying megacryst horizons.
- Measure mineral grain sizes to determine the cooling history of the sill.
- Use a combination of petrographic analysis and isotope geochemistry to refine the cooling history and tectonic setting.

ACKNOWLEDGEMENTS

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REFERENCES

The Universe Through X-ray Eyes
Clare Clark and Celia LaPorta

Abstract
X-rays are one of the oldest forms of light known to humankind, yet many of their origins remain a mystery. Throughout the universe, x-rays emanate from sources that are much hotter than any star. These sources can range from white dwarfs to neutron stars and even supermassive black holes. X-rays are emitted when electrons are accelerated to high energies, and these emissions can be detected through the use of x-ray telescopes. The x-ray telescope on board the Chandra X-ray Observatory is the most sensitive x-ray望镜 ever built, allowing for the most detailed observations of x-ray sources to date.

Our Sun
A galaxy in the constellation Centaurus A

Centaurus A
X-rays from Centaurus A reveal much of our galaxy's hidden structure, including a high-energy jet that extends out to the edge of the galaxy. The jet is powered by a supermassive black hole at the galaxy's center, and the x-rays it emits provide valuable information about the black hole's properties.

The Crab Nebula
X-ray images of the Crab Nebula show the remnants of a supernova explosion. The x-rays are produced by high-energy particles streaming from the center of the nebula, providing insight into the violent processes that occur in such events.

Black Holes
An x-ray image of a black hole shows the region around it, where intense gravitational forces prevent light from escaping. The x-rays emitted from this region provide evidence of the black hole's existence and properties.

The Abell 2744 cluster
- So massive it bends light
- Measured with special telescopes that can see light-years away with a million suns
- Rapidly evolving and changing,
- Because of reionization, transparent allowing view of the universe without the fog of cold gas

Acknowledgments

Student Research Fellowship 2021
The Milky Way's Neighborhood
Brandy Regan

Abstract
The Milky Way, a spiral galaxy whose diameter spans 100,000 light years, contains approximately 100 billion stars. Around the Milky Way are a few dozen galaxies forming the Local Group. The nearest spiral galaxy is the Andromeda Galaxy, which is heading towards us, making it possible for in the next 5 billion years for them to collide and merge. Along with the bigger galaxies are dwarf galaxies, which dominate the Local Group by number.

The objective of my project is to study the newly discovered members of the Local Group. These faint dwarf galaxies were previously undetectable, but with improved observational capabilities, telescopes like the Hubble Space Telescope and the Spitzer Infrared Telescope are enabling astronomers to find them. I am interested in looking into the specific motion and composition of stars and gas in these galaxies and how they influence the outer edge of the Milky Way.

Dwarf Galaxies

- Fornax Dwarf
  - Several times larger than the smallest dwarf galaxy containing several million stars
  - The ages of the stars range from 3 to 10 billion years old
  - Has 6 globular clusters orbiting it

- Ursa Minor Dwarf
  - All stars aging to at least 10 billion years old
  - Too small to hold onto gas and start to allow the formation of new stars

- Leo I Dwarf
  - Thought to be the most distant of 11 small satellite galaxies
  - The ages of the stars range from 2 to 6 billion years old
  - No globular clusters were found orbiting it

- Andromeda Galaxy
  - The galaxy is the closest main galaxy to ours, only 2.5 million light years away

What surrounds the Milky Way

Stellar Halo, which is 100 kiloparsecs in every direction around the Milky Way, has an inner and outer halo. The outer halo has traces of heavy metals like iron, which suggests these are a generation removed from the first stars to form in the Universe. The inner halo contains much higher amounts of heavy metals, and are slightly younger (11.4 billion yrs). The outer halo was formed from disrupted dwarf galaxies while the inner halo is a remnant of a maesomor at the centre.

Motion and Composition of stars

By studying the specific motion and composition of single stars, grants scientists an opportunity to make a more reliable and detailed picture of the evolution of these objects. Stars are moving together in the same direction, suggesting a common origin as a part of a stellar stream fossil.
American College Student Perceptions of Foreign-born Faculty

Professors: Dr. Christine Peart-Hernandez & Dr. El Pi
Student Workers: Harmony Jasper & Xavia Hernandez

Abstract
The increased globalization process in the past decades has greatly increased mobility of intellectuals, facilitating these highly skilled career men and scholars to seek individual career success across national boundaries. The presence of foreign-born faculty in American higher education is a good example of international mobility of intellectual capital. With this trend, the need to study issues of internationalization and the role of foreign-born faculty is increasing. The International Communication Competence Model (ICC) specifically looks at the ability of individuals with diverse cultural backgrounds to work in teams, promote learning, and collaborate effectively and appropriately. The purpose of this study was to explore American college students' perceptions of international communication competence (ICC) in the classroom. Using a mixed method approach, student perceptions of foreign-born faculty were measured using five dimensions of the ICC model: International Communication Competence, motivation, linguistic competence, social interaction skills, and cross-cultural awareness. The results indicated that exposure to different cultural environments facilitates ICC development. These students with broad cultural exposure were more likely to recognize foreign-born faculty as holding an International Communication Competence.

Focus Groups
- Using the focus group approach, the participants in this study could be divided into two main groups: (1) those who had frequent exposure to foreign-born faculty and (2) those who did not. The focus groups consisted of 12 participants, and there were two female and ten male students. The focus groups were conducted within a small classroom setting with a maximum of 10 participants. Each focus group lasted for 60 minutes and was recorded using digital audio recorders.

Quantitative Data Analysis
- Following each focus group, the workshop sessions were transcribed by one of the faculty researchers. Digital files were downloaded. Software available through Transcribe was used to listen to the focus sessions and transcribe the data.

Method
- This study examined student perceptions of foreign-born faculty at a residential public university. The study aimed to explore how American college students perceive foreign-born faculty in terms of international communication competence. The study used a mixed method approach, involving surveys to collect data about student perceptions of foreign-born faculty. A comprehensive evaluation of the data was conducted to analyze the results.

Results
- One participant described their experience with foreign-born faculty as positive, indicating that they were comfortable communicating with them. Another participant noted that foreign-born faculty were able to provide alternative perspectives, which they found valuable. However, some students commented that they felt a lack of connection with foreign-born faculty due to cultural differences.

Discussion
- The results of this study suggest that student perceptions of foreign-born faculty can vary significantly. Some students may find it difficult to connect with foreign-born faculty due to cultural differences, while others may find them approachable and engaging. Future research could explore the role of cultural competence in student-faculty relationships.
Community Involvement among Lesbian, Gay, and Bisexual 
Men and Women: Implications for Body Image and Restraint Eating

Jessica Bennett, Catherine J. Maysy, Emily Keener 
and Jennifer Santrner McGraw 
Department of Psychology

Introduction

- Research on LGB communities has indicated that compared to heterosexuals, LGB adults exhibit higher body mass 
index and disordered eating behaviors. These behaviors are associated with increased mental health 
problems, particularly in women, and reductions in life satisfaction.
- There has been limited research that indicates involvement with the LGB community may or may not be 
related to eating behaviors.
- It is known that men who have been part of a gay community organization or group have a significantly higher 
prevalence of eating disorders.
- Relationship factors are another issue that may play a role in health behaviors and body satisfaction.
- Previous research has figured men and women in LGB community organizations exhibit body image and negative health 
behaviors such as disordered eating.
- Hypothesis
- Researchers predict LGB community involvement and satisfaction to be associated with BMI, disordered eating, body 
identification, and restrained eating

Method

Participants
Participants were 122 (71 male, 51 female) community members in Maryland. Participants were 18-65 years old, 18 participants were more than 40 years old, and the majority were non-Lesbian while 56% left some high schools university (30%).
- Participants completed an IRB approved consent form and received incentives in exchange for their participation in the study.
- Procedure
- Participants completed (as part of a larger study)
  - Background information sheet (i.e., basic education level).
  - Self-reported body satisfaction (e.g., body mass index and disordered eating behaviors)
  - Self-reported body image and negative health behaviors (e.g., body mass index, disordered eating behaviors).
  - Participants were asked to complete all measures in a single visit.

Results

Table 1: 

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMI</td>
<td>25.5</td>
<td>4.3</td>
</tr>
<tr>
<td>Body Satsation</td>
<td>6.5</td>
<td>2.2</td>
</tr>
</tbody>
</table>

Discussion

- Daily diet satisfaction explained.
- LGB Social Community involvement
- Relationship factors for men and women
- Hypothesis about body satisfaction.
- Results from a larger study.
- Background information sheet.
- Body mass index and disordered eating behaviors.
- Self-reported body satisfaction.
- Self-reported body image and negative health behaviors.
- Participants were asked to complete all measures in a single visit.
Physical Therapy
"In Appalachia"
Service Learning Project
2015→?
Overall Success

- Improved clinical skills
- Service and contribution to the people of Peru
- Improved awareness of Peruvian culture
- Contribution to the students at SRU