



2019

**Penn-York
Undergraduate
Research Association**
**20th Annual
Student Research
Conference**

**NOVEMBER 9, 2019
9:30AM-4:30PM**



CONFERENCE PROCEEDINGS

CLARION UNIVERSITY OF PENNSYLVANIA
840 Wood Street, Clarion, PA 16214

Objective: To promote undergraduate research from all disciplines in the social sciences, natural sciences, applied sciences, and humanities. Students will present their research as a poster or fifteen-minute oral presentation.

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2019 Penn York Undergraduate Research Conference

Clarion University of Pennsylvania

November 9, 2019

CONFERENCE PROCEEDINGS

POSTER PRESENTATIONS

The Relationship Between Instagram Use and Depressive Symptoms

Taylor Achtyl, Hilbert College

Faculty Sponsor: Edward Pristach, Ph.D.

Adolescents and young adults are gravitating towards social media and integrating it into critical aspects of their identities (Dredge, Gleeson & Garcia, 2014). Social media use is classified as the use of forms of electronic communication, such as websites for social networking, through which users create online communities to share information, ideas, personal messages, and other content (Social Media, 2016). Major depression is one of the most common mental health disorders in the United States. Between 2013 and 2016, it affected 8.1% of Americans aged twenty and over (National Center for Health Statistics, 2018). For some individuals, major depression can result in severe impairments that interfere or limit one's ability to carry out major life activities. Current research suggests that depression is caused by a combination of genetic, biological, environmental, and psychological factors (National Institute of Mental Health, 2017). Depression, especially in mid-life or older adults, can co-occur with other serious medical illnesses, such as diabetes, cancer, heart disease, and Parkinson's disease. These conditions often worsen when depression is present (National Institute of Mental Health, 2017). Due to the increasing popularity of using social media, it is crucial to understand the implications it may have on one's mental health. There is little research concerning specific social media networks, such as Instagram and Facebook (Tandoc, Ferruci & Duffy, 2015; Sherlock & Wagstaff, 2018). It is crucial to understand how the use of these apps may emotionally influence its users; as it is becoming more common for children to use these apps regularly (Fardouly, Magson, Johnco, Oar & Rapee, 2018). The current study hypothesizes that participants who use Instagram frequently will also display higher rates of depressive symptoms. For the purpose of this study, the independent variable is frequency of Instagram use; the dependent variable is depressive symptoms. Depressive symptomology is measured using the twenty-item Center for Epidemiologic Studies Depression Scale (CES-D) (Radloff, 1977). A score of 16 or greater on the CES-D indicates the individual is at a high risk for depression. Instagram Use is measured by a self-authored survey.

The sample ($N=100$) will consist of college students - men and women, aged 18-40. The sample will consist of users of social media, particularly the app Instagram. Surveys will be distributed to all classes held during one class block at Hilbert College. A Pearson's Correlation will be used to analyze the linear relationship between Instagram use and depressive symptoms. The proposed research will make a significant contribution to understanding the impact social media use can have on the emotional state of users. Prior research seldom examined specific social media sites, but this study focuses on the app Instagram. If the findings are statistically significant, then the information published can raise awareness to users of Instagram, as well as aid parents of young Instagram users in limiting children's use of social media and encourage healthy social media habits.

The Design and Redesign of the Service Process of a Golf Course

Ryan Adams, Cody Kyko, and Maude Pubert, Clarion University of Pennsylvania

Faculty sponsor: Nripendra Singh, Ph.D.

To be a successful service provider you must be willing to change and adapt your service process model. You must be willing to see and realize what your business must change and the direction it must go in. When it comes to the service that a golf course provides there are multiple fail points or waiting points. The purpose of this study is to find those points and developed ways to minimize or eliminate them. One of the fail or waiting points could be during the reservation process. One way to fix that according to our literature would be, “A device which connects to standard telephone lines and automatically dials into, and receives information from, an automated tee time scheduling system” (Davies and Watson, 1997). The golf industry has seen a decrease in rounds played and is believed to be because it takes too much time to play. While it might not be financially feasible in Clarion other golf course could look at redesigning the course. “By using the traveling salesman problem (TSP) to analyze eight golf courses to see if there could be a shorter path from hole to hole. This led to the findings four of the courses could be decreased, with an average decrease of 8% (Tiger, 2015). This would allow for golf courses to cut down on round times and by keeping the same intervals. Would eliminate wait time on the course. There is other fail or waiting points in the process. Like maintaining the course, preparing and monitoring the carts. Both need their own systems to make sure they are being taken care of properly. For our methodology, we will gather and review secondary sources. Along with we will be going to the service provider. Going through and watching the service process. We will also interview the owners of the provider. The expected results are that the redesign of the service process will be led to a more efficient and effective process. That will minimize or eliminate the fail and waiting points.

Creating an Interactive Social Media Campaign for Building an Online Community

Ryan Adams and Braiden Smith, Clarion University of Pennsylvania

Faculty Sponsor: Nripendra Singh, Ph.D.

Engaging consumers in interactive marketing communication helps businesses build and develop relationships with customers. Social media marketing can elevate brands and business to the next level. Our purpose for this research is to create an interactive social media campaign and test its impact in building an online community. According to our literature review, “the greatest advantages of social media marketing are generating more business exposure and increasing traffic” (Stelzner, 2011) We also discovered that, “an increase in online interactive communication allows a relationship to be developed and sustained, generates sales and revenue, and aids in strengthening customer loyalty and improving the overall satisfaction.” (Zhang, 2015) Lastly, we found that, “When implanting social media strategies on Facebook brand pages, companies focus on factors that prompt electronic Word-of-Mouth about brand contents.” (Haikel-Elsabeh, 2019) For this study, our research focused to answer the question, “how does interactive content increase online traffic and reach potential customers?” Our methods used to conduct this study involved collecting information from secondary sources regarding appropriate campaign content for developing Facebook social media campaigns. We intend to implement our campaign for a period of one month. Upon the conclusion of our campaign, trends will be analyzed using Facebook data analytics and A/B testing will be used to measure the results. We expect that by creating an active online presence, there will be an increase in electronic word of mouth and attract new customers to the business.

Market Feasibility: Discovering the Locomotive Gap

Leo J. Aiello and Joseph L. Downing, Clarion University of Pennsylvania
Faculty Sponsor: Nripendra Singh, Ph.D.

The railroad industry which was once the behemoth of transportation has had its fair share of industry shaping. In recent times, the railroads have seen constriction from factors such as government regulation, growing infrastructure surrounding more automation, and other competition in transportation. However the future does not look so bleak. Some corporate giants have decided to follow a different path, rail yards that have been the same for decades are changing, and technology advances have allowed for smaller, stronger, and more efficient locomotives. Thus leaving the proverbial door wide open. The purpose of our study is to see if there is a gap between what consumers want and what producers are producing. If we do find that gap in the market then we have to bridge that gap. Much of the research that has been done pertains to the factors that shape the locomotive industry. By developing our own research model, we have been able to simplify market research. With the use of a locomotive industry focused feasibility analysis, feasibility factors such as industry conditions, industry demand, economic conditions, effective government policy, competition, and the niche in which a desired firm can fulfill with their product will guide the research in this project. These factors must exhibit favorability in order to prove project feasibility.

Ecotourism in Costa Rica: from the Garden of the Americas to the Jewel.

Taylor Boyle, Clarion University of Pennsylvania
Faculty Sponsor: Sandra Trejos, Ph.D.

Starting in the early 1980s, Costa Rica introduced ecotourism as a way to alleviate their trade deficit. So far, it has been boosting their economy steadily. Through ecotourism, there have been additional market openings, such as businesses devoted to conservation. This has bolstered the economy even more, often funding entire projects in smaller regions. While all of this has been beneficial, there has been little evaluation on whether or not the introduction of ecotourism was a financially stable decision. There have been many policies implemented to sustain the practice, such as regulations on natural resources and special certificates to incentivize sustainable behavior, but will this be enough for the country to thrive? To find out, I spent two weeks in Costa Rica and met with, both large and small, business owners. Some of them had built entire careers around conservation and ecotourism, as is common in rural areas of Costa Rica. After seeing employment through ecotourism in action, I collected data through the Costa Rican Tourism Board and the Central Bank of Costa Rica. These data sets were important to distinguish how much of an impact ecotourism actually has on the economy. Through this, it was evident that the Costa Rican government had cultivated ecotourism in such a way that it was now a stable market. While it was thought early on that ecotourism would be an unreliable source of income, through proper policies and regulations, ecotourism has become a thriving market.

Analyzing India's Economic Interests in Africa

Terrell Brown, Livingstone College (North Carolina)

Faculty Sponsor: Dr. Nisha Singh (Livingstone College) and Dr. Chandra Bhusan Singh (Voorhees College, SC)

The main objective of this research paper is to analyze India's economic interest with Africa. India's economic interest in Africa can be traced back to a long history, but it was very effective and conspicuous after India got independence in 1947. For the purpose of this study, the Reserve Bank of India (RBI) data reports from 2005–2017 have been used. Until 2009, the Indian economy was estimated to increase somewhere between 8 percent and 10 percent annually. Since then, rates have hovered around 5 percent. Nevertheless, India is already the world's fourth-largest economy. According to a study by Goldman Sachs (2008), by 2020, India will boast the

third-largest gross domestic product (GDP) in the world after China and the United States (US), and its consumption-oriented middle class will have increased substantially. India's exports of services started nearly at the same level as Africa in 2001 but grew exponentially at an annualized rate of 23.3%, reaching US\$ 136.5 billion in 2011 from US\$ 16.8 billion in 2001. India is currently ranked 7th in services trade, with exports more than threefold that of Africa, mainly on the back of a boom in computer and information services exports. India's economic interest in Africa now comprises of Technological know-how, Manpower development, Health and welfare, Educational and literacy development, Private sector industrial participation, Financial aids, FDI, and Oil and Petroleum. The traditional goodwill and multidimensional relations were not fully utilized by both regions. Globalization, rising Indian economy, the growing urge of Africa to diversify its economic linkages, provide the new opportunity for two regions to strengthen their economic engagement. Africa. India now has the potential to become a game changer in the current new scramble for sub-Saharan Africa in the future.

The effects of hydraulic oil fracturing and oil drilling on the rates of childhood cancers

Makayla Chestnut, University of Pittsburgh at Bradford

Faculty Sponsor: Sarah Ruffell, Ph.D.

Hydraulic fracturing and gasoline drilling have become more prevalent within the United States over the last few decades. This increased prevalence has allowed for an increased exposure to the dangerous chemicals used within these methods. Data was collected based on usage of hydraulic fracturing and gas drilling. This data was then compared to the rates of childhood cancer in the areas surrounding the work sites. This comparison data was organized into sections discussing different extraction methods, the types of cancers discussed, the overall public health concerns, and what can be done to help this problem. This review aims to discover if there is a certain safe area around the fracturing sites, where the cancer rates have not noticeably changed during the studies. This will be done by comparing the rate of cancer before and after the implementation of the drilling and fracturing sites. The educational significance of synthesizing these concepts is to release information to the public on the dangers hydraulic fracturing and drilling have on the health of the surrounding populations. This review is unique because it focuses on the effects that these increasingly common events have on the children in the surrounding areas, and thus has a chance to greatly impact future generations.

Identifying the Effects of Historic Deforestation on the Deposition of Alluvial Sediments Along the Clarion River

Cole Devine, C. R. Ewing, Brian Fritz, and Avery Larson, Clarion University of Pennsylvania

Faculty Sponsor: Brian Fritz

The Geomorphology of rivers can provide information on both the river's and a region's history. By examining the sedimentation history of a river it is possible to learn more about this historical record. The Clarion River in North Western Pennsylvania has been settled on for thousands of years. This river has played in an essential role in northwestern Pennsylvania through transporting log rafts and other kinds of industrial products. Historic deforestation was rampant in this region during the early twentieth century. Industrialization of the region in both the iron and tanning industries fueled the need for this deforestation. Some charcoal furnaces around the area required acres of forest a day to run. Additionally, almost all of the regions trees were cut down to fuel the massive timber needs of the greater Pittsburgh area. The massive clear cutting required to feed these industries led to changes in erosion and energy of the Clarion river basin. The exposed mineral soils left behind after deforestation began eroding off the hillsides at an increased rate. In addition, flooding increased the throughout the Clarion basin due to decreased uptake by trees and additional runoff. An increase of flooding events could be observed as far south as Pittsburgh. This change in erosion and energy also led to depositional change which can be observed by coring into historic and prehistoric river terraces. Following this time period of increased

erosion and flooding, the Army Corps of Engineers constructed the Allegheny Reservoir in 1965. Additionally, the hillsides along the Clarion river were reforested during this time. River terraces are an extremely useful tool in understanding the geomorphology of a river. River terraces are formed through historic floods leaving the banks of the river and depositing sediments as the flood recedes. These overbank bank sediments tell the story of what kind of sediments are being eroded and thus deposited along a rivers bank. Because of this, river terraces can be used by geomorphologists to reconstruct a river's sedimentation history. The purpose of this study was to identify depositional changes in the Clarion River caused by historic deforestation. Soil cores were collected from river terraces on the eastern side of the Clarion River in Clear Creek State Park. Cores were taken using a 3^{1/4}" bucket auger. Cores were taken in ten-centimeter increments, at each depth qualitative observations were made. The core used in this study was taken from the lowest terrace along the river in the study area. This terrace is the youngest and thus would have the most overbank deposits from the era of historic deforestation. Grain size analysis was used on this core to determine sedimentation changes caused by historic settlement and deforestation. Samples were sieved in each ten-centimeter increment to examine grain size changes throughout the core. The clay percentage for each sample was determined using a settling pipette analysis. Percentages of sand grain sizes and clay were then calculated to examine sediment changes using the GRADISTAT soil analysis software. Indices such as the uniformity index were then calculated for each sample throughout the soil core. Results have shown the development of a second sediment package in the soil cores. A steep coarsening of sediment is observed at the top of the first sediment package. This coarsening indicates increased erosion in the Clarion river basin. This increased erosion is likely due to the historic clear cutting. Following this coarsening, stabilization of the sediment package is observed. In this part of the soil core, grain sizes returned to levels like those at the beginning of sedimentation for this core. This finding confirms the hypothesis that historic deforestation caused increased erosion and flooding within the Clarion river basin.

What's in a Cartoon Face? Analysis of Gender-Typical facial Characteristics of Major Characters in Popular Children's Movies

Kelly M. Distrola, Athena Meadows, and Rebecca McHugh,

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Faculty Sponsor: Rebecca McHugh, Ph.D.

Children love movies, and movie producers make a lot of money from the ticket sales and merchandising from these movies. They design movies to be appealing and relatable to children around the world, and tend to follow some basic design patterns. The characters are intended to be generally recognizable, understandable, and relatable to the little boys and girls who will be watching them, and to the children's parents. But what makes a cartoon character – a representation of often simplistic lines and colors – relatable to a child? One of the first ways that children learn to describe themselves focuses on their gender. By 3 years of age, a child's understanding of gender is often to the point where they can apply the terms "boy" or "girl" to themselves and others (Bem, 1989). But what features are they using when looking at a cartoon? And how to intentional design features, used by artists across the movie making industry, shape a child's expectations for determining another person's gender? In order to begin the process of looking into this topic, we are examining the facial features found in main characters of popular cartoon movies, produced by two major production companies, across the past five years. To do this, we are examining the top 4-7 main characters found in 7 different movies, primarily marketed to an audience as young as early childhood. We will be analyzing gender-typed similarities and differences in features such as eye shape, facial shape, nose shape, typical coloration, etc. We are analyzing these characters to establish typical gender markers used in mass media. This project is the first step in a larger project, which will involve verifying the patterns we find here in a larger pool of children's television programming.

Observation and Analysis of a Food Service Process Blueprint

Aaron Ellis, Maria Neumont, and Jared Scott, Clarion University of Pennsylvania
Faculty Sponsor: Nripendra Singh, Ph.D.

Service design is arguably the most important factor for the quality of the service itself. Prevention of service failures is the most efficient route to higher levels of quality and customer satisfaction. We have analyzed a local Fast Food Service to identify possible points of failure within a food service providers process and to create an updated and more successful design process. During our literature review, we found that studies of wait times were found to influence the profit and sustainability of fast food operations (Lahap, 2018). We also found that speed is shown to be one of the top three factors for people when choosing a fast food restaurant (Dharmawirya, 2012). Fail points in the frontstage operations of a Fast Food Service may include the UI of the Kiosk being cluttered or confusing during the ordering process, as well as time being wasted for both the employee and the customer during the checkout process. Fail points in the backstage operations may include the lack of necessary employees for order completion (understaffing), as well as food being prepared wrong or not ideal. Understanding these fail points as well as the opportunities that fast food operations are important for a service to redesign and become more time efficient and effective.

Our method includes the following:

- Observation and analysis of the current process to determine failure points
- Create a detailed blueprint of the process
- Redesign the process around each failure point
- Analyze the updated process and compare results between the current process and the updated process

We hope that results of this research will help the Fast Food Service that is in need. The expected results from this research and Service Process Redesign are for the service to achieve a faster, more coherent food service process that is provided to enhance the customer experience.

Assessment of Customer Satisfaction for a Nonprofit, Community Fitness Center

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Customer satisfaction plays a major role in consumer and marketing research, being an essential part to a company's success. Studying the needs, quality, and satisfaction can be of value to take corrective action for the services in a fitness club. This study's purpose is to determine the needs of the community and develop new programming to satisfy customers. We look to answer the question of how satisfied customers are with current services and what needs are not being met. Factors that will be studied include the motivations of customers, staff, programs, facilities, and service quality. This service quality will be evaluated in terms of the expected quality that customers place on the amenities offered before use, and the perceived quality of how they actually view the offerings after use. Many articles will be referred to in the course of this study that involve the changing customer preferences, service quality models, and customers' expectations. In depth surveys will be conducted to obtain an understanding of the current level of satisfaction among club members by using service quality scales and satisfaction factors. Responses will be collected using a seven-point Likert scale along with a sample size of 300 club members. Secondly, a needs assessment will be conducted through extensive interviews from approximately 100 prospective community members. The utilized questions in the survey will be further developed from information gathered in the literature review, and then validated using the Delphi Technique. The expected results we hope to receive from this study are the key needs and current customer satisfaction level being determined for the fitness club. Discovering these aspects will help the club have a clearer understanding of the community and how it can better reach their needs.

Preventing the Spread of Chytridiomycosis: A Review of Curative and Preventive Methods

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Chytridiomycosis has been an emerging topic in conservation discussions due to its high mortality rate amongst amphibians and its spread throughout habitats around the world. The research into solving the chytrid crisis is also a young field with much of the literature being published within the last twenty years. This study looked to synthesize literature discussing treatments which aimed to prevent infection of, or cure individuals afflicted with Chytridiomycosis in order to determine which techniques show the most promise of lessening or eliminating the damage being caused by the disease as well as if either prevention or curative methods were most effective. By collecting this information, the conservation efforts of the science community can be more focused on methods which have a higher success rate rather than ones which have been proven to be less effective in trials. Literature was collected using database's search engines with keywords involving different methods utilized in the scientific community. While curative methods have had some success in infected individuals, including heat treatment and antifungal dosing, these methods however have not been well researched and have limited success improving mortality rates of adult and metamorphic individuals. Preventative methods however have found some success in both the individuals themselves as well as the environment in lessening the expansion of Chytrid infection and growth. Thus, according to the current research, preventative methods have higher success at lowering mortality rates and lowering infection rates in amphibian populations. This suggests that further research should be put into preventative methods rather than curing those individuals who are already infected to lessen the damage being caused by Chytridiomycosis to the amphibians in our ecosystems

Methods to Capture RNase-RNA Complexes for Structural Studies

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Faculty Sponsor: Michael Gleghorn, Ph.D.

Ribonucleases, or RNases play important roles in cellular processes through nucleic acid strand cutting. RNases can be very specific in the type of RNA they bind to and cleave. To comprehend the mechanisms of how RNases bind to and cleave cognate RNA, X-ray crystal structures of RNase-RNA complexes can be solved and analyzed. The structural information, especially of the active sites (where the RNase binds and cleaves RNA) are crucial to understanding catalytic mechanisms. In order to obtain a crystal structure detailing respective active sites, a method must be used halt the RNA strand separation while continuing to allow binding. This review paper will summarize the various methods of halting RNA cleavage and provide structural figures detailing methods in the literature that have been successfully used, including metal ion chelation, RNA sequence change, modification of RNA, pH changes, protein mutagenesis. Metal ion chelation displays how metal ions such as magnesium and zinc are necessary for the cleavage of RNA via RNases. When taken away or replaced with other metal ions such as Ca^{+2} , sometimes the RNase enzymatic activity is lost, while still binding the RNA substrate. RNA sequence change shows how RNases that bind and cleave RNA substrates have high specificity for the sequences of RNA they recognize. Altering a specific portion of the RNA substrate sequence can inactivate RNase enzymatic activity. An example of an RNA sequence change affecting the enzymatic activity could be the "C" effect where cytosine residues at the 3' end of the RNA can inhibit cleavage. Modification of RNA includes certain scenarios where modifying the RNA will cause an inactivation of enzymatic activity of the RNase while still binding to RNase. Unlike RNA sequence change, modified RNA adds, subtracts, or changes certain parts of the RNA backbone, while maintaining the order of the base sequence.

An example of RNA modification could be eliminating all 5' phosphates or changing all 2' hydroxyl groups into methyl groups. These modifications will have the ultimate goal of inhibiting cleavage activity while not

affecting binding properties of the RNase-RNA substrate. pH changes affecting enzymatic activity have to do with water molecules that play a crucial role to the active site of RNases and are a part of the RNase cleavage reaction of an RNA substrate. By changing the pH of the solution, water molecules become protonated and the RNase cannot cleave RNA substrates. Certain residues when protonated can also cause water molecules in the active site to be incapable of performing hydrolysis. Protein mutagenesis can be used to inactivate a residue in the active site. By making an inactivating mutation on a specific residue in the active site, binding of the RNA is still possible, while the enzymatic activity of the RNase is diminished. All five of these categories described above halt RNase cleavage and have several Protein Data Bank color coded figures associated with them. Further categories such as altering the crystal medium, modelling or docking, and temperature snapshots are currently being investigated as a means to capturing RNase-RNA complexes. By taking a known crystallization conditions and altering it in some way, variations in nucleotides used to bind to the RNase, such as DNA instead of RNA, can be tested. The new nucleotide can support binding to the RNase as the usual nucleotide does, however the new nucleotide will not be cleaved and degraded. Modeling or docking includes using two known PDB IDs; one of an RNase and another containing nucleotides. By using software such as HADDOCK, a simulation of the RNase and nucleotide can be run to see how they could potentially bind to one another. Finally, temperature snapshots are when the temperature of the target crystals is changed in some way in order to allow binding of the RNase-RNA, while some way making the cleavage reaction stop. An example of this could be the RNase H “freeze trapped” crystal structure. The RNase crystals were soaked with manganese ions for five minutes and then the temperature was dropped to freezing. This made the RNase inactive thus trapping RNase-RNA structure. This review article is currently being constructed to contain many examples of inhibiting RNase enzymatic activity while still binding to the target RNA. It will allow scientists to use one source detailing many options of how to manipulate the RNase-RNA structure in some way with the final goal of solving the X-ray crystal structure of RNase bound to RNA.

Critical Analysis of Financial Contribution of Indian Students in Higher Education in USA

Ahmad Harris, Voorhees College (South Carolina)

Faculty Sponsor: Chandra Bhusan Singh, Ph.D. (Voorhees College) and Nisha Singh, Ph.D.(Livingstone College, North Carolina)

International students in the higher education sector in the United State have carved a niche in the financial contribution of the US economy. The number of Indian students is only second to that of China and this trend is on the upward side year by year. The United States of America, Britain, Australia, and the other European States in the present global scenario attracting international students in the higher education sector, through their policy and promotion. Based on the 2017 Open Doors Report on International Educational Exchange data, the U.S. Department of State Bureau of Educational, and the Cultural Affairs, the number of Indian students in the United States has risen to a record level, to over 186,000 – the fourth year in a row to see double-digit growth in 2015. According to Open Door data the Indian students’ number increasing by 21,000 a growth of 12% and which is 17.3 % of the international students. The majority of Indian students are at the graduate level. On further exploration, it is found that the major chunk of fees is paid by the students themselves. Scholarship, aid or donations contribute not much from the USA. The international student community, on the other hand, contributed \$39.5 billion to the U.S. economy in 2018 and GDP is 20.5 trillion international students contribution is 2% of US GDP and Indian students contributing 6.54 million which is .5% of the US economy. Indian students as financial contributors, in USA educational sector, is an important aspect which is difficult to ignore This paper analyzes the impact of Indian students from the economic angle, its prospect, its impact beyond economics, its constraints and scope and further positive steps to be taken to accelerate the numbers and contribution.

Attracting Customers through a Social Media Campaign for a Distillery

Emily Hofius, Austin Blausler, and David Goodman, Clarion University of Pennsylvania

Faculty Sponsor: Nripendra Singh, Ph.D.

Social media has become an integral part of today's society, and it can be used to effectively market businesses both big and small. Social media gives us the ability to connect with consumers wherever they may be with the help of smartphones and computers. Social media makes reaching new consumers easier than ever. When it comes to social media marketing, interactive content has been found to be the most effective form of media. It has also been proven that consumers are more prone to purchase a product when they feel as though they have a relationship with a business, and social media allows consumers to have instant communication with businesses. The main goal in marketing on social media is to build an audience and to keep that audience engaged with the content that you are producing. The frequency of content that a business posts on social media has a big impact on keeping an audience interested in your product or service. Businesses are constantly trying to gain earned media online, which is created by their share of consumers on social media. Customer reviews, testimonials, and other content generated by customers about the brand are the most effective ways to build loyalty with a customer base, as well as develop a sense of trust and community within your following. Customers tend to purchase from brands that they trust far more often than brands that they have no affiliation with. The many types of social media are also more popular with different demographics, which allows businesses to choose the appropriate social media platform to reach their target markets. The cost-effective nature of using social media marketing makes it an obvious choice among smaller businesses as it costs much less to use than traditional media outlets, such as commercials and billboards. Our research helped us to develop many different ways to market on social media, as well as distinguish what methods of marketing are the most effective

Development of Social Media Campaigns and the Assessment of Its Influence of CDM

Isaac Holland, Jared Scott, and Kayla Molzer, Clarion University of Pennsylvania

Faculty Sponsor: Nripendra Singh, Ph.D.

Social media is a growing force that has seeped into our everyday lives. Many people spend hours liking, commenting, and sharing content that is posted on various social platforms. This content can be said to have a strong influence on people. Because of this, in recent years, businesses have realized the role social media can play. Since social media has become a part of many marketing strategies business accounts, sponsored content, and advertisements have become a standard sight on social media. Social media allows for high customer engagement with relatively little to no cost at the expense of a business. The type of content with a purpose of engaging with consumers is referred to as earned media. While this type of marketing is relatively new, only garnering traction in past ten years, it's important to understand the effect earned media can have on consumers. The purpose of this study is to assess how social media, specifically earned media, can successfully encourage positive outcomes in the customer decision making process. As suggested by previous literature, it is essential that companies have an integrated strategy that places emphasis on consumer experience. Every social platform a company manages should have its data monitored to ensure high levels of productivity. Additionally, 80% of a brands online feedback should come from 20% of consumers. This all ties to the idea that, a social media presence ultimately needs to develop a level of trust between consumers and a company. High levels of trust will translate to positive outcome in the decision-making process for consumers. A descriptive, four-step research design will be implemented to test the validity of these claims on an online rigging and towing retailer. The methodology will be conducted as follows:

1. Establish a Facebook page by November
2. Develop a campaign to begin receiving earned media within in a month
3. Collect and evaluate data from before and after campaign using Facebook analytics
4. Analyze and compare any trends using A/B testing of before and after campaign data

The final results from this experiment should provide quantifiable proof that earned media can provide this business with positive outcome in the decision-making process. These outcomes can be specific in that there should be an increase in website traffic, engagement levels, trust, and sales.

A Case Study of Terraforming on Mars: Research on Microbial Extremophiles

Julia Jiang, Susan Wright, and Jessica Summerson, University of Pittsburgh at Bradford

Faculty Sponsor: Sarah Ruffell, Ph.D.

The colonization of planets like Mars has been at the forefront of microbiology research in recent years. This lab introduces microbiology students to terraforming, the process of making an astral body more earth-like, using microorganisms. This lab informs students of the current research of NASA and Space X through the concepts of problem-based learning and role-playing. Students will utilize problem-based learning skills to solve multiple open-ended questions by analyzing a series of diagrams, charts, and graphs provided by the instructors. Each group will have a Martian colony on the brink of collapse. To save their settlement, they must use the data they accumulate through three “missions” to identify their problem and the microorganisms necessary for stabilization. This exercise is designed for undergraduate students with prior knowledge of cell replication, the microbial growth cycle, the characteristics of extremophiles, and basic problem-solving skills. Students will work in small groups to solve the problems within their colony during a 45-minute lab period. Before starting their “mission,” the groups will partake in a lecture about terraforming. After the “briefing” the groups will begin their mission, unlocking more data and organisms as observations are validated by the instructors or “mission control.” After the three missions are complete, each group will hold a “press conference” to report their findings. This study innovatively shows the process of terraforming by engaging students through an alternative laboratory exercise, which enforces students to use problem-solving skills.

The Status of Women and Economic Growth in Saudi Arabia

Leah Kappel, Clarion University of Pennsylvania

Faculty Sponsor: Sandra Trejos, Ph.D.

Saudi Arabia is economically booming and their GDP is among the highest due to their oil and natural-resource based economy, yet, it is said to be a very challenging place to be a woman. Limited studies have been conducted to analyze the relationship between Saudi women and development; this paper aims to add to the knowledge pool and determine the factors that explain this situation. Using multiple regression analysis, this study shows empirical evidence on how the status of women affects economic development in Saudi Arabia; the main hypothesis being that there will be a positive association between the two. GDP per capita, PPP is explained by savings, trade, both male and female population, both male and female life expectancy, female labor force, maternal mortality rate, women in parliament, and the gender parity index (GPI) in college enrollment. This paper enlightens the academic discussion by finding evidence in support of the idea that although women in Saudi Arabia are investing in themselves, they are not being proportionally absorbed into the labor force.

Service Redesign of Small Town Barber Shop

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Faculty Sponsor: Nripendra Singh, Ph.D.

Services encompass ninety percent of the daily products American consume. Barber shops are a part of a nearly 4-billion-dollar industry that has been steadily increasing over the past five years. This makes it incredibly important for service providers, especially barber shops, to be able to satisfy their consumers. This project will

evaluate a local small-town barber shop and their service elements. It will identify fail points in their service processes and then present potential redesign elements for this business to increase customer satisfaction with their service. Services that plan for growth in reference to processes, participants, and physical facilities are likely to achieve less failures & complications along with higher success rates in the establishment of new services to their existing service system. PSS are crucial; especially with barber shops. Consumers would be unsatisfied if the product and service they are offered do not jointly meet their needs.

This research visits the site and observe how the barber shop functions day to day. Two barbers from the business to further explained the front and back of house processes. This includes, but is not limited to, appointment scheduling, walk in appointments, maintaining of appointments, services provided, and state regulated sanitary procedures. This research will accurately identify potential fail points throughout this barber shop's service processes. These fail points can be in the front or back of the house processes. It then will come up with suggestions of service redesign elements to implement to increase this barber shop's customer satisfaction.

Stress in College Students

Megan E. Murphy, University of Pittsburgh at Bradford

Faculty Sponsor: Mark Kelley, Ph.D.

The aim of this study was to examine stress tolerance and coping mechanisms among the secondary education population. This study examined the stress coping mechanisms that collegiate students in northwestern Pennsylvania use during the academic year. Internal and external stressors, along with positive and negative coping mechanisms, were observed in this population of students. The sample ranged from first semester undergraduate freshman through last semester graduate students. One hundred twenty five students of both the undergraduate and graduate programs completed an online questionnaire through Qualtrics about stress tolerance, anxiety, and coping mechanisms. They were asked to provide how many years of schooling they have completed, gender (if desired), what causes them stress and what they do to cope with stress. Stress tolerance is the ability that an individual possesses to effectively cope with stress. The results of this study showed that students choose coping mechanisms that are negative, which results in a low stress tolerance among this academic population. Data also showed that females were more likely to cope with stress in healthy ways that contribute to a higher stress tolerance over men. Specifically, These mechanisms can include inappropriate sexual activity, drug or alcohol use, using technology as a distraction, and more.

Analysis of Service Redesign Process for Small Town PA Diner

Ashley Poling, Joseph Kerle, and J. Thurston, Clarion University of Pennsylvania

Faculty Sponsor: Nripendra Singh, Ph.D.

Services are established as satisfactory or unsatisfactory based on the customers interaction with the service provider. This perception is stemming directly from the consumer encounter with the service design elements that the organization has in place. In this study, we aim to focus our attention to better understand the service design of a local hallmark, the County Seat. With a more holistic view of the service design elements from first hand encounters we seek to construct a blueprint to identify possibly fail points or excessive wait times that may hinder a consumer's experience with the food service; with the ultimate goal to improve the service design to bypass such negative constraints, allowing for a more streamlined quality customer experience.

Our method will include the following:

- Visit Diner.
- Create a flowchart & blueprint for the business.

- Identify potential fail points in service delivery.
- Redesign to better improve service.

Through this research and redesign we hope to better understand the service process with the intent to increase County Seat's efficiency and a better overall experience for customers.

Internationalizing Remarketed Medical Equipment in Developing Countries through Donation Groups

Katie Raspotnik, Jenna Tech, and Aaron Ellis, Clarion University of Pennsylvania

Faculty Sponsor: Nripendra Singh, Ph.D.

Many developing countries are faced with a shortage of medical equipment, but they may take advantage of the price reduction and other benefits of remanufacturing to solve their perennial healthcare problems that arose from the shortage of medical equipment. They may also take advantage of the generous charities and donation groups that work with these remanufacturers of medical equipment. Remanufactured medical equipment companies are looking for new avenues into the international market, and this take is very creative and new in research. This can help create a new avenue to increase international presence while the developing countries are benefiting from the equipment that is being supplied. We have discovered an opportunity for companies to expand international business by selling remarketed medical equipment to groups that donate to developing countries. We want to better understand the donation of medical equipment considerations of remarketed equipment to developing countries. The issue we discovered is underdeveloped countries are in need of compatible and usable medical equipment and remarketed medical supplies could be the solution to this problem. These countries are supplied with medical equipment not compatible with the resources they have. The articles about remarketed medical supplies being donated will help us come up with solutions to selling internationally. We have found the medical equipment being donated must fit the needs of the recipient to the maximum extent possible. Regardless of where the equipment is going, or whom it is being donated by, there are guidelines and national donation policies that are encouraged to be followed where they exist. The donating group must understand what would be most beneficial to the recipient as a lot of high-end used or refurbished equipment may not be the best option for their conditions. Our method will include the following:

- Identify donor groups willing and able to purchase medical supplies
- Market to them the benefits of purchasing remarketed equipment
- Identify country donor groups want to donate too
- Consider regulations of receiving country to ensure donation is allowed
- Ensure equipment will be beneficial to donor country
- Understand infrastructure and technological systems of recipient country to ensure donation will be compatible.

We are in hopes that this research will help the businesses in need. Marketing medical equipment using donation groups will increase international and global market share of the company. These donation groups can allow for easy access to international markets, benefiting the company and the recipient. This allows for the companies to reach that new avenue into the international markets they might be looking for.

The Discovery, Isolation, and Propagation of a Lytic Bacteriophage for Use in Phage Therapy against Medically Significant Bacteria

Kaia Rearick and Kimberly Westover, Clarion University of Pennsylvania

Faculty Sponsor: Helen Hampikian, Ph.D.

As pathogenic bacteria evolve, antibiotic resistance is becoming more of a concern. The World Health Organization estimates that there are over 700,000 fatalities annually caused by antibiotic resistant infections (WHO). This has led some biologists to fear for a pending antibiotic resistance crisis, where bacteria could be capable of killing people through infectious disease at levels similar to those seen prior to the invention of antibiotics. The human population is in dire need of new treatment options. A class of viruses that infect bacteria, known as bacteriophages, could be the solution, and implementing them in a type of treatment called “phage therapy” may be the answer to this doomsday scenario. If the antibiotic resistance crisis continues, we will eventually face a post-antibiotic era which will greatly impact everyone’s lives. In this world, something as routine as having a tooth extracted could end up being a death sentence. Phage therapy is a treatment that is already practiced in some eastern European countries, as well as in parts of Russia. Unfortunately, it has been woefully overlooked in western medicine, largely due to big pharmaceutical companies refusing to invest in the field. Despite this, phage therapy has the potential to completely revolutionize the way that bacterial infections are treated.

Bacteriophage are widely located throughout the environment in soil and water. The virus’s capabilities include locating its specific bacterial cell, infecting it and forcing it to generate many new phages, and then subsequently bursting the cell, essentially killing the bacterium. This killing power can be harnessed and directed towards bacteria that cause disease in humans as an alternative to antibiotics. This type of phage directed therapy has several advantages over traditional antibiotics. In complete contrast to regular antibiotics, the harmful bacteria within the body are incapable of developing any type of resistance to the bacteriophage. This is because the bacteriophage hijack the bacterial cells DNA replication and protein machinery, unlike antibiotics which usually only have a single target which can be easily altered by the bacterium. Furthermore, due to how the bacteriophage bind to their target bacteria, they are completely specific to the targeted organism(s) and will not cause any harm to the beneficial bacteria found throughout the human body. The phage are prepared either as an oral or topical treatment and administered like antibiotics. In addition to targeting only the infectious bacteria, saving the body’s natural microbial flora, phages are also very easy to isolate and grow. This makes phage therapy much cheaper than antibiotic development. Collectively, all of these factors make phage therapy a very viable option to treat bacterial infections in general, as well as to overcome the antibiotic resistance crisis.

Our project has been implementing methods established by the University of Pittsburgh’s “Phage-Hunting Program” to discover, isolate, and propagate bacteriophage present in environmental soil and water samples. The isolated phage can potentially be used as a treatment for many medically significant bacteria and we are specifically looking to target *Staphylococcus aureus*, *Chromobacterium violaceum*, *Escherichia coli*, *Bacillus cereus*, *Proteus vulgaris*, *Serratia Marcescens*, and *Pseudomonas aeruginosa*. The soil and natural environment around us are abundant with a large variety of phages that work to keep the bacterial populations in ecosystems at regular levels. Due to the massive numbers and variety of phages that inhabit the environment, it is likely that we will find one that is active against one or more strains of our bacteria. We have already gathered soil and water samples from local sites that have a large amount of natural biodiversity such as Cooks Forest State park, Clarion River and Hiking Loop, and various places around New Bethlehem including the creek. Over the summer we were able to gather samples from more distant places including a water sample obtained from Hawaii. Standard microbiology techniques will be used to isolate bacteriophage from the various samples collected. It is our hope that our findings will be able to contribute to the important ongoing initiative to discover new and novel phages as an alternative treatment for antibiotics.

Public Perception of Water Cleanliness as Reported by Pennsylvania Public Libraries

Kristina Rogers, University of Pittsburgh at Bradford

Faculty Sponsor: Sarah Ruffell, Ph.D.

The quality and safety of water are important aspects of any community's health. Because of this, Information pertaining to water contamination should be an integral part of the general public's education. This study aimed to discover how informed the public is about what affects their water quality and its safety. This study also assessed how the public determines if there is a potential contaminant in their water. To obtain this information, a survey was sent to 52 public libraries throughout Pennsylvania. Survey responses were collected over a period of 4 weeks. A reminder to complete the survey was sent after the end of the second week. This state wide research may provide community educators with a better understanding of which contaminants the public is ill informed about and what communities require further education.

The Effects of the Presence of *Spirulina* on Mung Bean Growth

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University of Pittsburgh at Bradford

Faculty Sponsor: Sarah Ruffell, Ph.D.

The goal of this lab is to determine how *Spirulina* growth and death in soil affects *Vigna radiata* growth. This lab experiment intends to cover specific topics from the following areas of biology: botany, ecology, and plant anatomy and physiology. Two controls and six combinations of potting soil with different *Spirulina* conditions will be tested to determine which has the greatest impact on bean growth. The two controls consisted of non-autoclaved and autoclaved potting soil. The six combinations tested in this lab were: autoclaved potting soil or non-autoclaved potting soil combined with *Spirulina* alone, nutrients alone, or *Spirulina* and nutrients. This experiment is required to be split over two sessions: 40 minutes to plant the Mung bean sprouts, and 20 minutes to measure the sprouts. This experiential learning opportunity helped students retain information by combining visual, written, and kinesthetic learning techniques. Furthermore, participating in this experiment provided students with a "hands-on" approach to their education. Ultimately, this lab course was unique because it can effectively taught students how *Spirulina* growth and death can impact the industrial production of *Vigna radiata*.

Assessing Drivers of Ridership to Determine Innovation Acceptance

Megan Schaefer, James Kerle, and Claire Woods, Clarion University of Pennsylvania

Faculty Sponsor: Nripendra Singh, Ph.D.

Public transportation services are a necessity in populous cities to provide accessible mobility to all community members. The decision to expand mass public transit services is one that may not be taken lightly by municipalities who must weigh the costs and merits of all types of transit services. In addition to costs and merits, other factors contribute to the decision-making process of implementing new transportation services including accessibility regulations, customer needs and the behavioral intentions of customers. The low floor streetcar is a 100% accessible vehicle that would combat the issue of congested and populous urban environments. However, because this vehicle has not been widely implemented, there is not much evidence on its success in the market for public transportation. To ensure that this service would provide a return on the investment of infrastructure, a high demand for low floor streetcars must exist. To analyze the market of demand, municipalities will need to look at the drivers of ridership in their areas, along with the desired service characteristics of public transportation that will answer citizens' needs and, overall, predict the behavioral decisions of potential riders. Secondary research and literature reviews depict a significant relationship between drivers of ridership and the decision to switch including but not limited to, accessibility, vehicle capacity, and

service level. Each of these ridership constructs correlate to service characteristics of the low floor vehicle. If these positive attributes are communicated effectively, the negative attitudes of modes of transportation that result from the perceived undesirable outcomes of the decision to ride public services can be eliminated. In fact, the perceptions of service attributes are the most important determinant of preference or choice in consumer behavior.

The study seeks to answer the question of whether the availability of low floor streetcars that enhance ridership constructs will influence consumer behavior. After identifying the ridership constructs as well as considering the other factors that contribute to behavioral decision making including, social norms, attitudes, and perceived behavioral control, further research and results must be developed. This study will utilize exploratory and descriptive research techniques in order to gain insight into various cities in need of this innovation. First, specific cities must be identified as prospective buyers of low floor streetcars. Atlanta, Philadelphia, Memphis and Seattle provide examples of congested urban environments who need an accessible transit solution. To begin the understanding of the needs and wants of these cities' citizens, psychographic and demographic information must be gathered through secondary research. From there, the study will utilize primary research collected from digital survey techniques designed to target the needs and wants of both municipalities and potential riders. Completely understanding the target audience will determine the best means of communicating the survey questionnaire. Finally, statistical methods of analysis will help gauge attitudes and behaviors of consumers who use and might intend to use public transportation. The hope is that the results of this study will determine that the significant ridership constructs will influence behavioral decisions to exhibit a demand in the market of low floor streetcars.

Luminescent effects of genetically modified HB101 K-12 *E. coli* in turnips (*Brassica rapa*), onions (*Allium cepa*), and radishes (*Raphanus raphanistrum*)

Katie Snyder, University of Pittsburgh at Bradford

Faculty Sponsor: Sarah Ruffell, Ph.D.

Introduction of pGLO HB101 K-12 *E. coli* into individual samples of turnips, radishes onions has a higher rate of expression plants with thicker roots. This study compares absorption and expression of pGLO bacteria in turnips (*Brassica rapa*), onions (*Allium cepa*) and radishes (*Raphanus raphanistrum*) based on root measurements and fluorescent properties. Plants were grown in stable conditions at roughly 21 degrees Celsius until germination was complete. The *E. coli* from BioRad's pGLO Bacterial Transformation Kit were then placed in the plants' soil. pGLO bacteria contain a plasmid with genes that encode green fluorescent protein (GFP), antibiotic-resistant genes and the arabinose operon regulatory protein (araC) from *Aequorea victoria* (pGLO). After addition of the bacteria, the plants were then divided into two groups: All plants in the first group received an addition of 1 mL sugar solution. When added to the soil of germinated seeds, the bacteria were absorbed through the roots' xylem and further transported to varying organs. Analysis included the following: absorption of genetically modified (GM) *E. coli* in each plant, intensity of light produced from the plant, excitation peaks of GFP, locations and concentrations of luminescing cells in the plant and the overall plant growth. Preliminary research replicating the procedure with food coloring instead of bacteria suggested that plants were capable of absorbing and expressing color, moreover fluorescent properties. This research could be used in the future regarding autoluminescence, where plants would be genetically modified to express fluorescent properties. Botanic, genetic modifications could be useful from environmental and economic views, where luminescent plants could potentially decrease the need of electricity.

Organizational Hierarchies of Long-term Care Facilities

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According to a report generated by the US Department of Health and Human services in 2010, there are 31, 100 residential care facilities in the United States (Eunice et al., 2011). Residential care facilities provide both short and long-term care for individuals across the lifespan. These facilities employ different levels of trained nursing staff, including registered nurses (RN), licensed practical nurses (LPN), and certified nursing assistants (CNA), as well as administration (e.g. human resources, social workers, and directors of nursing (DON)) that will assist in providing a high quality of care to the individuals that reside there. This project will examine how a sample of long-term care facilities are organized in terms of hierarchy and job titles, duties, and how many staff members fulfill key roles. Because some facilities have a larger maximum capacity of residents, they employ more administrative personnel and nursing staff in order to meet the needs of each resident. Informal interviews were conducted with levels of administration that are directly under the administrator of the facility (human resources director, social services director, business office manager) along with the DON of each facility to gather an understanding of how each of the nursing departments operate on a daily basis. The populations served by these long-term residential facilities range from those who require physical therapy and assisted living as well as those who require more specialized care due to their specific illnesses, physical limitations, and memory impairments. The organizational hierarchies were drawn based on the information given about each of the departments by the administrative personnel. The hierarchies were then validated through member checks by the DONs in each facility. Three of the four facilities were for-profit facilities, with only one being a privately owned, non-profit facility. While the four facilities differed in many ways, each of the facilities participated in either daily or weekly “care plan” meetings to ensure that each resident receives the level of care they require and that their needs are being met. While there were many similarities between the types of staffing and administration in each facility, each had unique organizational structures. Analysis of these structures lays a foundation for a futures project that will involve interviewing the nursing staff of each facility.

Increasing Consumer Foot Traffic through Curb Appeal

Reese Stiller and Maria Neumont, Clarion University of Pennsylvania

Faculty Sponsor: Nripendra Singh, Ph.D.

Curb appeal is the first thing consumers see so, it must leave a good impression. It has been found that many consumers choose to shop at a certain location due to the exterior appearance (Wayne ,2018). In addition to this, many first-time sales are based off of curb appeal. It can be concluded that potential consumers can be influenced to shop by a store’s exterior.

The purpose of our study is to determine the importance of curb appeal and what variables influence consumer foot traffic. The five major factors that have been determined to influence and increase consumer foot traffic are as follows: 1) window displays, 2) landscaping, 3) signage, 4) design, 5) and color. Signage plays a huge role in directing customers to a store’s location therefore increasing consumer traffic. Signage can be broken down into two categories: billboards and directional signage. Billboards help to spread awareness of a business while directional signage helps with customers physically finding the store. Both are crucial for a store’s curb appeal. Window displays offer a small insight into what the store has to offer. This allows customers to determine if they would be interested in shopping at that location or not. Landscaping provides an aesthetically pleasing exterior environment that attracts consumers and enhances their mood. In addition to this, colors are known for evoking certain emotions that can be used to attract customers as well. All of these factors contribute to the exterior environment and play a role in influencing consumers to enter a store.

Our methodology included three phases. The first phase was collecting information through explorative and descriptive research. This included researching the major constructs of curb appeal and how they affect

consumer traffic. Our second phase includes collecting data using a self-administered survey in store. We will conduct this survey using the 7-point Likert scale generating responses over a three-week period. Our third phase involves the usage of appropriate statistical tools to run analyses such as regression and correlation. Results will then be interpreted to determine the effectiveness of the new curb appeal aspects. Our expected results from this study are to establish the key factors of curb appeal and to increase consumer foot traffic as well.

With our anticipated finding of how important curb appeal is to brick and mortar stores, in particular furniture and antique stores, the types of curb appeal can be spread to multiple businesses. It is with great anticipation that there will be a significant increase in sales that is correlated with the increased consumer foot traffic, which will ultimately lead to further profitability for those businesses. To recap on some of the ways to increase curb appeal is to use signage, landscaping, color choices, using proper design, and window displays.

Multi-Dimensional Services Redesign of the Clarion County YMCA

Jenna Tech, John Patrick, Braiden Smith, and Emily Hofius, Clarion University of Pennsylvania
Faculty Sponsor: Nripendra Singh, Ph.D.

Nonprofit organizations provide more than just a service, they provide opportunities. They may provide services such as programs and initiatives to help everyone realize their potential and succeed. These nonprofits may offer a variety of services, but they may have fail points that require them to build trust within the community in order to meet their community needs. Building trust may be as simple as improving employee turnover, creating a safer environment, and better organization. The purpose of this research is to identify the fail points of a local gym to allow it to benefit from this work. This can be done by redesigning the blueprint of the services provided to improve a nonprofit organization's communication of their values. We want to create possible solutions to improve the fail points and build community trust in doing so. During our visit to a nonprofit service provider we noticed a few fail points within their services that need improved. We were also told they believe one of the biggest things they need to work on is building trust, which can be done through these improvements. To understand how this can affect the service providers, we asked what are the missing factors in the service design that could improve consumer relations. We found that the first emphasis of building trust within a facility focuses on the organization and cleanliness of the facility. If the organization can not maintain its own facility in a proper manner then how are organizations going to take care of the clientele. Having a professional setting is significantly beneficial when retaining clients. Consumers will feel they are properly being taken care of. This also includes the simple concept of building accessibility. Companies will also find success when treating consumers as individuals. Simple things such as learning names and starting conversations with clients is beneficial. This makes the experience more welcoming to the consumer. It can also be beneficial in alerting the consumer of any problems. Since the company has built up a repore with the clients, potential problems could be solved with ease. Setting proper rules for other consumers to follow is a necessity so that all consumers feel comfortable. This builds trust because consumers will feel comfortable in a new atmosphere. After asking what are the missing factors in the service design that could improve consumer relations and looking into possible solutions through research, this notes key fail points that need improved. Improvements in some nonprofit organizations can include the following, as it did in the one we visited. A descriptive research design and survey would be best to use to lower employee turnover by asking various questions on ideal work benefits. Applying an additional datasource for front desk operations such as handling guest and membership passes may help ease any confusion and provides a backup source. The safety needs to be ensured in order to gain consumer trust, so any fail points that are unsafe need to be further evaluated and researched. Once that is done, they need to create a viable solution. We are in the hopes that this research will help nonprofit organizations, or at least hold as a starting point when looking at fail points. This can be done by lowering employee turnover, building a safe environment, and creating better efficiency for nonprofit organizations by building trust. This will eliminate those fail points within a nonprofit organization and create a new service design blueprint.

Determining Location and Key Marketing Strategies for Food Truck Business

Andrew Vonada, Saif Khan, and Vaughn Wallace, Clarion University of Pennsylvania

Faculty Sponsor: Nripendra Singh, Ph.D.

A semi- local dine-in restaurant with carry out, catering, meal prep business located in small town in Pennsylvania, would like to start a food truck. Food truck is a growing business but its success depends on strategic locations and relationship with its customers, apart from other factors. The purpose of this study is therefore to find efficient and effective ways to determine locations and form customer relationships for a food truck business in Northwest Pennsylvania. Primary and secondary research will be utilized throughout this project. Social media will be a point of emphasis to form customer relations and to support location decisions. Also, interviews will be conducted with similar businesses such as successful food trucks in Pittsburgh to provide insights on strategic locations, set up, and other aspects of business in this region. Finding a profitable location is what is going to help local food truck business. Food truck business constitutes to be the major source of revenue for a restaurant due to minimal expenses and direct income received in minimum efforts and risk. The desired goal is to identify strategic locations and other key factors that will influence this business to develop customer relationships and earn profit. The final result will allow the food truck to focus on determining locations and marketing strategies along with serving quality food to satisfy the needs of the customers.

Influence of Company Partnerships with Nonprofit Organizations on Branding

Emma White, Ryan Moore, and Jonathan Vannatten, Clarion University of Pennsylvania

Faculty Sponsor: Nripendra Singh, Ph.D.

In today's world, consumers are demanding more ethical and responsible behaviors and activities from companies. Due to this increasing demand from society, companies are now initiating corporate social responsibility programs into their strategic management plans. Companies who implement CSR programs are not only bettering society, but are also gaining competitive advantages while performing these actions and services. For-profit companies have the opportunity to partner with non-profit organizations as a form of their CSR program(s). While this may lead to a positive brand image for the for-profit company, there are different constructs that can alter the overall brand image. Further investigation of the influence of company partnerships with nonprofit organizations on branding will be conducted in this research. The object of this research is to provide applicable data on how businesses of all sizes, can improve their brand image through corporate responsibility. Companies that engage in philanthropic work are able to gain competitive advantages within the market. Through our literature review, we were able to gain an understanding of the importance of NGO partnerships and how if implemented correctly, they contribute to a better brand. We also learned how the role of consumer trust plays a part in CSR, brand equity, and corporate reputation. As a research group, we have concluded that the research question is, "*How do company partnerships with NGOs influence branding?*". Our research model focuses on four main scales from consumer perspective of CSRs, trust, brand equity, and corporate responsibility. The model indicates that CSR impacts trust, brand equity, and corporate responsibility while trust also impacts brand equity and corporate responsibility. For our methodology, exploratory research will be used. Secondary sources will be used to identify relevant variables. Self-administered surveys will be used to collect data. The survey instrument will be composed of the four identified constructs of CSR, trust, corporate reputation, and brand equity. A seven point Likert Scale will be used to collect the responses from 200 prospects from the Pittsburgh area. After the data has been collected, appropriate tools will be used to analyze and interpret the gathered results. We are hopeful that the information and data that we collect will be able to help businesses improve their brand image. CSR activities and programs can provide companies with strategic management plans that can better society while also improving their overall image within

communities. Partnerships with nonprofit organizations can be incorporated into companies' CSR programs in hopes of improving their brand.

A Computational Mechanistic Study of the Degradation of Hydrofluoroethers

Adam Williams, University of Pittsburgh at Bradford

Faculty Sponsor: Daniel Sadowsky, Ph.D.

Hydro(chloro)fluoroether anesthetics (HFA's) are known to degrade in the presence of alkali hydroxides. A previous experimental study suggest that this degradation is caused by the deprotonation of difluoromethyl groups followed by α -elimination (alpha elimination) to form difluorocarbene. However, ab initio calculations suggest that additional mechanistic pathways are possible.

Analyzing Microplastic Content of Tap Water

Jordan Yaros, University of Pittsburgh at Bradford

Faculty Sponsor: Sarah Ruffell, Ph.D.

The purpose of this study is to increase public awareness and encourage the application of the scientific method through a hands on experiment. This will help the public grasp the methods of scientific research, while also informing them about the quality of their local tap water. Approximately 50 libraries around Pennsylvania have been collecting tap water samples, in which participants at this event, will have the opportunity to test for tiny plastic particles. To begin the event, an interactive talk will be held which familiarizes participants with the scientific method and applying the steps to the water sample test. Questions will be formed, making hypotheses as to what contaminates the local tap water. After the experiment is complete, the results will be analyzed and conclusions will be made as a group in regards to the microplastic content of the local tap water. This exercise is unique because it provides the public with an opportunity to conduct a real scientific experiment with results that they can utilize to shape their everyday habits.

The Effect of Autonomous Sensory Meridian Response (ASMR) on Brain Wave Activity

Margaret Youngs, Hilbert College

Faculty Sponsor: Edward Pristach, Ph.D.

Autonomous Sensory Meridian Response (ASMR) has been reported as a feeling of being either in a relaxed, sedated state or a focused and concentrated state (Barratt & Davis, 2014). Despite the growing number of reports of experiences of ASMR there is a lack of scientific research focused around it. A recent search of the literature has found that there have been no studies involved in investigating the role of alpha and beta waves; which could play an important role in the physiological aspects correlated to the experiences of ASMR. To investigate the role of alpha and beta waves in experiences of ASMR, six participants will be measured using an EEG system while participants watch three different stimulating videos. The first video will record baseline alpha and beta waves; the second video, will record alpha and beta waves while a participant is watching a more stimulating video and the third video will consist of ASMR triggering stimulations. Stephen D. Smith, Beverley Katherine Fredborg, and Jennifer Kornelsen suggested that the DMN of individuals with ASMR has demonstrated increased connectivity between regions in the occipital, frontal, and temporal cortices of the brain. This suggests that ASMR can be associated with a blending of multiple resting-state networks. This atypical functional connectivity likely influences the unique sensory responses that are associated with ASMR. The examination of the resting state alpha and conscious state of beta can assist in further understanding if resting-state networks play an important role in the experience of ASMR. It is hypothesized that there will be a

decrease in alpha waves compared to baseline and an increase in beta waves compared to baseline for participants who are not experiencing ASMR because they will be concentrating more on the stimuli compared to being relaxed.

Ecotourism in Costa Rica: from the Garden of the Americas to the Jewel

Taylor Boyle, Clarion University of Pennsylvania of Pennsylvania

Faculty Sponsor: Sandra Trejos, Ph.D.

Starting in the early 1980s, Costa Rica introduced ecotourism as a way to alleviate their trade deficit. So far, it has been boosting their economy steadily. Through ecotourism, there have been additional market openings, such as businesses devoted to conservation. This has bolstered the economy even more, often funding entire projects in smaller regions. While all of this has been beneficial, there has been little evaluation on whether or not the introduction of ecotourism was a financially stable decision. There have been many policies implemented to sustain the practice, such as regulations on natural resources and special certificates to incentivize sustainable behavior, but will this be enough for the country to thrive? To find out, I spent two weeks in Costa Rica and met with, both large and small, business owners. Some of them had built entire careers around conservation and ecotourism, as is common in rural areas of Costa Rica. After seeing employment through ecotourism in action, I collected data through the Costa Rican Tourism Board and the Central Bank of Costa Rica. These data sets were important to distinguish how much of an impact ecotourism actually has on the economy. Through this, it was evident that the Costa Rican government had cultivated ecotourism in such a way that it was now a stable market. While it was thought early on that ecotourism would be an unreliable source of income, through proper policies and regulations, ecotourism has become a thriving market.

ORAL PRESENTATIONS

Probation Flaws

Jaazaniah Alexander-Hayes, University of Pittsburgh at Bradford

Faculty Sponsor: Helene Lawson, Ph.D.

The meaning of probation is the release of an offender from detention, subject to a period of good behavior under supervision. Probation is supposed to be a substitution for prison and jail. It is a way for people who commit crimes, to still be integrated in society and still be able to be an active member of society. However the current probation system is set up for offenders to have to live their life in fear of being sent back to prison for minor violations. People who are sentenced to probation are to check in with their probation officer, pay off their court fees and fines, take mandatory drug tests and many more strict rules that if not followed could extend a person's probation or send them back to jail. Studies show that the current policies for probation aren't working as far as rehabilitation, and result in many americans who are sentenced to probation to be sent back to prison or they fail to finish the program. I got the privilege to interview 2 great young African American males about what they went through while being on probation; both of them gave reasons as to why the probation system should be changed. The research presented throughout this paper shows why probation does not help with rehabilitation.

What's for Dinner?: An Examination of Food Insecurity in a Rural Northern Appalachian Community

Andrea Allegretto, Brianna Cardoni, Ashley Cizek, Amanda Fraser, Jessica Liu, Darbi Mercer, Melanie Shipe, Chinue Thompson, and Derica Walker, University of Pittsburgh at Bradford

Faculty Sponsor: Tammy Haley, Ph.D.

Introduction: This project takes place at the University of Pittsburgh at Bradford (UPB) in fall 2019. The study will include synthesizing prior research on food insecurity on college campuses; implementing a student driven survey utilizing self-reported academic success and perceived food insecurity; and the assessment and cataloguing of available community resources for food and nutrition assistance. The surveyed population will include all current students of the University of Pittsburgh at Bradford.

Background: This project explores the prevalence of food insecurity among college students and the relationship between food insecurity and their academic success. As defined by Healthy People 2020 (2019), food insecurity is the lack of financial security and other determinants that interrupt an individual's ability to obtain food (Food Insecurity section, para. 1). This issue can affect anyone at any time and does not have a definite face. One in eight Americans are reported to suffer from food insecurity according to the United States Department of Agriculture (USDA). Individuals who experience food insecurity fail to meet basic physiological needs according to Maslow. Maslow's (1943) hierarchy is comprised of five basic needs including: physiological, safety, belongingness and love, esteem, and self-actualization (p. 370-371). Without a reliable food source, the individual experiences a nutritional deficiency and is unable to move up the hierarchy to meet other needs. (Maslow, 1943, p. 370). The implication for food insecure college students is poor academic performance, physical, and mental health/wellness.

Prior research has shown a correlation between food insecurity and a decline in both physical and mental health, specifically among college students. This decline negatively impacts the student's academic performance and future successes. The problem of food insecurity is evident among many college campuses that are located in rural communities in the United States. As of 2017, there has been recorded 450 food pantries on college campuses due to this increasing issue of food insecurity (Henry, 2017, p.6). Food insecurity is becoming an increasing problem, and colleges have begun to study their own campus (Henry, 2017, p.6). Research includes

who is affected by food insecurity, resources to help provide a reliable food source, and solutions to decrease this problem.

Project Goals: Our project goals include an assessment of the level of food insecurity among UPB college students. As well as, assessment and cataloguing of available community resources for food and nutrition assistance. We will be investigating the level of utilization of resources which provide enough food for an active, healthy lifestyle. Based on evidence obtained, we will work with the project partners to propose strategies to increase the level of food security for the target population.

Methods: We have partnered with Metz Culinary Management, and the Office of Community Engagement, which administers UPB's Panther Pantry. To best identify what resources students currently use an electronic survey will be conducted. This 21 item anonymous survey was crafted using a combination of individually created questions and questions taken from the USDA six item short form survey, was created using Qualtrics software provided by The University of Pittsburgh. The survey was emailed to all currently enrolled UPB students. The survey includes demographic questions such as race, gender, and employment status. Additional questions are related to food insecurity and the availability and utilization of community resources. Other questions include housing information, current midterm grades, and, access of meals. The survey assesses the use of outside resources by students. We have assessed local resources on campus and in the community by physically visiting the locations by interviewing present staff members.

In order to promote student engagement in completing the survey, we advertised using flyers and informational tables in the student common area. An email was sent a week prior to the release of the survey to encourage students to participate. Student responses to survey questions on Qualtrics are automatically calculated and saved to the system. Data will be analyzed using qualitative and quantitative methods. Preliminary findings will be discussed. Recommendations will be grounded in the data.

Empathy and Creativity on Our Campuses and in Our Lives

Nic Allis, DaJanaé Drake, Kirk Rollan, Samantha Schiebel, and Kat Wurth, Clarion University of Pennsylvania

Faculty Sponsor: Ellen Foster, Ph.D.

Our panel emphasizes the value of empathy. Samantha Schiebel will offer a contemplative and research-based presentation on the various benefits of empathy for students, teachers, and professionals. These examples will serve as food for thought; building up to the presentation's main takeaway: empathy is necessary for flourishing, and still matters in an increasingly self-interested society. Then, illustrating the role of empathy in creative work, Kirk Rollan will present "Spilled Milk," a narrative focused on childhood experiences, Nic Allis will present poetry as a way to cope with depression and anxiety, DaJanaé Drake will share her poetry focused on heartbreak, intertwined with the imagery of sea life, and Kat Wurth will share her poetry and its creative expressions.

A Study on Millennials' Behavior towards Biosphere Reserve in Latvia

Anda Arklina, Vidzeme University of Applied Sciences

Faculty Sponsor: Agita Livina, Ph.D., Vidzeme University, and Nripendra Singh, Clarion University of Pennsylvania

Although worldwide the number of reserves and national parks are growing, it is needed to pay attention to young people as important target group, particularly in the future. Do they visit and revisit nature-protected areas and do they pay special attention to them, as well – what motivates to visit these areas – are questions that

comes in focus in latest researches (Njagi, et.al., 2017; Falgoust, 2017; Cetinkaya, 2018; Druvaskalne, Livina 2019). The experience of nature can have a very strong emotional impact on a person, especially a child or adolescent. It has been shown that those adults who care about nature and have issues related to nature (nature conservation, etc.) have been involved in early childhood (Falgoust, 2007).

With the expansion of the tourism industry around the world, it has become necessary to determine the behavior of travelers and the need to travel outside their home country in order to plan and develop their offerings to specific audiences. Over time, several motivation theories for tourism have been developed, based on each other - Maslow's Hierarchy of Needs (1943), Dann's Theory of Push and Pull Motivations (1977), Travel Career Ladder (TLC) (1988), Travel Career Patterns (TCP) (2005) (Yousaf, 2018). The main factors influencing motivation are age, education, social status, mentality, religion, income, marital status, employment, health and physical fitness, geographic location, group size with which the individual wants to go in the wild, seasonality, chosen type of recreation (active or passive), cost, lack of time, health restrictions, lack of interest, safety aspect, knowledge, etc.

The Y generation, or millennials, is a technology-driven and a success-oriented generation. Requires recognition in all walks of life, is socially active, has a high self-esteem and self-confidence, is able to combine work and private life, often changes jobs. The Z generation, or iGen, is a generation that has grown up and is constantly connected - online, living through the virtual world. Featuring the motto: "Live here and now!", so they are very happy to share personal adventures and life events on social media. Therefore, the purpose of this study is to explore motivation and influencing factors for young people to visit the North Vidzeme Biosphere Reserve.

This paper reports the results of a study of the behavior of millennials towards biosphere reserve in Latvia (target audience 15-25 years old youth). An online survey was conducted for data collection. A quantitative approach was employed to analyze the data. Findings showed that most of all respondents have been visited North Vidzeme Biosphere reserve and are highly motivated by push and pull factors, like culture, relieving stress, escaping daily routine, gaining new knowledge, activities in nature and opportunity to socialize. Almost all respondents agreed that there was a lack of advertisements and visibility of area, but would be more motivated to visit biosphere reserve, if they would see that their friends are visiting it and posting beautiful photography's in social media.

Realist Theory in the 21st Century: An in-Depth Analysis of Realism Validity Since the End of the Cold War

Ian Bain, Slippery Rock University

Faculty Sponsor: Pragati Rawat, Ph.D.

On October 16th, 1962, the world found itself grappling with the idea of complete and total annihilation of humankind. The Cuban Missile crisis was a symptom and effect caused by a long brewing rivalry between the United States and the Union of Soviet Socialist Republics. After the fall of Hitler the US and USSR found themselves the leading powers militarily, and thus the only two world superpowers left standing. This created a power struggle between the two states as each state jockeyed to become the global hegemon of the New World. The stage was set, Capitalism vs. Communism, with the belief only one could be the inevitable victor. How this victory was going to be achieved was clear, another mass war was going to occur to protect the ideology of the state and thus grow its interest. Upon the inevitable belief of war the arms race began, and thus the Cold War was born. The explanation for such occurrences was simple, a state could only truly protect itself through militaristic strength, and the ability to defeat all enemies of the state on the battlefield.

This structural belief was morphed, shaped, and eventually became a theory regarded as Political Realism. Fast forward to December 26th, 1991. All eyes shockingly, and unexpectedly watched as Premier Mikhail Gorbachev lowered the Flag of the Union at the Kremlin, for it never to be raised again. No shots had been fired, the US and USSR had not seen direct conflict, no nuclear warheads had been launched, and it appeared peace had finally prevailed. According to Realist Theory this outcome was impossible. A global hegemon was to only be selected through conflict. Yet, this did not occur, and many proclaimed Realist Theory had been falsified. Today the world finds itself once more spiraling towards conflict as the states of China and North Korea continue to rise. Thus, the question is to be asked, did the Cold War really falsify Realist Theory, or was this outcome an outlier in the inevitable cycle of human conflict, and domination.

Do Tattoos Affect Preference for Gender?

Carly Biebel, Penn State Behrend

Faculty Sponsor: Wilson Brown, Ph.D.

Tattoos have become more acceptable and popular amongst both men and women in contemporary society. According to the Pew Research Center, approximately 38% of millennials have tattoos, while 32% of those between the ages of 30-45 (Gen X) reported having tattoos. Tattoos can be found across both genders, with females now getting about the same number of tattoos on average as males even though expectations for men and women with tattoos in the United States may differ. Males with and without tattoos, and females without tattoos are generally perceived more favorably than females with tattoos (Boultinghouse, 2015). Still, a stigma against tattoos may persist based upon an individual's. The current study will examine the relationship between preferences for tattoos and gender, with a specific emphasis on a possible stigma against women with tattoos. Participants will include approximately 70 students from Penn State Behrend who are recruited through the university-specific research subject pool. Participants will be shown a series of randomized vignettes that present two pictures that vary based on gender (i.e., male or female) and tattoo presence (i.e., with or without). For each comparison, participants will rate their preference for one of the pictures and their initial comfort level with each pictured individual. Participants will then complete a post-task assessment that includes queries about the tattoo history for each participant. A series of between-subjects ANOVAs will be utilized to examine the interaction between participant gender and ratings of each vignette. The researchers hypothesize the following: 1) women without tattoos will be favored more than women with; and 2) women with tattoos will be favored more than men both with and without tattoos. Some limitations to this study may include the facial expression of the pictured models, as the neutral expression of the male model may appear to be more negative or aggressive in valence than the female model. The difference in how neutral expressions of male and female faces are perceived may subtly influence participant ratings. Implications of the current study include; older participants may give a higher rating for the individual where the younger participants may give a lower rating.

Gender Identity Development in Children Caused by the Caregiver

Tammy Bissonette, University of Pittsburgh at Bradford

Faculty Sponsor: Helene Lawson, Ph.D.

In this study, I aimed to analyze the effect that a caregiver has on their children when determining their gender after birth. Additionally, what the child identifies with when they become adults. As well as to determine the relationship between the items given (toys, clothing, television programs). My research focuses on examining the interaction between the child (past to present time adulthood) and the caregiver. The sample included 22 students from the University of Pittsburgh Bradford campus, freshman class. The sample included 6 males and 15 females, ages 18-22). I found that the items in gender themed toy that was given and the interaction of how each student was raised, is an indication of what made them identify with a certain gender as an adult. The expectations that were stated in the survey presented a clear view

on how each student was raised by being in a heterosexual home and needed to act and look according to the gender given at birth.

The second study that was conducted was through the interviewing process. I interviewed four participants ranging in age from 18- 54 years out of the ten. The other participants were not willing to have their results shared. I was able to justify the same conclusion based off the survey and result data collected that the caregiver was a factor of what the subjects chose for the gender as they went into their teens and onto adulthood. Due to not being able to locate individuals with a gender-neutral mind-set, most of my articles, research, surveys and interviews all have coincided with one another. From the research that was conducted, I believe that the caregiver determines the gender for the child. The interaction and items that are chosen has determined what standards the individual will follow into adulthood.

Long-term Effects of Childhood Sexual Abuse

Victoria Cian, University of Pittsburgh at Bradford

Faculty Sponsor: Helene Lawson, Ph.D.

Childhood sexual abuse is one of the most unclear problems in families. The number of families affected by sexual abuse is heart breaking. According to the American Association for Marriage and Family Therapy, 2012, one out of four girls and one out of five boys are sexually abused by the time they are eighteen years of age. Child abuse occurs at every socioeconomic level, different cultures, and at all levels of education (Swam, 1998). This paper focuses on childhood sexual abuse before the age of eighteen and what the long-term effects are, based on childhood sexual abuse. Using interviews and open-ended questions the study finds that long-term effects of childhood sexual abuse on individuals, such as PTSD, anxiety, etc. This paper, also, studies relationships of the sexual abused in their futures and if the relationships are affected or not.

Data-Oriented Technology Stack (DOTS) And the future of video game engineering.

James Crescenzi, University of Pittsburgh at Bradford

Faculty Sponsor: Ken Wang, Ph.D.

Standard video game engineering commonly uses Object-Oriented Programming (OOP) to create gameplay. These gameplay mechanics are often achieved by attaching scripts to gameobjects, which then operate logic on the gameobject dependent on the game state. This allows for complex and dynamic gameobjects in games. Unity, one of the most popular game creation engines (along with Unreal Engine and CryEngine), uses OOP as its main form of development. Unity Technologies has taken steps to simplify the amount of development required to make a full production video game. These simplifications have also made it easy to write unperformant code.

Complex game objects take up a large amount of memory and cpu resources, which leads to technical hurdles, such as massive framerate drops when a large amount of gameobjects are instantiated into the game state. Unity Technology and Havok are working on a solution to this problem: The Data-Oriented Technology Stack (DOTS). DOTS differs from OOP in how it handles game logic, operating on one part of many gameobject at once, rather than all parts of one gameobject. This is possible because of three tools Unity Technologies is working on: Entity-Component Systems (ECS), the Job System, and the Burst Compiler.

ECS is Unity Technologies' alternative to gameobjects. ECS is comprised of Entities, which are lightweight data containers containing pointers to data containers called components. Components, which are structs that contain simple data used by systems. And Systems, which operate logic on arrays of components en masse. These three things make up ECS and allows for thousands of entities in place of dozens of gameobjects. The

Job System is Unity Technologies' solution for making multithreaded code more developer accessible. It creates a format baseline for "Jobified" code, eliminating the possibility of an engineer creating a race condition or deadlock through correct code architecture. This creates a strong synergy with ECS and component arrays, allowing for tens of thousands of entities to take the place of dozens of gameobjects.

A university project is currently being developed using Unity Technologies DOTS framework, with the end result being the foundation of an RTS engine. The goal of this project is to show the amount of performance DOTS can give when an engineer who is used to OOP migrates to DOTS. Conclusions drawn from this project are anticipated to be high performance for a large amount of complex agents, ease of access for learning DOTS, and the ease of dealing with scope bloat and reworking old systems with the modularization of Components and Systems. The fifteen-minute oral presentation will include an overview of DOTS, accompanied by slides from the student project for clarity.

Sentence Compression Using Emoji Summarization

Alexander Day and Chris Mankos, Clarion University

Faculty Sponsor: Soo Kim, Ph.D. and Jody Strausser, Ph.D.

Automatic text summarization is a category of algorithms that aim to produce a small set of representative information from a larger input document. There are two general categories of automatic summarization: extractive and abstractive. Extractive summarization uses sentences and phrases that are already present within the document in order to produce an outline. While this method can produce representative summaries, it does have the drawback of limiting the vocabulary that can be used in the summary. On the other hand, abstractive summarization tries to understand the information within the document and summarize it by creating new phrases and sentences. In our previous research [1], we have implemented two extractive summarization methods: Term Frequency-Inverse Document Frequency and TextRank and presented the results of running the algorithms on three different corpora: Moby-Dick by Herman Melville, a selection of Reuters news articles, and a selection of posts on Reddit. In this research project, we aim to explore more abstractive methods for summarization. In the domain of Natural Language Processing (NLP), there has been a recent shift to abstractive summarization. The most probable cause of this shift is the development of word embeddings [2]. Word embeddings allow machines to produce representative, fixed-length vectors from single tokens, words. This was a massive breakthrough mainly because many machine learning algorithms take a fixed-length vector as their input. Most previous attempts of word embeddings were lossy or produced vectors of an unwieldy length. Another benefit of this vector representation is that it allows a direct numerical comparison between the words. This work has been expanded from words to both emoji [3] and sentences [4] in our research.

Our project aims to tackle abstractive summarization in a new and novel way by compressing a sentence into a series of emojis. Emojis are a pictographic language that is commonly used on the internet and within text messages. In the latest emoji standard, there are 2,823 characters. The motivation for using emojis was twofold. First, emojis are very information-dense. Thus, this allows us to compress large chunks of the sentence into just a single emoji. Second, emojis have no formal grammar. This cuts out a large issue with most neural machine translation in, so we can focus on the adequacy rather than the fluidity of the produced translation. There are two possible uses for our algorithm. First, producing a summary of a document using emoji could prove to be a quick way to let someone decide if this topic is interesting to them. Second, it could help with the understanding of emoji on social media platforms by going backwards from a series of emojis to a sentence. The algorithm devised develops a sentence translation in three discrete steps. In the first step, the sentence is split into a combination of n-grams. N-grams are chunks of the input sentence comprised of words that appear next to each other. For example, one n-gram from the sentence "Rock music approaches at a high velocity" could be "Rock music". In the second step, these n-grams are transformed into their vector representation. In the third step, the emoji with the closest vectorized description is chosen to represent that n-gram. By combining

these emojis together, a predicted translation is produced. The results are shown below: Table 1: Input sentence and corresponding output emoji from our algorithm

| Input Sentence | Output Emoji |
|--|--------------|
| Rock music approaches at high velocity. | 🎵 🎸 🎧 |
| Christmas music rings from the clock tower | 🎄 🎵 🎸 🎧 |
| It isn't perfect but it is a start | 👤 🎵 🎸 🎧 |

We have devised an n-gram grouping algorithm that predicts an emoji sequence based on an input sentence. The results of this algorithm have not been formally verified due to the lack of scoring techniques. However, empirical evaluations of the results have been positive.

Hispanic Heritage in the Modern World

Zina Fitzpatrick, University of Pittsburgh at Bradford
Faculty Sponsor: Helene Lawson, Ph.D.

It is not uncommon for three generations to live in the same household or nearby each other. Grandparents typically play an important role in their grandchildren's upbringing. The focus of this research is to maybe share a bit of family culture and understanding on what keeps the Hispanic culture so strong. Understanding the Hispanic culture is very important; how the Hispanic population function and perhaps learn about the social trends that have the strongest impact on Hispanics. I hope to shed some light on this subject through private and secure online media surveys that were conducted and collected by different age groups. I hope this research is helpful. The Hispanic culture is a very beautiful and I hope to share my findings with you.

Media Influence on Election in US

Chance George, Slippery Rock University
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In United States politics, the media has a large audience when it comes to discussing politicians who are running for office. Voters tend to be persuaded by the media on who the best candidate is, and which candidate has the most important views. Considering the two biggest sources for politics in the United States are CNN and Fox News, this gives the voters the choice to learn about either Democratic or Republican candidates. This also means both sources can choose who to favor and what to say about certain politicians. Thus, leaving out the other potential candidates who which might not fit the media sources views, most likely to always leave out third party candidates. Social media also plays a huge role when it comes to discussing politics because most of the youth today are always on social media rather than reading a newspaper or watching the news. Newspapers tend to push candidates in which they believe would benefit their town, city or state. This leaves voters thinking the best candidates are being pushed by the source of media they tend to view. When it comes to media reviewing these politics, how does media influence elections in the United States? This topic is important due to the majority of voter's views and opinions being based off what their media source says. The media can leave out certain candidates, therefore lacking potential and vital information about other politicians. The media also tends to only point out negative viewpoints of the opposing party, the one they do not favor. Media plays a huge role when it comes to people's opinions and the information they learn.

Is the American Institution Empowering its Citizens to be Controlled Racists?

William Graves, Hilbert College
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The discussion of critical race theory through American literature and poetry has opened many people's eyes to the torture that African-Americans have suffered through in the short history of the United States. Most would want to believe that America has changed for the better in our ideology of racism and the treatment of others.

Though the question truly is, has society become less hateful than it was a century ago? One can come to understand the recent trend of increasing racial tensions by looking at the systemic origins of racism in the United States, and that “The Lynching” provides a cultural benchmark at the climax of some of our most violent treatment of Americans in history. In looking back on our hate-filled history, can we find hope for a more accepting future?

Claude McKay’s journey to America came during a very volatile racial time period that was politically endorsed and legally enforced across much of the country. The writing of “The Lynching” portrays a society that has no problem viewing the body of a recently lynched young man. The most tragic aspect of it is the “lynchers that were to be” and the freedom they had to play around this dead body. In *Stamped from the Beginning*, Ibram X. Kendi describes the backing of racism in American history: “Hate and ignorance have not driven the history of racist ideas in America. Racist policies have driven the history of racist ideas in America. And this fact becomes apparent when we examine the causes behind, not the consumption of racist ideas, but the production of racist ideas” (Kendi 9). When we are being fed racist ideas through the institutions that govern our country, our chance of escaping these influences is limited.

While many people act out of individualized racism which reflect their own beliefs, many of our actions may also come from reports by various government agencies. “Institutional racism...is less overt, far more subtle, less identifiable in terms of specific individuals committing the acts. But it is no less destructive of human life. [It] originates in the operation of established and respected forces in the society, and thus receives far less public condemnation” (Gillborn “Critical” 9). We are required to filter every piece of information that flows to us and decipher the true message that is being pushed out. If we do not take this action then we can become susceptible to allowing them to control our actions towards or responses to those that differ from us in any way.

Through the review of many peer reviewed articles, I conclude that racism is continuing in America because of institutional directives that enable others to suppress those perceived less than them and not enabling change in circumstances to occur.

Assessing Social Media Impact Using A/B Testing

Joey Kerle, Clarion University of Pennsylvania

Faculty Sponsor: Nripendra Singh, Ph.D.

Great Deal Tires, an online tire company, wants to learn more about how individuals interact with its Facebook page posts. In this case study, Tableau, Facebook Analytics, and Facebook Insights was used to help Great Deal Tires better understand how individuals interact with its Facebook page. Tableau was used to show the top performing posts and how the engaged users of the Facebook page changed over time. Facebook Analytics and Facebook Insights was used to gain more information about the audience.

A/B testing was used to assess the social media impact on users. A/B testing is an experimental approach to finding what users want. This technique allows for situations where users use new features in unexpected ways. This enables to learn about the diversity of users, and appreciate their different approaches and views of Facebook. By using these tools, Great Deal Tires will be able to better target individuals in the future, including what messages resonate with their audience and the best times to post.

Positive and Negative aspects of Immigration and Assimilation in the United States

Lester Perry, University of Pittsburgh at Bradford

Faculty Sponsor: Helene Lawson, Ph.D.

This research examines the positive and negative aspects of Immigration and Assimilation in America. I discuss to what extent the American culture has influence on the African in the diaspora. It will explain my own experience and my family's experience when we left our home country to come to the United States. I discuss my family experience as an immigrant in the United States and why African parents assimilate to the change within the American culture and distance themselves from the usual way African parents raise children in Africa.

I elaborate on the challenges African parents face in order to assimilate into American culture. I conduct interviews and find literature on problems of assimilating into a new culture when people travel out of the country of their own. Moreover, I discuss why African parents change the disciplinary parenting style that they were brought up with in African. I will also discuss my family's experiences as immigrants in America and explain how African parents raise their children in Africa and America.

Alcohol Consumption, Impulsivity, & Living Situation in Relation to Sexual Assault on College Campuses

Morgan Shatto, Penn State Erie - The Behrend College

Faculty Sponsor: Wilson James, Ph.D.

While drinking alcohol is a common experience among college students, alcohol may act as a risk factor for sexual victimization, especially for women. By research indicates that 80% of women in college have reported experiencing some form of sexual violence (DeMaria et. Al, 2018). However, the additional factors that contribute to the relationship between alcohol consumption and sexual victimization in college-aged women remain unknown. Factors of interest include impulsivity and living situation. The current study will examine how alcohol consumption, impulsiveness, and living situation may influence the likelihood of experiencing some form of sexual assault. More specifically, the following are hypothesized: victimization will be positively associated with alcohol consumption and impulsivity, alcohol consumption will be positively associated with impulsivity, and living situation (i.e., campus dormitory, off-campus apartment, Greek housing) will predict the experience of sexual victimization. The current study will initially include Penn State Behrend students, then it will be open to all Penn State campuses. Participants will complete measures of demographic variables, alcohol consumption, impulsivity, sexual victimization during college, and living situation. To examine the relationship between continuous predictor variables (i.e., alcohol consumption, impulsivity) and sexual victimization, a linear multiple regression analysis will be utilized. A one-way ANOVA will assess the relationship between living situation and sexual victimization.

Limitations that may occur are under or over reporting alcohol consumption and a small sample size that may decrease external validity. Implications of the current study includes beneficial information in seeing what factors may or may not lead to a higher risk of sexual victimization.

The Crisis in Social Security

Logan Summerlin, Slippery Rock University

Faculty Sponsor: Pragati Rawat, Ph.D.

One of the largest programs that the federal government operates in the United States is Social Security. With Social Security's budget currently at \$1.5 trillion and expected to grow to over \$2 trillion in the next decade, it makes up a third of the entire federal government's budget (Congressional Budget Office 2018). Currently, 68

million Americans are using either Social Security retirement benefits or are using the disability benefits (Martin, P. P. 2005). In addition, more than half of all households in the United States have at least one person that is receiving some form of Social Security (Cogan J. F. 2017). Even though this is a massive program that takes up a large part of the nation's budget, very few people understand just how the program works and how it came about.

The author finds that the group theory policy model best fits the history of Social Security. Veterans groups, the elderly, and the working poor were all groups that formed the coalition that fought for social insurance in the United States. Organizations like The Grand Army of The Republic and AARP have been formed to affect change on social insurance legislation.

Although the program is very large, the mechanics underneath the hood are very simple. Throughout your working life, you as an employee pay a payroll tax of 6.5% on every paycheck. Your employer also contributes 6.5% of your paycheck in the form of payroll taxes. This money is collected up to a cap of 127,000 dollars. The government then takes the money you send them and provides Medicare and Social Security benefits for seniors. When you reach the age of retirement, usually 67, you can begin to withdraw social security benefits. You can, however, receive a lower benefit and retire as early as 62. The government decides your benefit by looking at the average of your 35 highest earning working years.

To further understand the program, you must go back into its history to see how it came about. Social insurance programs have a long history going back to Germany in the 1880s when Bismarck created a social insurance program for the elderly. The liberal and socialist parties in parliament were rabble-rousing for a new social insurance program to address the destitution of the elderly. The elderly were being cast aside during their working years and had no way to feed their families.

In the United States, Social Security grew out of the Great Depression. Unemployment varied wildly at certain points of the early 20th century with variations between 1920-1924 of 4% to 19% and 4% to 16% from 1905-1909 (Soneji, S., & King, G. 2012). These cyclical changes in the economy hurt the poor and the elderly the most and caused calls for more social insurance programs. States set up their own insurance programs but they were small and not well funded. There needed to be a national solution to the problem of poverty of the elderly (Martin, P. P. 2005). Following the economic crisis of the early thirties, there was an opportunity for great political change. The administration of FDR was given a strong electoral mandate and immediately got to work writing policies to address destitution due to old age. His plan faced extreme opposition from conservatives late in the decade which led to the 1939 amendment cutting benefits slightly (Martin, P. P. 2005). There was a debate at the time among politicians about whether or not a reserve or surplus should be created in good times to provide benefits for the future recipients. The conservative Congress decided against building a reserve and payroll taxes were frozen during the strong economy of the interwar period. (Martin, P. P. 2005). The study concludes that the group theory policy model best describes the policy process of Social Security. The massive interest groups of retirees, the disabled, and the widowed control the political process with regards to Social Security. To fix Social Security, the United States should lift the cap on payroll taxes and increase the retirement age to 69. That will ensure the long-term solvency of the program.

Public Policy As It Relates To People with Disabilities

Michaela Sykes, Slippery Rock University

Faculty Sponsor: Pragati Rawat, Ph.D.

According to the United States 2010 census about 56.7 million people, 19% of the population, are living with a disability. That means about 1 in every 5 people has a disability (US Census 2010). Individuals with disabilities are a minority group and like other minority groups in America they too have had a civil rights movement to advocate for and guarantee their rights.

Individuals with disabilities have faced many challenges relating to the protection of their rights. Individuals with disabilities have been around since the beginning of time, but they have not always been treated kindly by society. Prior to the late 1900's when self-advocacy started to emerge, there was an "out of sight, out of mind" belief when it came to people with disabilities. They were often locked away in institutions or stuck inside their houses, typically not living independent lifestyles. After the major civil rights movement of African Americans, people with disabilities seemed to find their voice and adopted some of the same non-violent protest techniques previously used by African Americans. There was a huge push for self-advocacy as people with disabilities began to show the United States that they exist and debunk the stereotypes surrounding them being helpless. With that push and some advocacy groups that participated in lobbying we finally saw congress create legislation with the intent to protect the rights of people with disabilities. (Mayerson, 1992) Now we must ask the questions, how have the policies for people with disabilities changed overtime and what policy model best applies to this policy field.

Motivation, Experience, and Satisfaction from Religious Event: Kumbh Mela

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Tourism has numerous motivations ranging from leisure time to highly stratified goals and missions. Similarly, tourist destinations have varied attributes ranging from adventurous to religious or spiritual. Some of the destinations have a blend of different attributes providing a set of offerings and varied experiences for tourists. Tourists select a particular destination based on his/her motivations and accordingly develop expectations. Considering the set of motivations that lead to selection of destinations there can be various categorizations. Though there is abundance of scholarship in the area of religious tourism, there is little empirical work in context of the motivations, expectation, and satisfaction of tourists visiting religious destinations. This study will address this research gap by analyzing the tourist motivations, expectations, actual experiences and overall satisfaction of various religious destinations and gatherings in India. Religious beliefs have been one of the earliest motivations behind tourism (Rinschede, 1992). Religiously motivated or pilgrimage tourism have become one of the most persistent motivations behind touristic choices in the recent times (Nyaupane, Lew, & Tatsugawa, 2014). Religious tourism can be broadly defined as the tourism whose most dominant motivating factor is religious beliefs and faith. Religious destinations and gatherings have been gaining some record figures in terms of tourist footfalls and magnitude. According to the United Nation World Tourism Organization (UNWTO) the number of pilgrims visiting the world's key religious sites every year ranges from 300 to 330 million (UNWTO, 2011). In India, Kumbh mela and Dev deepavali are the two religious events that attracts millions of tourists (Shinde, 2008). Kumbh being the largest of all religious gatherings according to the Guinness Book of world records, as per a report by NDTV (NDTV, 2019).

Religious Tourism: An Agenda for Research on Destination India

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Celebrations do not necessarily need a reason. It is the yearning to be with your loved ones. The whole world celebrates the joy of festivals in different forms. People get-together on various other occasions and purposes such as marriages, birthdays, and religious events both at home and at a tourism destination. India is known to be a global religious destination in many ways, and religious events are cherished by all people irrespective of gender, age etc. India shows the image of living natural life in its form as provided by mother Earth. For times immemorial, India has been showcasing the essence of humankind. India is known to be one of the oldest civilizations in the world having first accumulation of material wealth and large population of thinkers and

intellectuals (Sharma, 1968). This research note provides an overview of the research that is planned to be pursued in next 3 years.

The research will be concentrated on exploring the Indian religious touristic destinations because of its uniqueness and vast potential. India is branded as a potential destination of religious tourism for people across the globe being home to numerous religions and faiths. India, a nation with more than 1.3 billion population (Worldometers, 2019) celebrates number of religious events with mass gatherings from time to time. For example, The Guinness Book of world records glorifies the Kumbh Mela (or Kumbh) in India to have the most number of people (more than 20 million pilgrims), assembled on any one day (January 30, 2001) for a common purpose at one religious destination, Allahabad in India.

There are numerous motivations behind religious tourism, oscillating from free time to specific goals. Religion significantly influence the particular behavior regarding travel and tourism (Levin, 1979; Mattila, Apostolopoulos, Sonmez & Sasidharan, 2001). There are certain motivating factors that help in decision-making for a particular tourist destination. For the past few decades, religion has become the main source of motivation to visit touristic destinations (Nyaupane, Lew & Tatsugawa (2014). Religious pilgrimage is more popularly known as “Tirth Yatra” in India (Shinde, 2007). Different destinations in India have their own distinctive religious significance and factors of attraction. Most of the tourism to Indian religious destinations are known to be motivated in pursuit of attaining Moksh as these destinations are known for helping people to attain moksha like *Kumbh*, ‘*Char Dham*’, ‘*Snans*’ (taking dip in holy water of Ganges) at Rishikesh and Haridwar. India, being the mother of four religions, Hinduism, Jainism, Sikhism and Buddhism, has almost the same concept of Moksh in all of them. In simple words, Moksh refers to freedom from the cycle of birth and re-birth. In religious words, it refers to emancipation, enlightenment, liberation and release. The Indian holy book, *Bahdwadgita*, defines Moksha as freedom from the birth-rebirth cycle, freedom from ignorance and attainment of real knowledge by virtue of union with self, actualization and realization of self and ultimately reunion with the almighty (God). The term has many synonyms in Indian religious literatures like Nirvana, Kaivalya and many more. In Buddhism, this is known as Nirvana which is referred to as a secular path to get rid of the mortal cycle of suffering (Hall, 2006). But people from diverse backgrounds, in context of religion, age groups and communities, have different motivations and perceptions for a religious destination, as some people visit religious destination for attaining salvation, moksha, nirvana while some for recreational motives while others for a bunch of different reasons. Studying different motivations to attend religious events is the area of research in this agenda. Some other questions in this agenda that needs to be answered include “what are the additional motivations apart from the specialty of a certain religious touristic destination that make people visit a certain religious destination”. At the same time, there are certain less religiously motivated visitors who visit the religious destination to explore the religious festival while some visit for recreational purpose (Shinde, 2008). Hence, the other question that needs to be addressed is “what do the visitors of a particular religious destination actually search for during their visit”.

Multicultural eating habits and its effects on society

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Our team will be conducting research in order to compare and contrast eating habits between several different cultures, Benelux, Morocco, and the United States, and how those habits can lead to obesity. We will also be reviewing the impact of advertising and marketing on consumer choices and consumption. We will be conducting a survey, which we hope will provide insight into consumer eating choices and details on how current marketing is distributed between these cultures and if there is any link to overconsumption. A culture that prioritizes being “physically fit” over a culture that doesn’t care about “a little extra weight” will respond better to commercials that reflect these lifestyle traits concerning body physique.

This research should have an impact on food marketing in many ways. When talking about marketing, it is important to consider the components of the marketing mix (Chandon & Wansink, 2012). Intended for this research, the marketing mix describes the food marketer's perspective. This mix consists of 4 P's, promotion, price, product, and place. The promotion component is part of marketing communication of a company, such as advertising. Advertising is not the same in every country or region. When comparing the Benelux and the US, North American advertisements mostly consist of storytelling while European brands and companies try to embed their unique selling proposition in ads (Knight, 2014). This means that global marketers need to take these differences into account if they want to reach a lot of people. Next to promotion, price is also an important aspect. According to experts, the price of products is linked to obesity, meaning that lower pricing leads to an increase in consumption (Chandon & Wansink, 2012). Finally, product and place, also affect eating habits and obesity in different countries. Having easy access to foods, which are higher in fats and processed ingredients seems to contribute to higher rates of obesity.

The comparison concerning eating habits and views on obesity in Benelux, Morocco and the United States starts by explaining the difference in food regulations in these regions/ countries. The main difference between Benelux and the US is that European food regulations are much stricter than regulations in the US. Especially additives that are shown to be related or might contribute to cancer are being banned in the EU while food processors still use them in the US (Rabin, 2018). Being a country predominantly Muslim, food regulations in Morocco are even more strict because of the Halal food standards. Halal food is permissible food that Muslims can consume and should follow certain Islamic dietary regulations (University of Toronto, 2019). There are also agreements between the US and the EU that state the importance of beef coming from animals that were not treated with hormones (Council of the European Union, 2019). Apart from regulations, food availability also plays a huge role in eating habits (Mitchell, 2004). While food availability differs from country to country in Europe, studies show that consumption of meat is higher in the US and that there are more sweeteners available compared to Europe, however less animal fat is available in the US. Considering eating habits can have effects on obesity, it is important to study this topic. In order to relate obesity to productivity, it is crucial to review how obesity is being determined. Obesity can be measured by using the Body Mass Index, also called BMI (CDC, 2017). In order to calculate this index, height and weight are being used to indicate a person's body fat. When the BMI is 30.00 or more, a person is considered to be obese. The global increase in obesity has consequences regarding the costs of healthcare (NCBI, 2017).

One study revealed that costs concerning healthcare in the United States in 2008 were higher than the costs related to obesity in Benelux. This may have a direct impact on whether or not people can afford to have healthcare that allows them to control their obesity. Concerning the other effects of obesity, studies relate obesity to absenteeism, which means it affects productivity and performance in the workplace. Another study shows that obesity is more common in the US compared to countries in Benelux: the Netherlands, Belgium, and Luxembourg, while obesity is also common in Morocco (World Health Organization, 2019). Finally, trends also indicate that people living in urban areas are more likely to be obese compared to people in rural areas (Springer US, 2014).

Our research will be conducted using classical survey methods. This will be done by each individual in the group contacting their peers from their home country. The surveys will be conducted using an online survey website, thus allowing a link to be sent via email or an instant messaging platform. The data collected will then be compared and used to find or show any relationships between the different geographical regions', United States, Benelux, and Morocco eating habits. The survey will consist of around 30 questions that focus on eating habits and how those habits may affect a person's thoughts about themselves or others in terms of obesity or productivity. The demographics that we will focus on include age, gender, income, and geographical region. We are hoping to find a difference in eating habits between the nations and find that those differences relate to obesity rates in each nation. We hope to uncover important insight that marketing and advertising have on consumer choices. It is our goal to extract data from our survey responses and provide recommendations that

could contribute to healthier eating and how brands could be more proactive in its marketing and advertising messages towards consumers. These findings could be especially beneficial for brands, such as fast food, dine-in restaurants, or take-out establishments.