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APRIL 24, 2020
UNDERGRADUATE
RESEARCH
SYMPOSIUM

URS

DIGITAL SHOWCASE

University of Missouri
St. Louis

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Culture Under Quarantine in St. Louis During the Pandemics of 1849, 1918 and 2020

by Gauri Babu, John Hallemeier, Krystyna Nicely, Lakota Schmidt, & Emma Zilke

Faculty Advisor: Dr. Susan Brownell

Father's Profession Predicts Academic Outcomes for Women in STEM

by Christopher Bach

Faculty Advisor: Dr. Bettina Casad

The present study tested a predictive relationship between father's profession and academic outcomes for women in science, technology, engineering, and mathematics (STEM). Undergraduate women majoring in STEM (N = 688) completed an online questionnaire measuring variables relating to expected success in STEM as well as sense of belonging in STEM and gender attachment and indicated their father's profession, which was coded as STEM or non-STEM. Women without a father in STEM experienced higher levels of sense of belonging in STEM, academic self-efficacy, math performance expectations, and science performance expectations the higher their levels of gender attachment. There were no relationships among women with a father in STEM. It is likely that women without a father in STEM rely more strongly on gender attachment to impact academic outcomes than do women with a father in STEM as a father in STEM is a protective factor. Gaining a greater understanding of the ways in which sense of belonging and STEM expectations are influenced will help inform interventions that can lower the attrition rate for women in STEM.

The London 7/7 Attacks: A Government Push For Support For The Iraq War?

by Odette Beagrie

Faculty Advisor: Dr. Rob Wilson

London faced its most deadly terrorist attack on the 7th of July, 2005. Later to be known as the 7/7 bombings. On this day, four supposed suicide bombers took a train into London, where each proceeded to go their own routes on various tubes and one on a bus. They were in separate hotspots of London, where each of them triggered their suicide vests and bombed three tubes and one bus. 56 people died and 784 were injured. A conspiracy theory emerged from these bombings, in order to find who was really behind the attacks. With the main supposed perpetrator being the British government, with Tony Blair being prime minister at the time. The fingers were pointed at the government, due to the Iraq war that was on going. The attacks were a way for the government to garner more support for the ongoing Iraq war. Where, if the British public identified the Iraqi and Muslim people as the enemy, they were going to be more in favour of the war. Therefore, that is why the government was behind the attacks. There are sources that allude to this conspiracy and highlight all the anomalies. Such as the List Verse source that mentions 10 of the anomalies surrounding the event, with some of those anomalies being reiterated in the abc article. There is as well an article from The Guardian, that looks more into eye-witness accounts and peoples accounts of the events, again linking with the anomalies of the day. With these articles also shedding light that the government had a hand to play in the bombings. If the government had something to do with these attacks, either actively took part in them or turned a blind eye. It would cause a whole shift in the way the United Kingdom is structured, with a deep distrust of the establishment following. The knowledge that the

Undergraduate Research Symposium 2020

government would endanger its own citizens for their own political gains on the world stage, would cause mass chaos and rebellions.

The Denver International Airport: Hub of Flight or Hub of Fear?

by Sophia Bell

Faculty Advisor: Dr. Rob Wilson

The Denver International Airport has been a popular site of conspiracy since its construction 25 years ago. There are many conspiracies surrounding the airport and some seem to connect together. Some of the most popular conspiracies include believing the horse statue outside the airport is tied to Satan, the runway is tied to Nazis, the underground tunnels are run by the New World Order and occupied by the Reptilian Elite, and the artwork and decor is creepy so it has to be tied to the destruction of humanity. While conspiracy theories are either supported or adamantly debunked, this airport wants the public to have fun with the conspiracies. They don't support them by saying they are real. They deny them and provide the real evidence such as the origins behind the horse statue, the real reason the runways are that way, what the underground tunnels are actually for, and why the artwork and decor look the way it does. However, they provide signs, decor, and other promotions that keep the conspiracies alive and even add to them. Many theorists believe this behavior is actually a cover up for the truth as it provides the airport with more money and visitors due to its unique and exciting nature while securing the idea that the theories are just something fun to enjoy.

An Assessment of the Economic and Social Response to COVID-19 in St. Louis

by Cynthia Bishop, Jamie Kocinski, Ellen Schneider, Danielle Crosno, Baeyle Love, & Ashley Chilton

Faculty Advisor: Dr. Susan Brownell

Developing the Weldon Spring Interpretive Center: History, Public Health, and Ecological Engagement

by Molly Brady, Megan Derosier, Abigail Marshall, & Jordyn Watkins

Faculty Advisor: Dr. Susan Brownell

The Influence of Anhedonic Symptom Severity on dmPFC Connectivity in PTSD

by Nathan Buggar, Sally M. Pessin, Carissa L. Philippi, & Steven E. Bruce

Faculty Advisor: Dr. Carissa Philippi

Buggar, Nathan (UMSL-Student), Pessin, Sally (UMSL-Student), Philippi, Carissa, Bruce, Steven E.

This study examined resting-state functional connectivity (rsFC) of the dorsal medial prefrontal cortex (dmPFC) as a function of anhedonia in individuals with posttraumatic stress disorder (PTSD). Results showed that anhedonia positively correlated with hyperconnectivity between the dmPFC and the left retrosplenial cortex. These findings support that anhedonia is associated with increased rsFC within the default mode network (DMN) for PTSD.

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Benazir Bhutto: Death in a Sunroof

by Neeha Chaudhry

Faculty Advisor: Dr. Rob Wilson

Throughout history we have learnt about various important women. Many of them were heroes, who lost their lives for an important cause. Benazir Bhutto was also one of the few people who died a hero in her country, Pakistan. She was assassinated on 27th December 2007. When her car was bombed while she was in a rally, promoting her party for an upcoming election. She was also the first Lady to ever gain power in the Muslim world. She has been an inspiration for countless women across the country. Not only was she an amazing daughter, but she was also a wife, a mother and a phenomenal leader of a patriotic society.

Her death came as a blow and is till date unresolved. There have been many speculations regarding her death. Some say that the bomb was planted by the head of her Rival party Parvez Musharraf, who had earlier exiled Benazir and her family from Pakistan for a couple of years. Another speculation was that the Al-Qaida a group of extremist Muslims had planted that bomb because they were not happy with the freedom and rights she was giving to women and didn't want to be governed by a woman. The most shocking speculation out of them all was that her own husband had the bomb planted as he wanted power over the party and the following year, he also won the elections due to sympathy votes. The research paper will discuss Benazir's life, her motivations, goals, and the changes she brought to the country leading up to her still unresolved murder.

The Sinking of the Titanic: A Tragedy Disguised for Gain

by Allison Christman

Faculty Advisor: Dr. Rob Wilson

Even before the Titanic had set sail, it had been the center of attention all across the globe. Given the trait of being unsinkable, the Titanic was the largest ship during its time. Led by Captain Edward James Smith, the Titanic set sail on April 10, 1912 carrying roughly 2,220 passengers. Unfortunately, the ship had not completed its voyage, and on April 14, the ship hit an iceberg and began to sink. By the end of the tragedy, over 1,500 people had lost their lives. As the shock of the tragedy died down slightly, theories began to arise about the events that occurred. This ship was supposed to be unsinkable. To answer this question, many theorize that the Titanic was switched with its sister ship, the Olympic, just before the ship was set to depart for New York. The supposed switch was due to the fact that the Olympic had been in previous crashes and the company did not want anything to happen to its sister ship, the Titanic. Another theory is that a mummy's curse was the cause of the sinking tragedy. Supposedly, one of the passengers had brought the mummy onto the ship and began showing it to select passengers. The mummy brought misfortune to each person who owned it, and according to some was the cause for the accident. While there are several theories that people point at to explain the events that happened the night of April 14, the truth is still unknown to this day, and may stay that way forever.

Chronic Stress in Relation to Locus of Control

by Kendra Clark, Miranda Jany, & Carissa Philippi

Faculty Advisor: Dr. Carissa Philippi

Stress is prominent in everyone's lives, and if the right precautions are not taken, stress can become chronic and harmful to an individual's health (Schmitz, Neumann, & Oppermann, 2000). To prevent chronic stress, researchers seek to find out important factors that lead to chronic stress. One of the most prominent factors leading to chronic stress is locus of control (LOC), or how much control people feel they have over situations (Cummins, 1988). People can endorse an internal locus of control which means individual attributes events occurring in their life to their own behavior, or an external, which one would consider an outside force responsible for an event that occurred in their life (Bollini, Walker, Hamann, & Kestler, 2004). There are mixed results in the literature regarding different forms of stress and locus of control. Some results indicate that external locus of control is related to higher stress levels (Schmitz et al. 2000), some results indicate that a more internal locus of control is related to higher stress (Cummins, 1988), while others found no significant relationship (Bollini et al. 2004). For this experiment, researchers wanted to examine the relationship between type of locus of control and amount of chronic stress. It was predicted that those with a more external locus of control would be more prone to developing increased chronic stress in their life compared to those with a more internal locus of control. In the present study, UMSL students (n=81) completed the Life Stressors Checklist to measure amount of stress exposure, as well as the Locus of Control Scale to measure if participants had more internal or external locus of control. It was found locus of control did not affect whether someone was to develop increase chronic stress in their life ($F(1,79)=0.049$, $p>0.05$). Although a significant relationship was not found, it is still important that individuals learn to manage stress, because stress presents itself similarly, no matter which perception of control an individual possesses (Bollini et al. 2004).

Is There A Hidden Cure For Cancer?

by Zahrak Farese

Faculty Advisor: Dr. Rob Wilson

Cancer is the name given to a collection of related diseases. In all types of cancer, some of the body's cells begin to divide without stopping and spread into surrounding tissues. Cancer is a genetic disease that is caused by changes to genes that control the way our cells function, especially how they grow and divide. The Global Burden of Disease estimates that 9.56 million people died prematurely as a result of cancer in 2017. Every sixth death in the world is due to cancer. Basically, conspiracy theories are a way to try and make sense of the world that in that moment doesn't particularly make sense. The Big Pharma conspiracy theory is a group of conspiracy theories which claim that the medical community in general and pharmaceutical companies in particular, especially large corporations, operate for sinister purposes and against the public good, and that they allegedly cause and worsen a wide range of diseases. The idea that big pharma has a cure for cancer and is suppressing it so that they can maintain a profit is believed by as much as 27% of the American public according to a 2005 survey. The FDA, The Food and Drug Administration is using its power to shut down any forms of alternative competing medicine that would be more effective and cheaper than the established forms of medicine. The FDA is either ignoring them or outright actively trying to shut them down and

University of Missouri-St. Louis

stop people from using them. The FDA has power over the entire world, not just the United States. No natural compound has been put forth more often as a cure for cancer than marijuana. Scores of alternative medicine websites insist research has proven delta-9-tetrahydrocannabinol (THC) can kill cancer, but the mainstream media, government, and pharma industry are working together to suppress it, and punish dissenters. Marijuana has a proven pain-relief effect and has also been known to increase the appetite of people with cancer, or those going through chemo. Research shows THC slows or inhibits growth in cancer cells. Chemotherapy kills patients faster than no treatment. Chemotherapy and radiation are meant to kill cancer with cellular poisons, and as such, can have extremely harsh side effects. Chemo can be ineffective or even useless with some cancers and is extremely expensive. The Central Intelligence Agency (CIA) is also hiding the cure for cancer. The CIA is the Central Intelligence Agency is a civilian foreign intelligence service of the federal government of the United States, tasked with gathering, processing, and analyzing national security information from around the world, primarily through the use of human intelligence. The CIA has control over the United States so if they are hiding the cure everyone else should be hiding it too.

Pearl Harbor: A Day the Government Betrayed America

by Liv Fuller

Faculty Advisor: Dr. Rob Wilson

Terror struck the United States on December 7, 1941, when Japan orchestrated an attack on Pearl Harbor. Conspiracy theorists accused Franklin D. Roosevelt, President of the United States, of having prior knowledge about the bombing of Pearl Harbor. Before the attack, the United States and Japan attempted to establish peace, this is known as the 14-Part Message. However, because of a disagreement over the 14-Part Message, Japan concluded peace was no longer negotiable. Information was supposedly left out of the 14-Part Message and the attack occurred before Roosevelt received any warning. Conspiracy theorists question whether Roosevelt purposely ignored any signs or threats of the attack or simply lacked relative information. These accusations would swiftly be denied by the government and Roosevelt himself. Furthermore, conspiracy theorists question Roosevelt's intentions leading up to World War II and whether he had alternative motives, this is referred to as the Back Door to War Theory. Ultimately, conspiracy theorists and historians debate Franklin D. Roosevelt's motivation for the attack, his involvement, and why Roosevelt would allow the attack on Pearl Harbor to occur. Conspiracy theories about Pearl Harbor and Franklin D. Roosevelt's are capable of negatively impacting society, their beliefs, and trust in the American government.

Silver Salts-Mediated Benzoylation Of Carbohydrates Under Mildly Acidic Conditions

by Nicolas Forsythe, Samira Escopy, Yashapal Singh, & Alexei Demchenko

Faculty Advisor: Dr. Alexei Demchenko

When looking at biomolecules, carbohydrates represent a large group of macromolecules that play many important roles in the body. Carbohydrates provide an energy supply for organisms, but it is proven that they are also involved in a myriad of other processes and every major disease. For example, severe acute respiratory syndrome-related coronavirus 2 (SARS-CoV-2), which has recently led to a pandemic all over the world, uses its spike glycoprotein to bind to receptors and mediate virus entry.¹ To date, no effective treatments for the associated disease

Undergraduate Research Symposium 2020

COVID-19 have been discovered but understanding how SARS-CoV-2 enters cell provides valuable information for drug design. Chemical synthesis of carbohydrates leads to advancements in chemistry, offers excellent opportunities for experimental training in the lab, and paths the way towards carbohydrate-based drug discovery. The protection and deprotection manipulations with carbohydrates play essential roles in synthetic carbohydrate chemistry.² Using benzyl ethers as protecting groups for hydroxyls is a standard way of obtaining differentially functionalized building blocks in carbohydrate chemistry.³ Uniform benzylation of carbohydrates can be efficiently achieved, but it typically requires excess reagents and/or harsh reaction conditions.⁴ Methods for mild and regioselective benzylation are hardly available at all. Herein, we report the investigation of a new benzylation reaction that makes use of mildly acidic conditions. The main focus of this study is to identify suitable silver salts that would efficiently mediate this reaction and help to obtain high regioselectivity, excellent yields, and minimize side reactions.

Nibiru Cataclysm: An Oncoming Apocalypse of Cosmic Proportions

by Kathryn Grothen

Faculty Advisor: Dr. Rob Wilson

The Nibiru, or Planet X, conspiracy theory holds that the Earth will come to an apocalyptic end when this planet's orbit brings it into collision or close contact with Earth. This collision or close contact with Nibiru will spell the end for humanity. Conspiracy theorists who accept this theory believe that the National Aeronautics and Space Administration (NASA) is hiding the existence of Nibiru to prevent mass panic regarding its supposed upcoming collision or interaction with Earth. Nancy Lieder first put forth the conspiracy theory in 1995. Lieder claimed that an alien race known as the Zetans had given her a vision that Planet X would pass or collide with Earth in 2003, causing a cataclysmic magnetic pole shift on Earth. The year 2003 came and went with no visit from Planet X; however, other dates for this cataclysm have since been proposed. These dates include the end of the Mayan Calendar on December 21, 2012 and sometime in 2017. Nibiru has also been linked to Sumerian mythology by author Zecharia Sitchin, and this linkage has been accepted by Lieder and the Planet X theorists at large. The linkage between Sumerian mythology and Planet X holds that Nibiru is home to an ancient race of beings known as the Annunaki. The Annunaki are thought to be the creators of humankind who, upset with the failings of the species, have decided not to warn Earth of the upcoming cataclysm involving their planet, which is said to pass Earth every 3,600 years. Previous passes by Nibiru have been connected to biblical events, like the Great Flood. Despite the fact that NASA denies the existence of Planet X and the alleged upcoming cataclysm, the Nibiru Cataclysm theory still persists.

Israel's Animal Spies: A Glimpse into the Accusations

by Meghan Hruskocy

Faculty Advisor: Dr. Rob Wilson

It is possible to train animals to do extraordinary feats. Working animals are an everyday occurrence in modern life, from service animals to K9 officers. So, is it that far off to think a government could train animals to work as spies? This is part of the basis for a conspiracy theory that Israel is doing exactly such a thing: using animals as tools for espionage. The animals being

University of Missouri-St. Louis

accused of being spies cover a wide range of sizes and natural habitats, from squirrels to sharks. There are accounts and statements from several countries with a variety of reasons and evidence supporting the accusations, and there are also reasons and evidence supplied which may disprove the theory altogether.

HAARP: The Weather Machine that Caused Katrina?

by Cullen Landolot

Faculty Advisor: Dr. Rob Wilson

In recent years, there have been growing controversies surrounding the High Frequency Active Auroral Research Program (HAARP). Since its establishment in 1993, the government-funded research facility has dedicated its resources to studying the Earth's ionosphere. However, HAARP has also been the target of several conspiracy theorists, who claim that the facility can create and weaponize weather anomalies, even to the extent of artificially inducing Hurricane Katrina. This review focuses on several of those claims, investigating their scientific legitimacy in addition to their potential origins. Specifically, it also examines the works of Dr. Bernard Eastlund and the extensive history of weather modification practices within the United States. Could it be that HAARP is yet another link in a long chain of climate experiments? Could it be that the Bush administration concealed highly advanced technology, using the facility to engineer Hurricane Katrina and usher in a New World Order? As it turns out, those claims are not as baseless as they seem, and it will take a rigorous investigation to draw a firm line between fact and fiction.

John Lennon's Death: Mark David Chapman and the CIA

by Maddesyn Langley

Faculty Advisor: Dr. Rob Wilson

John Lennon is often remembered for his contributions to the music industry and for his time with The Beatles. His life, however, was much darker and more troubling than many realize. He was a political activist that promoted peace during a time of unrest. His music was chanted during anti-Vietnam rallies, he influenced the freedom of John Sinclair, and he spoke out against nuclear weapons. His life was unfortunately cut short on December 8, 1980 when he was shot and killed by Mark David Chapman, a renewed Christian. There is little doubt on the murderer's identity. Trying to understand why anyone would want to kill such a sought out musician and political figure is where the confusion lies. Some believe Chapman was angry about statements made by Lennon that dismissed religion. Others believe Chapman was just a psychologically disturbed individual. There is also a more disturbing theory that persists; the CIA was behind Lennon's murder. Some suspect they brainwashed Chapman into doing the killing. Lennon was a powerful figure that influenced protests and disrupted order. The government did try to deport him on the basis of a possession charge, and Lennon even reported that he was aware government agents were watching him. The U.S. government was not in favor of him, but would they take it so far as to kill him? Understanding the true motive behind John Lennon's murder remains unclear even to this day.

Undergraduate Research Symposium 2020

The Relationship Between Self-Focus and Anxiety

by Katie Leutzinger, Leah Reyna, & Carissa L. Philippi

Faculty Advisor: Dr. Carissa L. Philippi

Researchers have linked self-focus with multiple psychological disorders and forms of maladaptive cognition, such as anxiety and depression. Throughout their lifetime, around 33% of U.S. adults suffer from an anxiety disorder, making it the most prevalent mental illness in the country. Anxiety symptoms often co-occur with depressive symptoms, therefore depression and anxiety are often consolidated together in research scenarios. Past studies have shown a positive correlation between negative self-focus and depressive symptoms. However, with anxiety prevalence on the rise, it is worthy of attention independent from depression. This study will look at the relationship between anxiety and negative self-focus. Previous research has shown that anxiety is correlated with higher reports of self-focus, and more severe levels of anxiety are related to negative self-focus specifically. The present study examines self-focused responses on a language task in relation to anxiety. Additionally, this study will consider whether depression mediates the relationship between anxiety and negative self-focus, which has yet to be analyzed in the literature. The Sentence Completion Task (SCT) is an open-ended language task that typically provides participants with beginnings of sentences, known as "stems", and participants then complete the sentences in ways that are meaningful to them. Responses to the SCT are coded for focus (e.g., self, other, both, or neither) and valence (positive, negative, or neutral). A sample of 188 college students were recruited to complete the SCT and the Beck Anxiety Inventory (BAI). This study predicted that (1) a positive correlation exists between anxiety symptoms and amount of self-focus, (2) negative self-focus is related to higher anxiety levels, and (3) there will be a strong correlation between anxiety and negative self-focus once depression is controlled for. Interestingly, our results showed that anxiety did not correlate with self-focus ($r(155) = .121, p = .130$) or negative self-focus ($r(155) = .071, p = .375$), which does not support findings from previous studies. Since the results from our first two hypotheses were not significant, we did not test the correlation between anxiety and negative self-focus while controlling for depression. This study discusses possible reasons behind the non-significant findings, and suggests that future research could evaluate if anxiety has a strong relationship with external-focused attention.

Mystery Mutilation: The Case for Alien Involvement In Cattle Killings

by Sarah Jane Matt

Faculty Advisor: Dr. Rob Wilson

When a cow is found dead with eyes, tongue, and udder missing, it is easy to write it off as the remains of an unusual animal attack. However, upon closer inspection this explanation begins to falter. It is found that the cow's missing organs were removed by a sharp object with surgical precision, there is no trace of blood around the body, and not a footprint to be found. When there have been discoveries of 10,000 similar cases in the US since 1967, the event becomes baffling. These incredibly precise cattle mutilations have been plaguing American farmers for years. In the 1970's alone, approximately 40 cows and bulls were found, skillfully and bloodlessly mutilated. In all cases, authorities were called in, including the FBI. In all cases, the investigation found no explanation for the eerie phenomenon. Some farmers told tales of unusual lights in the sky the night before the cattle were found, while others reported suspicious helicopters hovering

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near the area. While authorities have been unable to determine a culprit, farmers and conspiracy theorists have their suspicions. The mutilations could be the remnants of a midnight occult ritual, performed by secret cultists from the community; the helicopters could signify government involvement in the situation. However, the most prominent of the explanations is the most intriguing to consider: Extraterrestrial visitation.

Dinosaur Conspiracy

by Samantha McKlin

Faculty Advisor: Dr. Rob Wilson

Dinosaurs have always been in the spotlight all throughout the world because of movies, books, pop culture, and museums. Dinosaurs have been extinct for millions of years, and the first dinosaur fossil was discovered in 1819. Paleontologists and archeologists explore the idea to be able to reconstruct an ancient dinosaur with just a few bones and teeth. Therefore, it would seem impossible to construct such an animal like a dinosaur with just a few bones. However, there are researchers that believe that dinosaurs never existed and their bones are man-made. In museums, bones that are on display are sometimes replicas. According to Christianity the existence of dinosaurs seems impossible based on the Bible, and there is no evidence from tribes, cultures, and countries that dinosaurs ever existed until the late 1800s. Another conspiracy of dinosaurs is the history of dragons and how civilizations thought they were finding dragon fossils and believed that dinosaurs are actually dragons. These conspiracy theories about dinosaurs affect the lives of students, paleontologists, and historians. The public either believes that dinosaurs are real because of science or believe they are a myth.

Could Social Media be a Mortality Salience Prime?

by Miriam Mead

Faculty Advisor: Katheryn L. B. Votaw

Research has found that social media can lead to negative emotions and even depression. However, there is a gap in the research when it comes to social media's possible role in Terror Management Theory (TMT). Mortality Salience (MS), which occurs when one is reminded of their mortality, causes individuals to defend their worldviews and attack opposing worldviews, increasing outgroup prejudice and aggression. Outgroup hostility occurs frequently on various social media platforms. Is it possible that social media is acting as the prime to MS? By diving into the literature, it can be seen that there is no very little research to determine if social media is a prime for MS, or if it affects TMT in general. Based on the similarities of patterns in the two literatures, it is hypothesized that individuals on social media may be increasing cultural buffers to combat death anxiety. If social media does play a role in TMT, it could have important implications on how psychologists evaluate interactions on social media. The Templer Scale is explored as a possible MS measure for future research on this subject due to its validity and reliability.

Undergraduate Research Symposium 2020

Stressful Life Events Correlate with Depression Symptoms

by Michelle Mercedes Ming

Faculty Advisor: Dr. Carissa Philippi

Stressful life events, such as abuse, divorce, or spending time in jail have been known to cause psychological and physical symptoms (Billings, 1982). Previous research has examined the association between the amount of stressful life events and the onset of depression (Kendler, 1999). The present study aimed to investigate the relationship between stress and depression in a sample of college students. As a part of a larger study, participants (N = 223) completed online questionnaires that measured their exposure to life stressors on the Life Stress Checklist - Revised (Wolfe and Kimerling, 1997) and depression symptoms on the Beck Depression Inventory (Beck et al., 1996). There was a small/weak positive correlation between the number of life stressors and depressive symptoms, $r(221) = .26, p < .01$. Future directions from this study could include investigating age and sex differences in relation to stress and depression to see if there is a stronger correlation.

Analysis of Deuterated Standards for Determination of Hop Content in Beer

by Matthew Murphy & Bruce Hamper

Faculty Advisor: Dr. Bruce Hamper

Hop plants, *humulus lupulus*, are used in the beer brewing process to contribute aroma, bittering and product stability. Quantifying the bittering compounds, isomerized and oxidized humulones (iso-humulone and humulinones, respectively, and their homologs), are of importance for both quality and promotional purposes. In order to quantify the species present, a stable isotope dilution mass spectrometry (SID-MS) method is being developed using deuterated iso-humulone. In this poster we illustrate the development of our work to date.

The Changing Food Landscape Amid COVID-19 in St. Louis, Missouri

by Heather Parker & Sarah Thebeau

Faculty Advisor: Dr. Susan Brownell

An Observational Comparison of Child Welfare Services: St. Louis, Missouri and San Jose, Costa Rica

by Abigail Rothweiler

Faculty Advisor: Dr. Shawne Manies

Introduction: In Missouri, there are over 13,000 children who are currently receiving care through the state foster care system. For many children, being removed from their families can cause life-long trauma and decreased quality of life. While there are cultural and economic differences between St. Louis, Missouri and San Jose, Costa Rica, the Costa Rican child welfare system, El Patronato Nacional de Infancia (PANI) uses several strategies that may be beneficial in St. Louis.

Purpose: To examine the current policies and programs in San Jose, Costa Rica to determine if they can be adapted for use in St. Louis, Missouri. By completing this literature review along with the observations between the two areas, steps can then be taken to improve the quality of life and long-term outcomes for children in the foster system in St. Louis, Missouri.

Methods: A literature review was completed by searching via UMSL library databases and

University of Missouri-St. Louis

official state websites. Additionally, observations and volunteer work were done in group homes in San Jose, Costa Rica. All of the information was then compiled and analyzed to see if ideas and programs in San Jose would be beneficial in St. Louis.

Results: There are several programs in San Jose that could improve the foster care system in St. Louis. These include programs for adolescent mothers, early intervention systems for the entire family, and adolescent empowerment.

Implications: Steps need to be taken to create these programs or incorporate them into existing services in St. Louis. These programs have the potential to decrease trauma and improve quality of life of the children and adolescents in St. Louis, Missouri.

Historical Trauma Response Scores as a Function of Unresolved Grief and Substance Use Disorder in American Indian Populations

by Andrew R. Saunders

Faculty Advisor: Dr. Kimberly Werner

Researchers are interested in the outcomes of interventions, specifically, measuring historical trauma (HT) among American Indian/Alaska Native communities and the long-term distress and substance abuse as a result of historical trauma response (HTR). Previous literature has implicated limitations in the clinical conceptualization of the relationship between intergenerational transfer of HTR and substance abuse. The aim of the current study is to examine treatment efficacy of 50 homosexual, American Indian males randomized to a culturally-adapted juxtaposition of (1) Group Interpersonal Psychotherapy (IPT), (2) Cognitive Processing Therapy (CPT), and (3) Historical Trauma and Unresolved Grief Intervention (HTUG), or (4) waitlisted on American Indian populations, with and without comorbid Substance Use Disorder (SUD). In a multiple-arm randomized controlled trial Fifty homosexual, male AI participants will be recruited from a Midwestern, American Indian reservation and compensated a small monetary reward. A multitude of surveys and scales will be administered to participants for assessment including, The Historical Loss Scale(HLS)and its counterpart Historical Loss Associated Symptoms Scale(HLASS), which qualitatively measure historical trauma. Results are expected to reveal a reduction in mean HT scores from the group receiving a conjunction of a 2-arm culturally-congruent intervention which will be statistically significantly more efficacious for Substance Use Disorder (SUD), compared to the group in the waitlisted condition; such that, the expected findings suggest the treatment arm group are more likely to experience large reductions in incidence of substance abuse, in contrast to the group in the waitlist control.

Examining Access to Sexual and Reproductive Health Care Services and Information for Young Women with Physical Motor Disabilities in Dakar, Senegal

by Olivia Soule & Diatou Sonko

Faculty Advisor: Dr. Larry Irons

Access to and use of sexual and reproductive health (SRH) services in Senegal remains low despite local and international interventions and campaigns to increase contraception use, increase knowledge regarding Sexually Transmitted Infections (STI), and increase access to reproductive health services. Among marginalized groups, such as people living with disabilities, access to and use of services and information are even lower, and there are gaps in research

Undergraduate Research Symposium 2020

involving Senegalese people with disabilities and their access to and use of SRH services and information. This mixed-methods, community-based participatory research examines how Senegalese women navigate their sexual and reproductive health care. It seeks to illuminate the factors that stimulate or block access to SRH services for women with motor disabilities; to discover the extent to which these women know about common STIs, contraception, and from where they receive/d this information; and to highlight the experiences they have had while accessing these health services and information. After using a snowball sampling method to identify participants, 31 women in the Dakar region were interviewed using a semi-structured questionnaire. Results show that these women have faced significant discrimination from health care professionals because of their disabilities, have difficulties accessing health care services because of inaccessibility, have low knowledge of STIs and contraception, and wish to see improvements in the Senegalese health care system specifically geared toward people with disabilities. Evidence from this research may lead to policy and programmatic changes regarding SRH services so that women with physical disabilities receive and are able to access health care and information that is best tailored to their needs.

Overdose Risk Amongst Medicaid Users Diagnosed with Opioid Use Disorder Within Disabled and Impoverished Populations

by Christopher Vance, Colleen Mulligan, David Von Nordheim, & Jodi Heaps-Woodruff
Faculty Advisor: Dr. Jodi Heaps-Woodruff

Background:

Opioid use in the United States has been disproportionately rising in the last decade and differences in opioid abuse is reported to be significantly different based on a number of different factors, including race, gender, city density, and age. Discriminatory distribution of medication for individuals seeking opioid use disorder (OUD) treatment along the lines of these different disparities is an issue of grave importance in both medical and ethical fields.

Methods:

Patients were obtained from the Medicaid enrollment file, emergency department, hospital, and pharmacy claims. Individuals with in or outpatient claims from 2016-2018 for OUD were identified and the use of medically assisted treatment (MAT), no medical assisted treatment (NMAT) was assessed over the course of a year. MATs most commonly used to treat OUD, buprenorphine or naltrexone, were analyzed for risk of overdose following treatment seeking for OUD. Eligibility by income, disability and age were deduced by ICD codes. Cox proportional hazard regression was used to analyze OUD risk of overdose.

Results:

Multiple different disparities were found in the study between demographics. Significant results were found between sexes, city density, medicaid eligibility (income or disability), and age. There was also a significant difference in the overdose rate between eligibility and MAT treatment. Individuals eligible because of disability had significantly lower rates of survival when taking buprenorphine than those who were eligible because of income.

Conclusions:

Patients given MAT to combat OUD had significantly different outcomes under multiple different demographics. Further investigation is needed for the reasoning of prescription of

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naltrexone over buprenorphine, the reasoning for reduction in overdose rates as an individual gets older, and the reasoning of difference in outcomes based on eligibility.

TWA Flight 800: The Conception and Rejection of The Official Story

by Maxwell R. Wooten

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A group of people, known to some as conspiracy theorists, dispute the official story surrounding the crash of TWA Flight 800. On July 17th, 1996, TWA 800, a Boeing 747, exploded mid-air and fell into the Atlantic Ocean. The National Transportation Safety Board investigated the crash for four years and concluded an explosion of unknown cause erupted from the center fuel tank of the plane (Aircraft Accident Report NTSB/AAR-00/03). Conspiracy theorists claim the United States is lying. Of the 700 witnesses interviewed by the investigation, over 100 of them saw an object rise from the horizon into the plane, followed by an explosive fireball. Additionally, investigators found multiple types of explosive residue on the plane's wreckage (TWA 800: the Crash, the Cover-up, and the Conspiracy). Radar data found debris leaving the plane at speeds only a missile could produce, contradicting the official story. The conspiracy theorists believe someone shot TWA 800 down with a missile and the U.S. Government is covering the story up for their own gain. Unlike other alternate theories, the conspiracy theorists have many experts on their side. The site www.twa800.com contains evidence compiled by the Associated Retired Aviation Professionals, an independent group set up to challenge the official story. The documentary TWA Flight 800, produced by a physicist, presents vast testimony from some of the actual NTSB investigators who believe the government did not let them uncover the real truth. These people are not the stereotypical fringe crazies, but rather concerned citizens that fear their own government is hiding the murder of 230 people. To conspiracy theorists, the investigators use any means necessary to discount the missile theory and force the public to accept their version of events. In today's world, the U.S. government has one of the largest concentrations of power in the world. If they are hiding the real truth behind TWA 800 then what else could they be hiding?

