

THE SLU MCNAIR RESEARCH JOURNAL

Summer 2018, Vol 1



Saint Louis University



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Made possible through a grant from the U.S. Department of Education to Saint Louis University, the Ronald E. McNair Post-Baccalaureate Achievement Program (McNair Scholars Program) is a TRIO program that prepares eligible high-achieving undergraduate students for the rigor of doctoral studies. These services are also extended to undergraduates from Harris-Stowe State University, Washington University in St. Louis, Webster University, University of Missouri St. Louis and Fontbonne University.

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MESSAGE FROM THE DIRECTOR

Greetings,

On behalf of the McNair Scholars Program at Saint Louis University, I am honored to present the first volume of our *SLU McNair Research Journal*, a culmination of our 2018 Summer Research Internship Program. During the eight weeks of the internship, 12 of our scholars conducted faculty-supervised research projects, which they had an opportunity to present at our inaugural McNair Research Symposium at SLU. Subsequently, several of them have gone on to present their summer research at other forums, including:



- The Association for Humanist Sociology Annual Meeting in Detroit, MI
- The McNair Heartland Research Conference in Kansas City, MO
- The Minority Access' National Role Models Conference in Washington, DC
- The Tyson Research Center Symposium in Eureka, MO
- The University of Mexico McNair Research Conference in Albuquerque, NM

We are extremely thankful to the faculty mentors who have dedicated their time, leadership and support to our McNair Scholars, as well as to the members of our 2017-2018 McNair Advisory Board, who gave talks, facilitated workshops and provided general support to our program. We could not have achieved the level of success experienced during the first year of the McNair Scholars Program at SLU without the collaborative efforts of everyone involved.

Special thanks to the two outstanding graduate assistants who worked together on this volume – McNair GA, Sunita Manu and TRIO-Student Support Services Writing Fellow, Darrin DeChane. Their impressive talents, skillsets and teamwork have played a paramount role in the success of this project. Thanks also to McNair Academic Coordinator, Anthony Gills, who offered guidance and support to the Scholars throughout the summer internship and continues to be an integral part of their educational and professional development. Last but by no means least, thank you to Will Perkins, Director of Pre-College, Access and TRIO Programs, whose vision and leadership paved the way for Saint Louis University to receive the McNair grant in 2018. His confidence in the abilities of the McNair staff and scholars and ongoing support of the program have been invaluable.

Sincerely,

Jamie D. Motley, Ph.D.
McNair Scholars Program Director

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- ❖ Ricardo Saucedo
- ❖ Wendy Teal
- ❖ Jazmine Terrazas
- ❖ Brendan Underwood
- ❖ Carissa Villanueva
- ❖ Ngohile Yakubu

MCNAIR STAFF



Jamie D. Motley, Ph.D.

Program Director

Dr. Jamie D. Motley first began working in TRIO as a graduate student at the University of Illinois at Urbana-Champaign, where she earned her Master's Degree in Higher Education Administration and Ph.D. in Educational Policy Studies. She has held leadership positions at multiple colleges and universities in Illinois, Georgia, Alabama and Missouri. Dr. Motley began her tenure at Saint Louis University in 2014 as a member of the TRIO Student Support Services staff and was promoted to McNair Scholars Program Director in the fall of 2017. In addition to her graduate degrees, she holds a Bachelor of Arts Degree in Journalism from Western Illinois University.



Anthony Gills, MSW

Academic Coordinator

Anthony Gills joined the McNair Scholars Program staff in November of 2017. Prior to that, he was a Relationship Manager, Post-Secondary Prep at Big Brothers Big Sisters of Eastern Missouri. He was also a practicum student with TRIO Student Support Services, as well as the TRIO Educational Talent Search Program at Saint Louis University. Anthony has a Bachelor of Arts in Criminology & Criminal Justice from Southern Illinois University-Carbondale and a Master of Social Work from Saint Louis University. He is currently pursuing a Ph.D. in Higher Education Administration. As the academic coordinator for McNair, Anthony provides academic and personal support to McNair Scholars, assisting with program-related projects and activities, coordinating workshops and monitoring each Scholar's participation and success in the program.



Sunita Manu

Graduate Assistant

Sunita Manu became part of the McNair Scholars Program in September of 2018. She is a second-year graduate student at St. Louis University College for Public Health and Social Justice. Her MPH focus is in global health and epidemiology. Prior to McNair, Sunita was an assistant with L'Arche St. Louis where she worked with individual with intellectual disability. Sunita also worked as a student research assistant. As the graduate assistant for the McNair Scholars program, Sunita provides academic and personal support, assist scholars with completing their college application, and help with event planning.

MCNAIR SUMMER INTERNS 2018



Zarek Burton

is a senior majoring in Biology at Saint Louis University. He is from St. Louis, MO. He conducted his summer research under the guidance and supervision of Dr. Lynda Morrison, Professor of Molecular Microbiology & Immunology at SLU.



DelShawn D. Fowler

was born and raised in Detroit, Michigan. He is a junior at Harris-Stowe State University and is majoring in Biology. His McNair Faculty Mentor is Dr. Jon Fisher, Professor of Biology at SLU.



Maria Garcia

is a senior at Saint Louis University. She hails from San Francisco, CA and is double majoring in Health Management and Sociology with a minor in Urban Poverty Studies. Her current research interest involves exploring how bicultural individuals' ethnic identity is characterized and experienced by first and second-generation immigrant Americans adolescents. Maria's McNair Faculty Mentor is Dr. Ajlina Karamehic-Muratovic, Assistant Professor of Sociology & Anthropology at SLU.



Brandon T.M Hughes

is a junior at Saint Louis University, majoring in Industrial-Organizational Psychology and minoring in African American Studies. He also has an interest in International Business. His McNair Faculty Mentor is Dr. Richard D. Harvey, Associate Professor of Psychology at SLU.



Derek McFarland

is a junior from East St. Louis. He attends Harris-Stowe State University, where he is majoring in Biology. His McNair Faculty Mentor is Dr. Leticia De Souza Soares, Assistant Professor of Biology at SLU. Derek was the recipient of a fellowship from Washington University's Tyson Research Center where he has been co-mentored by Dr. Solny Adalsteinsson.



Taylor Robinson

is a senior at Saint Louis University. She is pursuing a double major in Public Health and African American Studies, and her McNair Faculty Mentor is Dr. Keon Gilbert, Associate Professor of Behavioral Science & Health Education at SLU. Taylor's research interests include critical race theory, health disparities, health and social inequities, and the intersection of race and health outcomes.



Yesenia Sanchez

is a senior at Saint Louis University, majoring in French and International Studies with minors in Political Science and Women and Gender Studies. Her research interests include forced migration, ethnic origins, and identities. She has previously presented her work at the Heartland Research Conference in Kansas City, Missouri and at a workshop titled "Conversation sur l'Immigration" at Saint Louis University. Her McNair Faculty Mentor is Dr. Annie Smart, Professor of Languages, Literatures, & Cultures at SLU.



Ricardo Saucedo

is a senior majoring in Computer Science at Saint Louis University and hails from Aurora, Illinois. Under the supervision of Dr. Kevin Scannell, Professor of Computer Science. Ricardo has been conducting research on biases that exist in algorithms and models used against minority-races and queer users online.



Wendy Teal

is a senior at Saint Louis University, majoring in Neuroscience. She was born and raised in Saint Louis, Missouri. Her McNair Faculty Mentor is Dr. Alaina Baker-Nigh, Assistant Professor of Biology.



Devonn Thomas

is a junior at Saint Louis University, where she majors in African-American Studies. She completed her summer research under the supervision of Brendan Roediger, J.D., Associate Professor at Saint Louis University's School of Law.



Carissa Villanueva

is from Des Moines, Iowa and is a junior at Saint Louis University. She is double majoring in Mathematics and Anthropology and plans to pursue graduate study in Biostatistics upon completing her undergraduate degree programs. Her McNair Faculty Mentor is Dr. Mary R. Vermilion, Associate Professor in SLU's Department of Sociology, Anthropology, and Forensic Science.



Ngohile Yakubu

was born in Nigeria, West Africa but is a native of St. Louis. She is a senior in the Doisy College of Health Sciences at Saint Louis University and is majoring in Health Information Management. Her McNair Faculty Mentor is Dr. Dannielle Davis, Associate Professor of Leadership and Higher Education at SLU.

RESEARCH ARTICLES

USING MATRIX ASSAYS TO ANALYZE THE SYNERGISTIC EFFICACY OF ANTIVIRAL AGENTS AGAINST HSV-2

Zarek Burton

Faculty Mentor: Lynda Morrison, Ph.D.

Saint Louis University

Abstract

Over 400 million people world-wide have genital HSV-2 infections. The current therapies against HSV-2 infections include Acyclovir (ACV), which is incompletely effective, and Foscarnet for ACV-resistant herpes virus strains, which causes nephrotoxicity. We hypothesize that the nucleotidyl transferase superfamily (NTS) inhibitors, ciclespivox olamine (#41), an FDA-approved drug for topical use, and piroctone olamine (#191) will synergize with acyclovir (ACV) in vitro to act as a safe and effective agent against HSV-2 infections. Previous studies have indicated that compound #41 and #191 were found to inhibit viral replication at an early stage against one or more targets. This data provided sufficient evidence to suggest that these compounds could be effective in suppressing HSV infection in combination with ACV. To test this hypothesis, I performed synergy assays that contained both drugs in Vero cells, and quantitatively analyzed titers using the CompuSyn application. This computational method produced a combination index (CI) value greater than 1 for each synergy assay, indicating antagonism. Additionally, FOS was shown to be ineffective against ACV-resistant strains of HSV. This experiment was performed once for each drug, and more rounds of synergy assays are necessary to make an accurate conclusion. The purpose of this research was to identify a new combination of drugs with antiviral properties that work synergistically to yield the lowest concentration of herpes virus. If one of these, or other NTS inhibitors is found to work synergistically with acyclovir, then it will be a critical step in developing effective antiviral drug therapy for herpes infection.

Introduction

Combination therapies are frequently utilized in the treatment of viral infections. In this experiment, I combined the existing antiviral agent against HSV-2 infections, Acyclovir (ACV), with nucleoside analog compounds; ciclespivox olamine, #41, and piroctone, #191, in separate assays and analyzed the viral titer to test their combined effects. Additionally, I determined the EC50 of the compound, Foscarnet (FOS). These viral titers were quantified using the combination index theorem developed by Chou and Talalay. We found that combinations of the nucleoside analog

compounds with ACV against HSV-2 were antagonistic, and not synergistic. Additionally, Foscarnet, is the current therapy for ACV-resistant HSV strains, however, our experiment showed that Foscarnet is not an effective agent against HSV infections. This analysis can be compared to similar biomedical research studies that analyzed the effectiveness of drug combinations used to treat HIV. At the Howard Hughes Medical Institute in the Department of Genetics at Harvard Medical School, the Xu lab examined nearly 500,000 drug pairs—identifying drugs that synergize

to inhibit HIV replication.¹ They identified combinations of anti-inflammatory drugs that worked in pairs to synergize by targeting different steps of the HIV life cycle.

Existing drugs that treat HSV infections include Acyclovir (ACV) and Foscarnet (FOS). Acyclovir is an approved treatment for HSV infections—available as a topical dosage or an oral dosage. FOS is used for ACV resistant mutant strains, which act by inhibiting chain elongation of viral DNA polymerase; however, it is highly toxic. Ciclopirox (#41) has been used as a topical anti-mycotic drug for onychomycosis (toe fungus infections), and studies show that it is safe to apply vaginally to treat yeast infections.^{1A} Piroctone (#191) is not approved for pharmaceutical use in the U.S.; however, it has also been shown to act as a safe anti-fungal agent. This research project is focused on analyzing the synergistic properties of drugs #41 and #191 because previous studies by the Morrison laboratory discovered that these drugs inhibit at least one event in herpes simplex virus replication that occurs at a very early, post entry stage of herpes virus replication, plus one or more events that occur during a later phase of viral replication.² Additionally, #41 can suppress ACV-resistant mutant viruses suggesting the possibility of synergy with ACV.

Methods

A plaque assay to test for synergy was performed to assess the additive or synergistic activities of ciclopirox and piroctone with existing antivirals ACV or FOS in vitro. First, a plaque assay was

necessary to determine the 50% effective concentration value (EC₅₀). Then, in a standard assay, I serially diluted the two compounds with PBS and added them to cells, either alone or in a combination ratio, including the virus. Next, I incubated the cells for 24 hours and collected all wells. Finally, I quantified the viral titer by plaque assays. I used the Chou-Talalay method for the matrix assays to compare the drugs' combined effects. The Chou-Talalay method is a quantitative technique used to assess the additive and synergistic properties of the drug combinations. This method is derived from the median-effect equation which includes major biochemistry and biophysics equations.³ The calculated results from the titers will be plotted on a graph with the concentration of drug 1 on the x-axis and the concentration of drug 2 on the y-axis. A software program, CompuSyn (combosy.com/), will be used to interpret the data. The Compusyn software produced a concentration index (CI) value that will be used to determine synergy, additivity, or antagonism.

Results

The results of this experiment can be observed in *Table A*. The combination index (CI) value for ACV and Compound #41 was 1.73, and the CI value for ACV and Compound #191 was 1.77. Since these values are greater than 1, they indicate antagonism. The EC₅₀ value was calculated for Foscarnet. This value is the inflection point on each graph. The EC₅₀ can be observed in *Figure 1.0* and *Figure 2.0*.

¹ Tan, X. Hu, L et al. (2012). Systematic Identification of Synergistic Drug Pairs Targeting HIV. *Nature Biotechnology*, 30(11), 1125-1130.

^{1B} Subissi, A et al. (2010). Ciclopirox: recent nonclinical and clinical data relevant to its use as a topical antimycotic agent. *Drugs*. 70:2133-2152.

² Tavis, JE et al. (2014). Inhibitors of nucleotidyl transferase superfamily enzymes suppress herpes simplex replication. *Antimicrobial Agents and Chemotherapy*, 58:7451-7461.

³ Chou, Ting-Chao. (2010). Drug Combination Studies and Their Synergy Quantification Using the Chou Talalay Method. *The Journal of Cancer Research*, 440-446.

Table A - AC Synergy Assay

	CI Value	Synergy, Additivity, or Antagonism?
ACV + #41	1.73	Antagonism
ACV + #191	1.77	Antagonism

EC50 Compound #41 vs. HSV2

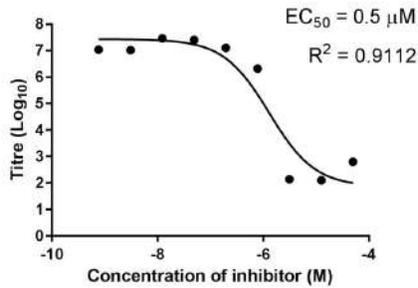


Figure 1.0

Exp #: EC₅₀ Compound FOS vs. HSV-2

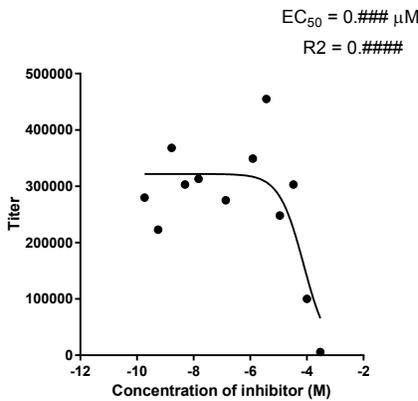


Figure 2.0

Discussion

This experiment was only performed once for each synergy assay. More rounds are necessary to conclude if synergy has occurred. Due to the ability for HSV to mutate to escape existing antiviral therapy, there is a significant need for anti-herpes virus drugs. This research can help develop new topical drug candidates to treat herpes infections in combination with existing drugs. HSV-2 infections are acquired through sexual contact. The prevalence of genital HSV-2 infections in the United States is about 22%, a 30% increase over the past decade. HSV-2 persistently infects 1 in 6 Americans and more than 400 million people worldwide. Incidences of infection are highest among black women, particularly of a lower socioeconomic status. Also, viral strains resistant to antiviral therapy are more common in immunocompromised individuals. This study is significant because it addresses the need for more effective antiviral drug treatment for HSV infections. Anti-herpes virus medications are needed now more than ever to effectively suppress primary and recurrent HSV-2 infections due to an increase in ACV-resistant virulent strains.

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Chou, Ting-Chao. (2010). *Drug Combination Studies and Their Synergy Quantification Using the Chou Talalay Method*. The Journal of Cancer Research, 440-446.

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Tavis, JE et al. (2014). *Inhibitors of nucleotidyl transferase superfamily enzymes suppress herpes simplex replication*. Antimicrobial Agents and Chemotherapy, 58:7451-7461.

Whitley, Richard J. (2001). *Herpes Simplex Viruses*. Lippincott Williams & Wilkins, Virology 5th Edition.

STRATEGIES FOR TREATMENT OR PREVENTION OF DIABETES USING A CHEMICAL THAT MIMICS EXERCISE

DelShawn Fowler

Faculty Mentor: Jonathan Fisher, Ph.D.

Saint Louis University; Harris-Stowe State University

Abstract

The purpose of this experimental research is to identify a few objectives or aims that could potentially develop strategies for treatment or prevention of diabetes, with exercise being one of the concentrations for treatment. The aims will be treating muscle tissues with chemicals that mimic the effects of a chemical that mimics the metabolic stress of exercise (AICAR) and examining effects on proteins involved in control of metabolism, including AS160, NADPH oxidase (NOX), serum/glucocorticoid-regulated kinase 1 (SGK1), AKT, protein kinase C (PKC), and glycogen synthase. Studying these proteins will help to understand if they have a connection to diabetes. Conducting this experiment will assist in distinguishing whether the activation of each proteins is caused by the exercise-mimicking chemical. This experimental study will be conducted to test the hypothesis that a drug mimicking exercise could be used to potentially lessen the effects diabetes by activating or deactivating proteins that are responsible for controlling metabolism including the response to insulin. We found that AICAR increased glycogen synthase activity and also increased AS160 phosphorylation.

Introduction

Diabetes is a disease that occurs when your blood glucose is too high. It can also be referred to as high blood sugar, which is a main source of energy created when you consume food. Insulin is important when dealing with diabetes because it serves as a hormone made by the pancreas. A function of insulin is helping to get glucose from food into your cells for ATP or energy. In many cases your body may not make enough insulin or your cells will not respond properly to insulin. With this in mind glucose will then stay in your blood and does not reach your cells. This means that there is an irregular regulation of blood glucose, such as diabetes (Anon, 2018).

Diabetes can increase the risk of cardiovascular diseases (heart disease), which is the leading cause of death in the U.S. This is becoming a great problem in the United States because if the number of

people with heart disease increases then the cost of health care will also increase, making it much harder for many low income households to afford it. Between 2010 and 2030, the total direct medical costs of heart disease is projected to triple, from \$273 billion to \$818 billion (Khavjou, 2011). As of 2014, more than 29 million people in the United States had diabetes, according to a report released by the Centers for Disease Control and Prevention. Without weight loss and moderate physical activity, 15 percent to 30 percent of people with prediabetes will develop type 2 diabetes within five years of their life.

The normal regulation of glucose is very important because it is necessary for cellular respiration which is needed for all body cells to develop and give energy. The body obtains glucose from the breakdown of foods and drinks consumed containing carbohydrates. Glucose is taken up by cells

immediately after meals, and for later use it can also be stored in the liver and muscles as glycogen. Hormones such as insulin and glucagon regulate both the storage and the utilization of glucose as it is required by the body's cells. Pancreatic cells can sense blood glucose levels, and afterwards the pancreatic cells secrete glucagon or insulin to maintain normal blood glucose levels. The level for blood glucose sugar concentration is maintained between 70 mg/dL and 110 mg/dL. If blood glucose concentration rises above this range, insulin will be released. This will help to stimulate the body's cells to remove glucose from the blood. If the opposite happens, glucagon is released stimulating the body's cells to release glucose into the blood (17.9 The Endocrine Pancreas, 1999-2018).

Many patients with diabetes suffer from obesity, making it very difficult to exercise. Exercise is important because it aids in the prevention of insulin resistance, which is the main cause of diabetes. Previous research on rats with normal insulin sensitivity revealed that regular exercise increased insulin-stimulated glucose uptake. This means that exercise helps to decrease blood glucose concentrations and also the insulin requirement for people with diabetes. Procedures were conducted and determined that exercise would affect the rate of glycogen accumulation in skeletal muscle. Exercise stimulates glucose clearance from the bloodstream (17.9 The Endocrine Pancreas, 1999-2018).

In other words, insulin is a hormone that causes blood sugar (glucose) to be stored in muscle, and diabetes basically is the abnormal regulation of blood glucose concentrations caused by resistance to insulin. Studies show that the muscle is the largest storage site for blood sugar, which is why muscle is the most important tissue for

glucose storage. Exercise is very important for patients with diabetes because it makes insulin work better, causing sugar uptake into muscles to improve (known as insulin sensitivity). It is not entirely known how exercise causes insulin sensitivity, thus causing my mentor and I to develop an experiment to understand this process a bit more (Fisher, 2008).

Proteins are long chemical building blocks of amino acids that are used for cell growth and development. In this case, the proteins of interest are specifically responsible for controlling metabolism (chemical reactions that take place inside the body) including the response to insulin. The proteins of interest are regulated by phosphorylation which works to modify proteins making them more active or less. To phosphorylate a protein means that amino acids in proteins are being altered by adding a phosphate group to the protein, causing a change in the protein's structure or function (Franz, 2018).

We will treat cells with AICAR to see if this will lead to modification of proteins of interest. The presence of AICAR is used to mimic metabolic stress. AICAR will help to mimic the effects of exercise, causing an increase in insulin-stimulated glucose uptake or increased insulin sensitivity. By examining effects of AICAR on protein phosphorylation, our aim is to uncover processes that could help to prevent or lower high blood glucose. In the long run this prevention will benefit in creating a cure or lessen the effects of diabetes in obese people.

Our hypothesis is that AICAR will lead to modification of proteins of interest shown in figure 1, which would suggest a role of these proteins in causing sensitivity to insulin. The figure shows that AICAR causes

modification of these particular proteins. When this is done each protein could increase or activate insulin sensitivity. Our long-term goal is to determine whether use each protein could work with the help of AICAR to treat type 2 diabetes or lessen the effects that it has on patients. When insulin sensitivity increases, the blood glucose will be regulated properly and will stop the buildup of cells in the bloodstream.

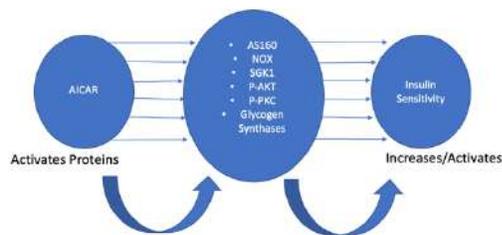


Figure 1. Hypothesized role of the exercise mimetic AICAR in causing insulin sensitivity. (This picture basically summarizes the research that is the focus of this study. It shows how AICAR will turn each protein off or activate it causing an increase in insulin sensitivity for muscle cells.)

Methodology

To start this research experiment, we used western blots to examine specific proteins after treatment of muscle cells with AICAR. Western blots are used for protein analysis because it produces qualitative data about the protein of interest. This action is known as protein phosphorylation which is a process that can modify proteins making them more active or less. To phosphorylate a protein means that amino acids in the protein are being altered or modified. The term “blotting” refers to the transfer of biological samples from a gel to a membrane which later helps to detect complex protein mixtures. In the most basic

terms, western blots are used to detect the presence of a specific protein in a complex mixture extracted from cells or tissue (Scofield, 2009).

Furthermore, we also used a microplate reader for the glycogen synthase assay. This reader works to detect biological, chemical or physical reactions of samples. With this reader, a 96 well plate is used with 100-200 microliters of a solution, allowing the reader to measure each reaction with either absorbance, luminescence, or fluorescence. Microplate readers are usually used for protein and cell growth assays. With this in mind, we measured the density of glycogen synthase which shows that the reaction was altered or modified (Crutchfield, 2001).

Lastly, we cultured mice tissue to cure the cells with different treatments. Cell culturing is a technique in which cells are removed from an organism and placed in a fluid medium. The cells are grown in a plate with growth medium as cell food, and are kept inside an incubator so that they are not contaminated. With cell culturing, it is possible to control the growth rate of cells; cells can also be manipulated by introducing nucleic acids to a cell. The samples from the mice tissue are also used as samples in western blotting from the cell culturing process (Philippeos, 2012). Collection of muscle tissue from mice was approved by the Saint Louis University Institutional Animal Care and Use Committee.

Results

With the information presented, Figure 2 shows the density of the control group and the protein combined with AICAR. In figure two below, the results show that AICAR has no effect on this protein because on average the control (C) and AICAR-treated (A) samples are similar. With this protein in mind, we now know that SGK1 does not

help to decrease insulin resistance because the control group and test group have the same density level on the membrane (density is the mass of the protein that is detected).

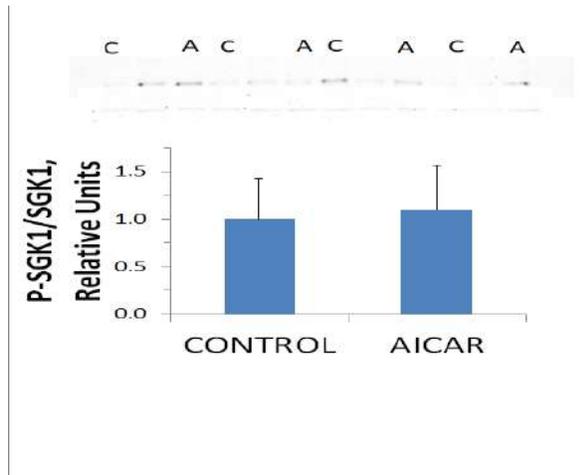


Figure 2: Phospho-SGK1 Data

Figure 3 also shows AICAR does not affect NOX activity. Thus, we can assume that this protein will have no benefit in assisting to decrease insulin resistance in muscle cells. Image 1, shows accumulation of a product of the enzymatic activity of NOX proteins.

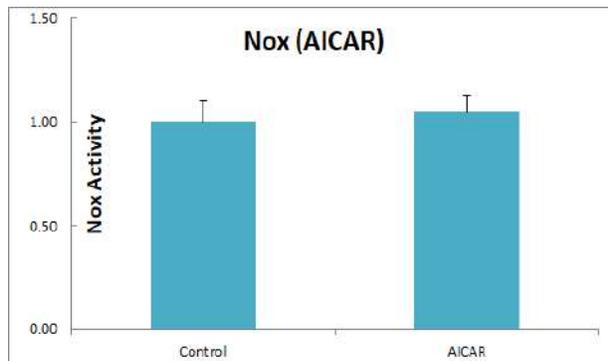


Figure 3: NOX Activity

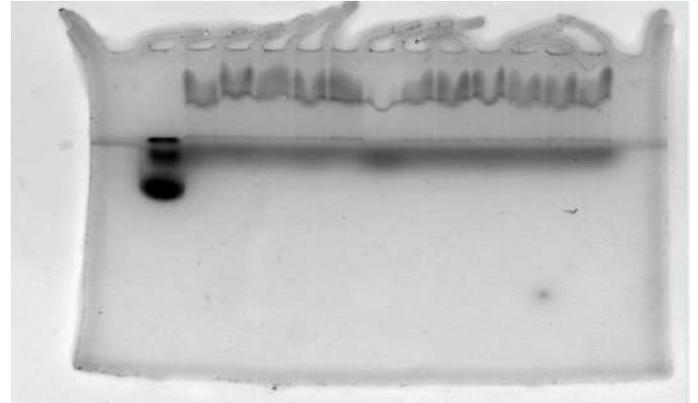


Image 1: Enzymatic activity of NOX proteins

Figure 4 shows that the AICAR has an effect on glycogen synthase, meaning that it could help to increase the sensitivity to insulin. This will be noted to use in further research.

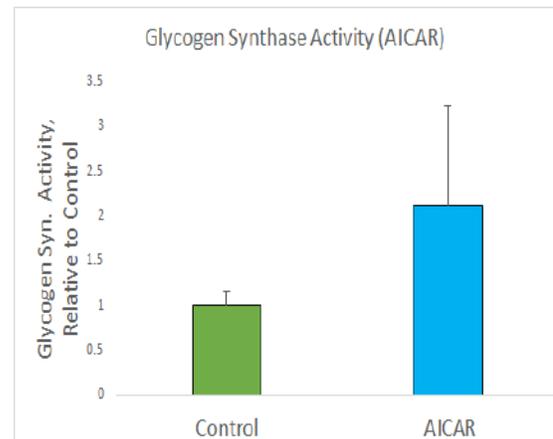


Figure 4: Glycogen Synthase Activity Data

Image 2 shows a membrane that has transferred proteins on it that were phosphorylated after treatment of cells with AICAR. Figure 5 shows that this protein certainly had a reaction to AICAR meaning that it could help to activate insulin sensitivity.

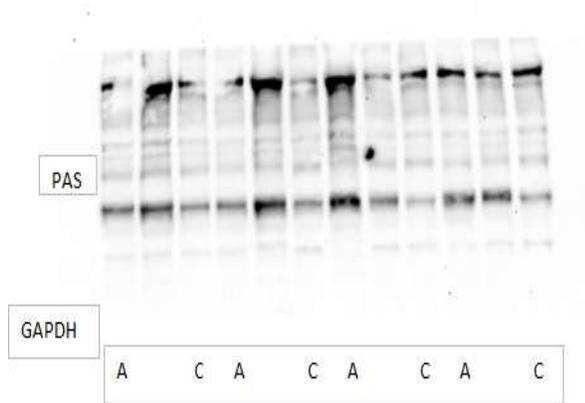


Image 2: Phospho-AS160

Figure 6 shows that AICAR has no effect on phosphorylation of Akt. The control group has darker bands than the bands for the AICAR-treated group. The amount of GAPDH protein was measured as a loading control.

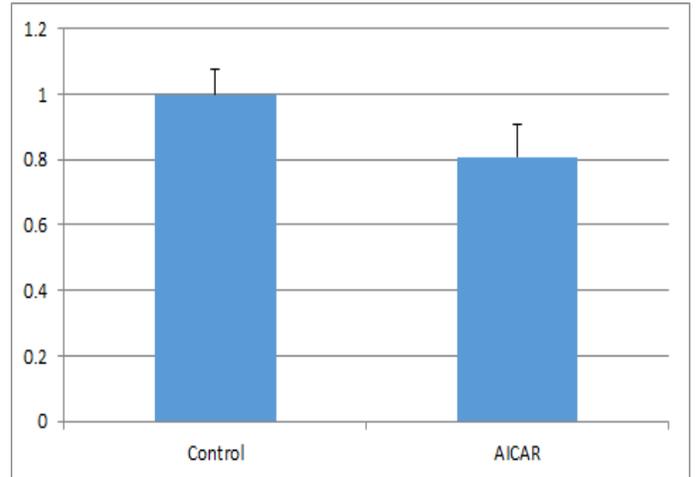


Figure 6: Phospho-AKT

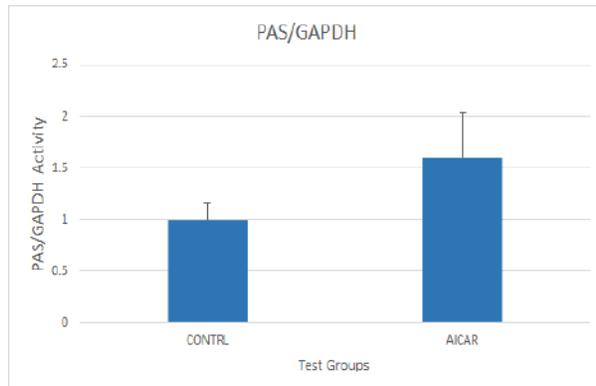


Figure 5: Phospho-AS160

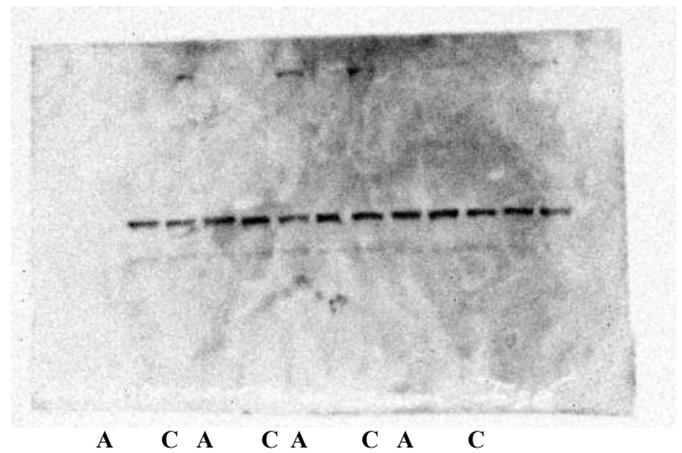


Image 3

Figure 7 shows the presence of AICAR has no change on the amount of Phospho-PKC protein. On average, the control group and test group has the same density as shown in the membrane. We can infer that this protein is not involved in causation of insulin sensitivity to increase.

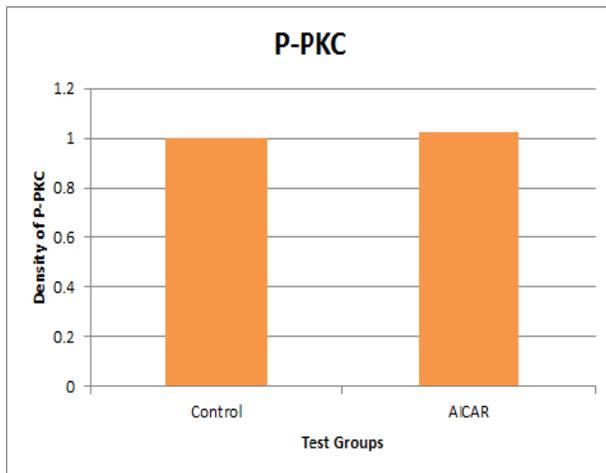


Figure 7

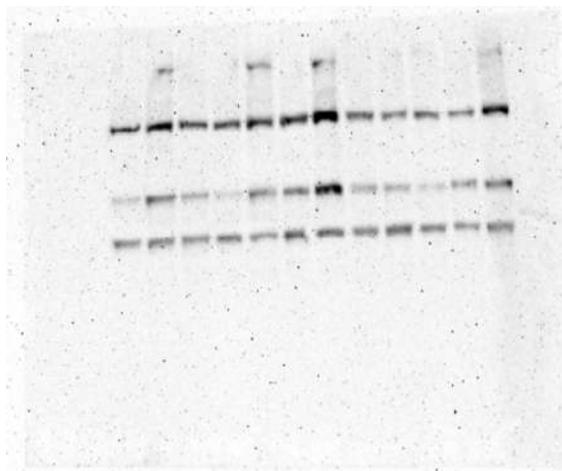


Image 4 A C A C A C

Conclusion

As stated above, our hypothesis is that treating cells with AICAR would affect candidates for control of insulin sensitivity. Our data shows that 2 out of 6 proteins are responsive to AICAR which is great because four unresponsive proteins were eliminated as candidates for control of insulin sensitivity in response to AICAR. To conclude, we found that AS160 and glycogen synthase are the two targets to focus on for further research. They show a higher reaction than any of the other proteins after the AICAR treatment. Furthermore, with more search down the line, we could focus more on these two proteins to figure out if they are in connection with decreasing insulin resistance. This discovery will help to solve the mystery of how exercise causes insulin to facilitate (make easier or possible) glucose uptake.

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CROSS-CULTURAL IDENTITY OF SECOND-GENERATION IMMIGRANT YOUTH

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Abstract

Immigrating to a new homeland is not without its challenges. One of the challenges important in the process of assimilating and acculturating is a “fundamental tension between ‘American’ and ‘Non-American’ identities” that individuals experience on a daily basis. Adapting to a new culture changes how individuals act and feel, and influences one’s cultural identity. This study focuses on second-generation Bosnian youth living in St. Louis, Missouri, whose parents arrived in the United States some 20-25 years ago as refugees. The study explores the influence of ethnic identity on these youth’s feelings of belongingness, especially in regard to partial or total affiliation with either their ethnic or host community. Moreover, this paper seeks to explore how bicultural individuals’ ethnic identity is characterized and experienced by second-generation immigrant Bosnian-American youth.

Keywords: Ethnic identities, assimilation, first & second-generation youth

Introduction

This research paper explores how bicultural individuals’ ethnic identity is characterized and experienced by second generation immigrant Bosnian-American youth.

Second-generation refers to “native-born children of foreign parents or foreign-born children who were brought to the United States before adolescence” (Rumbaut, 2007, p. 985). When a child is born into a host culture that is ethnically and culturally different from the culture of their parents, a complex ethnic identity formation occurs. This is especially true of those who arrive in the host country as a refugee, defined as “a person who flees to another country out of a fear of persecution because of religion, political affiliation, race, nationality, or membership in a particular group” (UNHCR, 1951, para. 1). For these individuals, assimilation and adjustment tend to be particularly difficult, and in some cases, may never occur. Moreover, their first-generation children tend to share many of the parents’ experiences and typically grow up as bicultural individuals stuck

between the cultural world of their parents and the new homeland.

Given the diversity that exists in the U.S., most individuals in the United States identify with one or more ethnic backgrounds. The 2014 U.S. Census Bureau’s projects “that by 2044, the majority of the population will be non-white, with that number rising to 56.4 percent by 2060” (para. 1). With an increase in the number of people who are biracial and/or those identifying with more than one ethnic or racial background, it is crucial to understand the experiences of this group.

As a country that endorses that all cultures should be melted into the one mainstream culture, this “melting pot” idea is frequently complicated by the overlapping identities. More individuals are growing up as biracial or will identify with the new majority of multiple cultures. A person who identifies as biracial can be defined by an individual’s competencies and sensitivities within two cultures and how the identity reflects the

unique blending of the cultures (Ramirez, 1983). Therefore, for bicultural individuals, and youth in particular, identity formation is an ongoing process.

The term *identity* is used to describe a person's character and identification with other individuals. There is not a straightforward way to address the relationship between social and ethnic identities. A social identity is thought of as culturally defined personality characteristics, which are ascribed to social roles, such as the role of being a father, mother, friend, employer or employee (Bhugra and Becker, 2005). Ethnic identity, on the other hand, describes individuals who may or may not share the same race but do share common cultural characteristics, including history, beliefs, values, food, religion, and language. Ethnicity typically incorporates both race and culture (Shah, 2004), adding to the complexity of understanding identity among a single group, such as Bosnian-American youth.

This study aims to explore the identity formation of second-generation Bosnian-Americans, and youth in particular, who resettled in the St. Louis area with their first-generation parents. With an estimated population of anywhere between 50,000 and 70,000 today, St. Louis is home to the largest Bosnian community in the United States and the world (Mapping BiH Diaspora Report, 2018). In recent history, the Bosnian community has dealt the traumatic effects of genocide that forced individuals to flee their country. From March 1992 to December 1995, Bosnia's two neighboring countries invaded Bosnia seeking control over the territory. Nearly two million people were displaced by the Bosnian genocide (Hume, 2015), many of whom found a new home in the U.S. and St. Louis. Individuals were resettled to "St.

Louis because of the low cost of living compared to other cities in the nation" (Hume, 2015, p.10). In the light of the positive social and economic impact of Bosnian migrants on the region (Strauss, 2012), a number of studies have explored the Bosnian culture, history, and relationship to variables of interest. With the second-generation Bosnian-American youth gearing up to graduate from high school, go to college, enter the labor market and start families, this moment provides a unique opportunity to explore their experiences, goals, and aspirations as well as the influences that will shape their lives and community for years to come. Identity, or ethnic identity, on the other hand, is at the center of how second-generation immigrants characterize and think about their experiences, future goals and aspirations, and the various influences on their lives. Therefore, the goal of this study was to explore how ethnic identity is characterized and experienced by second generation Bosnian-American youth in the St. Louis area.

Literature review

Immigrant identity

Studies that have explored immigrant identities have focused on bicultural individuals, and how different people assimilate to the new and host American culture. When immigrants arrive in the United States there is a "fundamental tension between 'American' and 'Non-American' identities" which individuals have to experience daily (Massey & Sanchez, 2009, p. 15). Immigrant integration is a problematic process that individuals have to face when resettling in a new homeland. The meaning and belonging to an ethnic group membership varies based on social, political, and economic forces and how an individual identifies with those factors. That is, individuals' self-

identification along ethnic lines is changeable and so is their participation in shared cultural activities (Dhingra, 2007). This relationship differs between migrant parents and children. Some children are influenced more by other sources such as school, social media, and language, whereas, some parents may or may not chose to incorporate both cultures into their identities.

Children who are second-generation immigrants grow up “exploring the relationship between acculturation and identity” (Schwartz & Montgomery, 2006, p.3). Most individuals find themselves living with two identities or perceiving that one culture is better than the other. American cultural assimilation is arguably unique because of the idea that the United States is “the land of the free,” and the numerous opportunities available for individuals who live there regardless of their background. When immigrants come to the United States with this mindset, most of the time these individuals are let down by the newcomer acceptance. In recent academic debate, researchers found that some children follow the straight-line assimilation model (Waters 1990; Alba and Nee 1997), arguing that more immigrant children are losing their parent’s culture and are becoming more influenced by the new culture. However, some of these theories have been challenged by the ethnocentric tendencies displayed by other individuals (Alba and Nee, 1997). Emerging research is starting to explore how individuals may construct and affirm their ethnic background.

Another topic that is addressed in the literature is the idea of cultural homelessness, which is a “unique experience and feeling reported by some multicultural individuals” (Phinney, 2001, p. 495). This concept examines how individuals feel torn

between identifying with one group of individuals and are not sure what place to call “home.” Similarly, biculturalism “involves a person’s developing competencies and sensitivities within two cultures” (Dong & Gundlach, 2006, p. 65). This area of research addresses the new phenomenon in which individuals are choosing to identify with one group versus the other. Identity development is quite complicated if an individual is a part of two cultures.

Berry’s model

Berry’s Acculturation Model (1997) suggests that all individuals can be categorized in several ways in terms of the level of acculturation. The model proposed by Berry includes four quadrants, namely assimilation, integration, separation, and marginalization. Berry (1997) proposes that individuals’ paths to assimilation vary on the basis of their level of identification with either the heritage or the US culture (see Figure 1).

Acculturation Model		
	Identification with Heritage culture: HIGH	Identification with Heritage culture: LOW
Identification with US culture: HIGH	Integration (Bicultural)	Assimilation
Identification with US culture: LOW	Separation	Marginalization

Figure 1. John Berry’s Acculturation Model

According to Berry (1997), an individual who identifies strongly with both cultures is referred to as having a “bicultural identity” (“integration”), while others who identify far more strongly with the US culture than they do with their heritage culture would fall in the “assimilation” quadrant. Younger

generations usually identify as “bicultural” because of upholding the two cultures or tend to assimilate in whereby an individual “wants nothing to do with their old culture and just wants to blend in with the mainstream culture” (p. 25). Moreover, those who identify strongly with their heritage culture but less with the US culture would be categorized in the “separation” quadrant, while those who do not strongly identify with either the US or the heritage culture would fall in the “marginalization” quadrant. Older immigrant generations may identify as “separated” or “marginalized”. Individuals who identify as separated, “stay with their people and just celebrate their own culture” (Berry, 1997, p. 15). This tends to be the parents or grandparents of second-generation youth. Lastly, individuals who identify as marginalized “believe rewards are based on ‘luck,’ and they usually have a negative outlook on life” (p.17). It is important to note, as Berry (2003) points out, that “the portrayal of acculturation strategies was based on the assumption that non-dominant groups and their members have the freedom to choose how they want to acculturate” (p.9), and so the acculturation model is not just an individual choice. Instead, it is shaped and limited by attitudes and expectations of the dominant culture.

Berry’s Acculturation Model is important and serves as an appropriate theoretical framework for this paper in thinking about how bicultural individuals might be unique and different than those in the other quadrants. The model also serves as a guideline for identifying and categorizing Bosnian-American youth who might identify themselves within this framework.

Identity among Bosnian Americans

Though there is limited research evidence exploring the identity of Bosnian-American second-generation youth, discussion of identity is inevitably relevant to this community. Bosnian-Americans are often not included in the “European” identification compared to other popular countries as a part of the Council of Europe (Hume, 2015). Bosnian-Americans have similar ethnic recognitions that most individuals from Asian or Latin countries feel when coming to the United States.

Another factor to consider in cultural identification of Bosnian-Americans is religion, as most Bosnian-Americans identify themselves as Muslim (Hume, 2015). Recent immigration events and the media in the United States have led individuals to stigmatize this religion. Another challenge and an advantage at the same time, that Bosnian-Americans face is their appearance. Most Bosnian-Americans resemble a typical white American, which “makes it easier for this community to acculturate into the nation but makes it more difficult for this community to relate to mainstream traditions” (Hume, 2015, p.16).

In the present study, and building upon existing literature, the focus is on Bosnian-American youth involved in ethnic identity formation. Arnett (2003) explains that “adolescents’ identity formation centers primarily on how adolescents develop a firm sense of self in relation to other within their own cultural context” (p.190). This paper seeks to explore how bicultural individuals’ ethnic identity is characterized and experienced by second-generation immigrant Bosnian-American youth.

Methods

This study was an extension of an existing and ongoing research project titled, “The St.

Louis Bosnian Family and Youth Study,” being conducted collaboratively between Saint Louis University and the University of Missouri-St. Louis.

The primary method of study data collection was qualitative, in-depth interviews with Bosnian-American youth living in the St. Louis area, whose parents migrated to the United States after 1993 and as refugees. The goal of the interviews was to explore the identity of second-generation Bosnian-American youth.

All respondents first signed a consent form, and an assent form was obtained from their parents. The interviews were conducted by one of the researchers of this project. All the interviews were audio recorded and transcribed verbatim. The interview guide was semi-structured, and it consisted of questions exploring the cross-cultural experience of the respective youth. Questions focusing on answering the main research question of this study, however, focused on the identity of second-generation Bosnian-American youth, and included:

- To what extent do you see yourself as American?
- To what extent would you like your children to feel American?
- To what extent do you think Americans see you as American?
- Do you have to be born in the United States to identify with it?
- What does it mean to “be American” or “act American”?

Interviews lasted anywhere from thirty minutes to an hour. All interviews were conducted on a one-on-one basis and in the location preferred by the interviewee, such as coffee shops and/or local high schools. All interviews were conducted in English,

the preferred language of communication for this particular group.

Sampling method

Bosnian-American students were selected from St. Louis school districts such as Mehlville, Lemay, Affton, and Wilbur Park through convenience and snowball sampling. These districts were chosen because of a known high number of Bosnian students. Snowball sampling helped to expand the sample by asking informants with knowledge of the setting to identify other group members of the population (Hessey-Biber and Leavy, 2006; Babbie, 2007). We recruited respondents through several primary informants such as going to speak to specific classes in schools. We also attended different meetings and cultural programs with the hope of meeting prospective interviewees. Inclusion criteria was that the students were either in high school or first or second year of college, and that their Bosnian parents resettled in the US as refugees.

Sample

We interviewed second-generation Bosnian-Americans whose parents resettled in the St. Louis area as refugees during the late 1990s and early 2000s. This paper reports on findings from only two respondents who were interviewed, though we plan to interview more in the upcoming months. The ages of the two respondents included in this study were 13 and 18, and they were female and male, respectively. Participants were contacted via email, by phone, and/or in person.

Data analysis

Though the sample for this study was limited and responses from only two interviewees have been obtained so far, each interview was transcribed and coded. Transcription is the complicated process of

translating oral discourse to written language (Miller and Crabtree 2004, 200). We transcribed the two recordings immediately after each interview. The method of transcription included a note of any gestures, silences, pauses, stalling words, and exact pronunciation of the spelled words, as suggested by Rubin and Rubin (2005). We evaluated the interview guide to ensure that the research questions were relatable for each participant. After each transcription, we wrote a memo that summarized the critical themes of the interview. Once we finished the interview transcriptions, we coded them into different categories.

Because this study is ongoing, it is worthwhile to mention that future data analysis will include entering all the interview transcripts, interview notes, and memos into ATLAS 8.2.3, an analysis software program that allows for the coding and sorting of the qualitative data. We will develop a set of codes to evaluate the different patterns found in the interviews. From there on we will work to connect different theories with the findings from the participants. We will also identify the patterns and themes from the transcripts by grouping concepts that were labeled and then reflect on the collective mean (Rubin and Rubin, 2005). Finally, we will define each dimension of the process by using the literature review and secondary sources to begin to develop new theories.

Results

Intergenerational cultural dissonance (ICD)
Preliminary data gathered via two qualitative face-to-face interviews with second-generation Bosnian-American youth point to some initial themes important in understanding their identity. Though the data is preliminary and restricted to only two interviewees, the first prevalent and

consistent theme discussed in the interviews was intergenerational cultural dissonance (ICD), or clash between parents and children over cultural values.

For example, BFYS_128 (male, 18) explained how the work ethic between him and his parents is different. He continued to discuss how his parents wanted him to start making money for himself:

“My mom was talking to actually the other day saying that she sat down with me and said that me and you have to scrounge up some money. You got to start working a little bit harder to make your dad retired for one of the jobs, like quit one of the jobs. He’s eventually going to retire soon. So yeah, my parents are both planning on retiring but I know we’re gonna get that money from them too. But I do work but just, I just don’t that make that good money.”

As evident by this quote, there seems to be a disconnect between the expectations of parents and the adolescent in question. The parents’ goal is collective-oriented in that they see that the son as responsible for providing an opportunity for the father to quit one of his jobs, while the interviewee seems more individually-focused to where he does not feel like he earns enough to be able to help as much as needed.

Pressure to maintain own cultural identity and values

When looking at second-generation Bosnian-Americans, individuals spoke about the values they enjoyed growing up with and the ones they would like to pass on to their future children.

BFYS_127 (female, 13) explained how there are some values and traditions that she wants to keep in her life, as well as, to pass it on to her future family:

“Um, like when my parents were doing with me, um, I think being like close because we are very close and like we do go out a lot. Like me and my dad, we’d go shopping a lot. Me and my mom, like my mom doesn’t work, she has multiple sclerosis so like everyday I have off because I work full time so everyday I have off like me and her go out, we go shopping and we’d go out to and that’s something like I want to do with my kids and have a relationship with them. So, I want to maintain that.”

BFYS_128 (male, 18) discussed how he wants to be a mixture of both of his parents because the different influences that have impacted his Bosnian identity:

“Probably a mix of both because my dad, even though he does care about my school and a lot, he is really strict and I don’t really. I’m more lenient person. I don’t know. I’ve always had been, I’ve always been like a, like a playful. I’ve always been like, you know, uh, I make jokes and stuff, you know, so I’ve always been a little more childish than my dad and my dad is too serious for me. My mom and my mom’s funny but she’s, she’s a little too hard sometimes to be a mix of both.”

Ethnic enclave exists to support own cultural identity

The last emerging theme from the interviews was the existence of ethnic enclave which serves for many youths as a way of supporting their cultural identity. Bosnian-American youth “compartmentalize their lives in ways that meet the demands of both their ethnic world and the broader American society” (Liebkind, 1992, p. 50). These youths maintain ties to their Bosnian culture, but are also influenced by their friends and family who are Bosnian to adhere to ethnic values and norms in America. The youth

choose their friends, involvement with their faith, and customs (language, beliefs) to construct their identity in the United States.

BFYS_127 (female, 13) communicates with her friends and family in Bosnian, which creates a sense of community for her. She continued to discuss how her Bosnian friends play a huge role in her life because they understand the same issues she might be experiencing at home and school:

“I really didn’t like talking to adults, like adults, you know, they’re just. Especially now I do, but like when you were a kid, like they never understood. They were like, oh you’re just a kid, you’re this and this. So, my friends and me, we like always ranted and I still do like to my friends mostly I complained because they will like, you know, they won’t judge me. I think they, they might, but I don’t really care. Like they’ll at least offer me some support and some love.”

Discussion

The purpose of this study was to explore the influence of ethnic identity on Bosnian-American youth’s feelings of belongingness to partial or total affiliation with the heritage and host culture and community. Cultural identity is particularly important for understanding children of immigrant families’ development and well-being (Schwartz et al., 2006). Youth, in particular, are at a vulnerable period where cultural identity is a significant part of their overall identity and self-concept. Acculturation not only affects a person on an individual level, but it also affects the family as a unit. Each family member may acculturate at a different pace, which results in a growing discrepancy in cultural values or practices. This discrepancy is often observed between youth and adults (Berry, 2003), specifically when children tend to acculturate faster than their parents. In the traditional Bosnian

culture, parents, especially fathers, are stricter towards their children than are traditional American family fathers. This results in Bosnian-American youth perceiving their parents as cold and distant, and overly concerned about academic and financial success, as was evident by at least one of the themes that emerged in the interviews conducted for this study.

Though the sample in this study was minimal and included only two respondents, and although acculturation conflict is often a natural part of the acculturation process, it appears that Bosnian-American youth experience low levels of acculturation conflict. In other words, Bosnian-American youth do not seem to struggle with negotiating issues related to existence of both Bosnian and American cultural identity. Instead, most of these Bosnian-American families were successfully navigating the potential challenges of acculturation and finding a balance with both the Bosnian and American culture.

Moreover, individuals who grow up with other members of the same cultural background may become more aware of

ethnic and racial issues. “Ethnic enclaves provide support for an individual’s ethnic identity as a predictor of well-being among ethnic adolescents” (Yip, 2014, p. 210). The Bosnian community has clearly developed into an ethnic enclave in St. Louis, MO, that reinforces a space for parents and youth to support their cultural language, values, and traditions.

Study limitations

While this sample is too small to draw definitive conclusions from, the consistency of the three themes discussed above in both of the interviews conducted seem to be encouraging. We plan on conducting additional interviews with both genders as well as wider age range to accurately capture the identity formation of Bosnian-American youth. Other limitations of this study include the snowball sampling technique used to recruit interviewees. There is a danger of forming a homogenous sample when using a snowball technique and while this is not necessarily an issue in this study where only two individuals were included, it could be a potential limitation as we recruit more participants.

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CAN'T FIX WHAT YOU CAN'T SEE: PERCEPTIONS OF INEQUALITY IN THE VIDEO GAME INDUSTRY AND COMMUNITY

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Abstract

In this study, the questions regarding the perspectives of people about the video game industry and community are explored. Prior literature has shown that disparities of sex and gender, along with race and ethnicity, exist prevalently through the video game industry and community. This study focused on the presence or absence of diversity in gaming groups and the lack of representation or misrepresentation of women and minorities. The study also looks at the effects on those groups regarding perception of the community and personal impact. Using an online survey, this study sought to investigate any correlation between sexist and racist attitudes and their perception by different groups. This was to obtain information relating to the perpetuation of stereotypes and negative views of the video game industry and community, and possible losses because of that. The possible losses to the industry could be lack of diverse applications from these critical populations due to their experiences and perceptions, and the lack of perception from the dominant population.

Introduction

Video games have gone from an outlier of entertainment reserved for children and the less socially advantaged into a multi-billion-dollar industry within the past thirty years. Looking at pure revenue, Rob Foote writes that the video game industry is bigger than both the music and film industries combined, with 83.6 billion dollars in revenue being generated in 2014. This is compared to the 36.4 billion dollars made by the film industry, and the 15.06 billion dollars made by the music industry. Video games have evolved considerably since their inception; they allow people to explore different types of lives and stories, on a more interactive level than provided by film or television. Their online and off-line cooperation intent provides avenues of socialization and bonding across vast distances and backgrounds and allow for new ways of learning and processing information. However, seeing as video games are a human creation, they may be tainted by the negative attributes of society.

Events such as GamerGate in 2014 or controversies surrounding gaming streamers and their language during play sessions show that there is a disconnect between the ideals of gaming and the types of behaviors that take place. This study was initiated to investigate the perception of these behaviors, attitudes, and feelings within the gaming community and the wider videogame industry. The overarching research question for this study is how does the lack of representation and or/misrepresentation of women and people of color both in video games and among gamers themselves impact gaming outcomes for all in the gaming community? More specifically, does the absence of diversity in gaming networks/groups facilitate negative attitudes towards women and people of color? Also, does the lack of representation and/or misrepresentation of women and people of color in gaming communities and/or in the games themselves impact attitudes,

subjective well-being, and career interests among these groups, respectively?

Previous research in the field of social behavior and representation within video games themselves have been integral for the basis of this study. One in particular, conducted by Breuer, Kowert, Festl, and Quandt (2015) brings important information to mind. They investigated the impact of video game use on real-world attitudes relating to gender roles. Using a longitudinal methodology over 3 years, the researchers used a three-wave panel in survey form on participants in Germany. The researchers found that for both male and female participants, education negatively correlated with sexist attitudes. Age also negatively correlated, but only with the males, leading one to think that the male players became less sexist as they age. The study's main finding was that there was no significant correlation between preference of video game genre and sexist attitudes in the long-term, not necessarily contradicting previous work that found these links, because those findings mostly investigated short term views and effects. The authors also posited that cultural differences make these results difficult to extrapolate or generalize, along with the fact that there are so many different types and genres of video games.

Console first-person shooter games are a very popular source of entertainment for many gamers. As such, it is important to study the ways in which people interact within the highly competitive and high energy environments and situations that they provide. Ivory, et. al's (2017) study was focused on the actions of video game players themselves, rather than the game's possible issues. The researchers specifically focused on first-person shooters, such as *Halo: Reach* and *Call of Duty*.

This study constituted two large-scale systematic content analyses of online video game player behavior. Using different codes for the variable "utterances," (total utterances, the "seven dirty words", other strong profanity, mild profanity, total profanity, racial slurs, gender slurs, sexual orientation slurs, religious slurs, mental illness slurs, verbal aggression, direct insults, direct threats, direct accusations, direct insults, indirect threats, indirect accusations, sexual utterances, drug-related utterances, and alcohol-related utterances), the team found that profanity was high in usage, but that the number of people using racial, ethnic, sexist, etc. slurs during play was low. Specifically, 2.8% of 72 players making utterances used racial or ethnic slurs, 1.4% used a slur related to gender, and 4.2% used a slur related to sexual orientation. However, the researchers also explained that while the numbers were low in their study, a frequent gamer who is playing many different rounds with different people will come into contact with these slurs and antisocial behavior by other gamers more frequently. Finally, Ivory, et. al noted that findings could not be extrapolated to different genres, most likely because of their different goals and surrounding cultures.

Waddell, et. al's (2014) study focused on the depictions of people within video games chosen by players. The research looked at MMOs (massively multiplayer online) and representations of gender and race from various character models within four different popular video games, of the MMO genre. It is important to note that the study focuses on MMOs because of the personalization available to players. The research team also notes that players may have different goals in mind when customizing their avatars, with gender bending being an evident factor. Waddell,

et. al notes that players rates of gender bending differ between games, from 15% of users in *EverQuest* (Huh & Williams, 2008) to more than half of all male players in *World of Warcraft* (Hussain & Griffiths, 2008; Yee, Ducheneaut, Yao, & Nelson, 2011). The research team states that research shows reasons varying from “standing out” Ducheneaut (2009) to simply wanting to see an idealized version of themselves. The investigator’s research questions were: “RQ1: How frequently are male and female characters represented across massively multiplayer online games? RQ2: Does the representation of male and female characters vary between massively multiplayer online games? RQ3: How frequently are different ethnic groups represented across massively multiplayer online games? RQ4: Does the representation of ethnic groups vary between massively multiplayer online games?”.

Waddell, et. al’s (2014) research methods included recruiting five undergraduate students from a student gaming organization, who were then randomly assigned to play two out of the four MMOs (*World of Warcraft*, *Guild Wars*, *Dungeons and Dragons Online*, and *RuneScape*) the research team selected. They coded four variables in particular: gender (male, female, not applicable), race (white, black, Hispanic, Asian/Pacific Islander, Native American), number of appearances, and character type (another game user or an NPC). They found that characters without an apparent gender made up 23.74% of the total number. Of the 318 characters left, 82.08% were male and 17.93% were female. Between games, however, gender representation tended to differ, but with all showing a majority of male characters. Most of the characters who were of a human race were white, representing 43.41% of all unique characters, while black characters were at

3.84%, leaving non-human racial representation at 52.75%. Racial representation across games differed, but still left white representation with the bulk of appearances, never dipping below 30% of unique characters and 18% of total appearances. Overall, Waddell, et. al found that MMO characters tended to be male and white, similar to research on console games. Also, the only racial minority represented at all was black. They also compared representation to data on players and found that the distribution does not line up. Non-human characters were found to be more common than female or non-white characters as well.

These studies, and their information helped to form the following hypotheses:

- **H1-** Diversity in gaming groups will have a negative correlation with racist or sexist attitudes.
- **H2-** Perception of representation in the video game community and/or industry will positively correlate with feelings towards the gaming industry and community.
- **H3-** Feelings of the industry and community will positively correlate with the amount of time invested into the playing of said games.

Methods

Participants

Participants were between the recorded ages of 18-48 years of age, recruited through mostly social media advertisement on the platforms, Twitter, Facebook, and Snapchat in a version of snowball convenience sampling. None of the participants were given credit or payment for their participation.

In this study, 65 (N=65) responses in total were recorded. However, the actual number

of respondents' data used was 42 (N=42). This data exclusion stemmed from the non-validity of the remaining 23 (N=23) for the following: not playing video games, not being of the target age (18-89 years of age), and not completing the survey in totality. Most respondents were Caucasian/White at 57.1% (N=24), Black/African American at 33.3% (N=14), Native American at 2.4% (N=1), Asian/Pacific Islander at 7.1% (N=3), Hispanic/Latinx at 4.8% (N=2), and Other at 7.1% (N=3). Most gamers tended to play video games on PCs, Playstation 4, Tablets/Mobile Devices, and Handheld Devices (Playstation Portable, Nintendo DS, etc.). Respective means for each were: 0.68, 0.38, 0.38, and .031.

Measures/Materials

The materials used in this study were provided via the Qualtrics online survey hosting system. The primary variables included in this study were gaming habits and preferences; racial attitudes (feeling thermometers on racial groups); sexual attitudes (attitudes towards women); and perceived diversity (gaming group/gaming industry). In addition to these variables, measures on self-esteem, thriving, perceived inclusiveness and a variety of demographics (e.g. race, sex, age, education, income) were also included.

Results

For **H1**, no statistically significant correlations were found between a gaming group's diversity and their attitudes towards different minority groups or towards women. However, while the correlations were not statistically significant, there was a positive correlation for group diversity and feelings towards Hispanic/Latinx ($r = 0.24$, $p > 0.05$, $N = 32$), Asian/Pacific Islander ($r = 0.32$, $p > 0.05$, $N = 32$), Caucasian/White ($r = 0.09$, $p > 0.05$, $N = 32$), and Native American people ($r = 0.16$, $p > 0.05$, $N =$

32). There was an observed negative correlation between group diversity and attitudes towards black people ($r = -0.00$, $p > 0.05$, $N = 32$), and women ($r = -0.24$, $p > 0.05$, $N = 32$).

Within **H2**'s findings, there were a few statistically significant correlations. Gamers of color had a significant correlation between feeling as though their race was represented both in within games and the gaming industry, with thoughts of the gaming industry's overall diversity. ($r = 0.78$, $p < 0.05$, $N = 20$) and ($r = 0.78$, $p < 0.05$, $N = 20$). White gamers however had a negative correlation between these variables, however the findings were not statistically significant. Also, the correlation between whether the industry was doing a good enough job showing different types of people within their stories and gamers of color perception of their race in both games ($r = -0.77$, $p < 0.05$, $N = 20$) and the industry ($r = -0.77$, $p < 0.05$, $N = 20$) was negatively correlated.

On the basis of sex, female gamers had a statistically significant positive correlation with both their sex being represented within games and feeling that the gaming community was diverse ($r = 0.62$, $p < 0.05$, $N = 17$) and their sex being represented within the gaming industry and feeling that the gaming community was diverse ($r = 0.49$, $p < .05$, $N = 17$). The correlation for their perception of representation both in the gaming industry and community was positively correlated with feelings of the video game industry's diversity, however the results were not statistically significant. Male gamers in general had slightly negative but statistically non-significant correlation between their views on gaming industry diversity and their sex being represented in games ($r = -0.02$, $p > .05$, $N = 23$) and a positive yet also not statistically significant

correlation between their sex being represented in the gaming industry and thinking that the gaming industry was diverse ($r = 0.25, p > .05, N = 23$).

Similar to the second hypothesis, **H3** was surveyed on the basis of sex, but not race. For male gamers, there were no statistically significant correlations. Between thoughts on how diversified the gaming industry was and the amount of gaming sessions (all genres combined) per week there was a positive correlation with a score of ($r = 0.05, p > .05, N = 23$). For the gaming community and amount of gaming sessions, there was a negative correlation, with a value of ($r = -0.29, p > .185, N = 23$). There was a positive yet also non-significant correlation between thoughts on the efforts of the gaming industry diversity within their stories and the amount of gaming sessions per week, with a value of ($r = 0.26, p > 0.05, N = 22$). For female gamers, all correlations between feelings on the video game community and industry regarding diversity and representation and amount of gaming sessions per week, were all not significant, and all negative. In the same order as the correlations for male gamers, values were: ($r = -0.26, p > 0.05, N = 17$), ($r = -0.09, p > 0.734, N = 17$), and ($r = -0.08, p > .05, N = 17$).

Exploratory Findings

Along with the main findings of the study, there were other observations to note in the research proceedings. When responding to the question “How often do you hear racial, ethnic, or sexual insults during play sessions,” respondents answered with a mean score of 2.71. This is based off a 1-5 scale, which indicates that these epithets are heard just a little more than half of the time by our participants during play sessions. Most of these insults tended to be within the first-person shooter genre, with a mean

score of 0.62. The next highest were the action and fighting genres, with mean scores of 0.24 and 0.19 respectively.

Discussion

Major Findings

H1: With the current data, it seems as though having a more diverse group of friends/co-players to play video games with improves with feelings towards most critical groups (save for black people and women).

H2: Gamers of color tended to have more positive views on the video game industry’s total diversity, if they also felt as though their respective race was represented in the video games themselves, and within the gaming industry. However, the perception of race in both negatively correlated with feelings about if the industry was doing a good enough job exploring diverse casts for their stories. White gamers had negative correlations between the variables of perception of race in games and the industry, and thoughts on the industry’s total diversity. However, these results were statistically non-significant. On sex differences, female gamers had a significant positive correlation between perception of sex in the gaming industry and thoughts on the gaming community’s overall diversity. This leads the research team to assume that the higher the perception of sex in the industry, the higher the thought that the community is also generally diverse. When speaking about male gamer trends, they tended to vary and contradict one another, with most stats being non-significant, and varying in views of the gaming industry in both positive and negative directions.

H3: The third hypothesis primarily focused on investigating any correlations between the amount of gaming sessions and views on industry efforts for diverse characters in stories, along with views of general diversity

within the industry and games themselves. Male gamers had two positive correlations; for industry, general diversity and efforts for diversity in stories. However, there was a negative correlation for gaming sessions per week and general diversity in the general gaming community. Female gamers had negative correlations for all three variables, showing a difference.

Explanations

Explanations for the current findings of the hypotheses tested include:

H1: Overall, there seemed to be a positive correlation (non-significant) between gaming group diversity and feelings towards minorities. However, attitudes towards Black people and women were negatively correlated (also non-significant) with gaming group diversity. Assuming that gaming group diversity encourages growth, tolerance, and understanding of different groups is safe to say here, and with more data, the negative correlations are hypothesized to become positive.

H2: While observing the data from the testing of **H2**, the research team could not explain the differences in correlations between race, perceptions, and attitudes. Specifically explaining the negative correlation between perception of race within the video game community and industry, and thoughts about how well the industry was doing to include more diversity in its stories, it could be theorized that gamers of color possibly could see themselves within the gaming community and industry, but still sense a significant lacking within the video games' stories. However, this theory would not really hold up with increasing numbers of game developers or community members of color correlating with a decline in attitude or thought towards the industry's diversity

efforts for its stories. Male gamers conclusions were also contradictory, along with white gamers. For these reasons, explaining the findings is not deemed warranted or appropriate at this time. Female gamers had a significant positive correlation between the view of their sex being represented in the gaming industry and diversity perception of the overall community. This could be explained by female gamers extrapolating their vision of more female gamers being active within the community into more female game developers being in the industry, or vice versa.

H3: Female gamers, overall, had the most consistent findings, with negative correlations (while non-significant) along with gaming sessions per week. The hypothesis here is that increased exposure to an enjoyable hobby like gaming would make female gamers more aware of the lack of women within all three of these realms, which would contradict the offered explanation for the previous hypothesis regarding female gamers. This shows that more data needs to be collected for more conclusive evidence. Male gamers, however, had more contradictory findings. The negative correlations, however, might be explained by a noticed increase in diversity of cast in video games and members of the industry through increased or more prolonged contact with games themselves. The assumption here is that a move from the standard (white males) is more perceptible or the definition of what quantifies as "diverse" differing between white gamers, and gamers of color.

Strengths and Limitations

Because of the low number of respondents, any correlations or results found at this time are deemed to have low statistical power. Also, this low number makes the findings

un-generalizable for the entire population of gamers. For example, at this current time, there were three non-binary respondents, three Asian/Pacific Islander, one Native American, and two Hispanic/Latinx. Also because of the small sample size, dividing the responses by sex, gender, and race/ethnicity showed for very few correlations with other variables or gave correlations that were difficult to interpret. For example, there was a negative correlation between respondents of color's life satisfaction and their perception of their being represented in the video game industry. However, there was a significant positive correlation between life satisfaction and respondents of color's perception of their sex being represented in the video game industry. Seeing as this data comes from respondents of color, and based off of anecdotal descriptions, one would be led to believe that gamers of color would find their life satisfaction rise or fall with their perception of their respective race being involved in the creation of video games.

Implications and Applications

Seeing as this study is still currently developing, it would be disingenuous to say that the current findings have real implications or applications. However, if many of the correlations that have been found in this iteration hold with a larger survey population, then there may be something to explore then.

Future Research

For future researchers, changes or additional questions about peoples' experiences while gaming may be sufficient. Also, a distinction between game developers responding to the survey, and gamers who do not develop games, may be suggested. Participants who dropped out of the survey tended to do so around questions regarding number of hours and number of gaming sessions a week they

had. Participants were asked to indicate these numbers themselves with individual numbers. Providing respondents to choose between a range of different times/number of sessions per week for video games may help to improve dropout rates of the study.

Conclusion

Video games have become an extremely important factor in peoples' entertainment and socialization. Due to their variety and interactivity, they are a definitive vector for the transmission of knowledge as well. While video games have their benefits, it is worth investigating how negative behaviors between people may be amplified or given a platform within these digital spaces. Along with large and mostly anecdotal controversies, previous research has concluded that sexism, homophobia, and racism do unfortunately taint the online world for gamers and may possibly be a bar for minorities and women to enter the video game community and development industry. This study sought to obtain information from gamers of all different backgrounds and their own thoughts and perceptions on these various behaviors and habits of both community members and the industry itself, in order to see if there are noticeable discrepancies in how critical populations (women and minorities) and dominant populations (white males) view these issues, or if they are even perceptible to them. As time progresses, more responses will be collected and added to the data pool, so that there may be more consistent results with better statistical power.

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EXAMINING THE TRAUMA RELATED HEALTH EFFECTS OF POLICE BEHAVIOR ON BLACK COMMUNITIES

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Abstract

This research study intends to explore the ways that police violence and over-policing in predominately black, low-income communities impacts trauma related health outcomes among individuals in those populations. The historical and political context of criminalization of black people which operated through slavery, Jim Crow, and mass incarceration will be discussed and paired with the current, and rampant, form of criminalization which is police brutality. The cultural norms that perpetuate a perceived police culture and implicit bias along with the social connotations of black males are expressed to contextualize the occurrence of police violence and to frame contemporary discussions of policies and practices that engender police behaviors and their negative health effects. Research questions pertaining to the relationship between police violence and health will be addressed and assessed utilizing a qualitative, meta-analytical methods.

“Trauma events call into questions basis human relationships. They breach the attachment of family, friendship, love, and community. They shatter the construction of the self that is formed and sustained in relation to others. They undermine the belief systems that give meaning to human experience. They violate the victim’s faith in a natural or divine order and cast the victim into a state of existential crisis.”

–Judith Lewis Herman 1997

Introduction

The idea of trauma is centered in the forefront of many violent acts done unto individuals in society. The mental effects are considered in terms of sexual abuse survivors, child abuse survivors, and other considerably vulnerable populations. Likewise, children that survived the Newtown, CT shooting were evaluated by mental health professionals (Bryant-Davis, Adams, Alejandre & Gray, 2017). This demonstrates the capacity to understand how an event such as what children in Newtown endured has a traumatic impact that commands a specific approach to healing and treatment. Moreover, there are different levels of trauma that have the ability to impact individuals and communities. Trauma exists and manifests on a community level, as well as individual, and

it involves social-cultural, physical/built, and economic environments (Davis, Pinderhughes & Williams 2016).

However, regarding cultural and societal mechanisms of oppressions that lead to trauma, specifically black men and fatal interactions with police, research has barely scratched the surface (Bryant-Davis et al., 2017). The issue of the negative relationship between Black individuals and police officers are well-documented and have been highly publicized within the recent decade. There is a gap in the public health response to the trauma caused to black men by way of police violence in communities. The idea of trauma is understood in many contexts, but needs improvement when considering conditions prevalent within members of

certain social groups. Reported by the Health and Human Services Office of Minority Health, when compared to the general population, blacks are 20% more apt to face mental health problems (Office of Minority Health, 2016). Furthermore, there have been significant findings illustrating that mental issues like PTSD and depression exist at a higher prevalence in low-income black urban neighborhoods than in other places (Smith, 2014). This illustrates the trauma unquestionably present in black communities, and this paper seeks to argue that historical realities (such as slavery and Jim Crow) and policy decisions (such as the National Housing Act and the War on Drugs) have created situations in which certain communities are majority black, low-income, and perceived as high crime. This reality subsequently sets up a situation in which these communities are over-policed, leading to more and more interactions between police and community members, too many of which are fatal.

The concept of policing evolved out of the slavery era to be a form of social control over blacks and continues to exist in a similar function (Bass, 2001). The types of policing tactics employed are dependent on a variety of factors and the outcomes of police interactions with Black individuals oftentimes illustrate the types of intentions held by officers. Policing methods have become highly scrutinized as there has been a slew of black individuals—men, women, children, unarmed, armed—that have been subjected to police violence that leads to severe injury or even death at the hands of police officers. Structural forces such as policy are mechanisms that allow for bad policing tactics and behaviors, such as racial profiling and implicit bias, to exist in certain neighborhoods. Consequently, these lead to experiences of trauma by black men in highly segregated and low-income

communities which have health consequences.

Understanding Trauma

As was discussed previously, there are different types of trauma. As defined by SAMHSA (Substance Abuse and Mental Health Services Administration), which is a department of the US Department of Health and Human Services, “individual trauma results from an event, series of events, or set of circumstances that is experienced by an individual as physically or emotionally harmful or life threatening and that has lasting adverse effects on the individual’s functioning and mental, physical, social, emotional, or spiritual well-being” (SAMHSA, 2014, pg. 7). This definition offers insight into the impact that trauma can have on an individual without even considering what type of experience led to the individual’s traumatic feelings. Recently, there has been a drive to explore the concept of community trauma. In a publication from the Prevention Institute, community trauma is described as a conglomerate of different aspects in the community environment, namely people, place, and equitable opportunity (Davis, et al., 2016). Utilizing a community trauma framework is beneficial because it compounds experiences that may not necessarily have to do with an individual, but more the circumstances in which individuals are a part of. Furthermore, many aspects of community trauma See Figure 1 for a visual graphic of these components to community trauma.



Figure 1. This graphic displays the three “symptoms” (components) that the Prevention Institute considers in terms of community trauma. Obtained from Davis, R., Pinderhughes, H., & Williams, M. (2016). Adverse Community Experiences and Resilience: A Framework for Addressing and Preventing Community Trauma. Prevention Institute. Retrieved July 26, 2018.

This model is very relevant considering that while individual trauma is important, people are impacted by circumstances and situations that do not have to do with them directly, but rather as consequences of policy choices and other implementations over the years. For example, the “unhealthy products” portion of the place aspect of community trauma can refer to the fact that some neighborhoods are considered food deserts, meaning that they do not have access to healthy and fresh foods, but a plethora of convenience stores and gas stations that offer choices that lack nutrition (Davis, et al., 2016) Additionally, the equitable opportunity refers to the fact that there are limited options for people to seek employment in certain neighborhoods which contributes to high unemployment levels and high poverty levels.

In order to help conceptualize what individual trauma means, it is helpful to think about the three E’s of Trauma framework that SAMHSA developed. The E’s are Events, Experience of Events, and Effect (SAMHSA, 2014). The event refers to the actual circumstance that threatens physical or psychological wellbeing. The experience part can be an indicator of if the event was traumatic or not. One specific event can be considered traumatic for one person but not for another and that shows the relative and personal nature of trauma. Experience can be shaped by how a person

is emotionally and how they utilize support. The Effect part of the trauma framework deals with how a person responds and act after an event occurred. That includes how a person is able to continue with their day to day life experiences and relationships and connections (SAMHSA, 2014).

Historically, there have been certain time periods that have been traumatic for black Americans. For example, both the periods of slavery and Jim Crow caused high levels of stress and anxiety for individuals. The idea of being taken from a comfortable place to be forced to work in inhumane conditions and oftentimes be separated from family takes a toll mentally. The Jim Crow period also brought about stress and anxiety due to segregation in all aspects of life that prevented black Americans from achieving upward social mobility. The strong presence of racism was also a source of trauma. Along with these two historical events there are also specific policy decisions that created low-income Black communities, which set the stage for further opportunities for trauma to exist in these communities, putting them at a higher risk.

Creation of Low-income Black Communities

One cannot attempt to analyze the concept of racial oppression within American society without considering social and historical structures that contributed to such oppression. The existence of majority Black communities, and those that are also low-income, are products of decades of legislation rooted in racism and one specific policy is the National Housing Act of 1934, which is how the Federal Housing Administration (FHA) came to be created (Gotham, 2000). The FHA handled mortgages and loans, and used the practice of redlining along with guidance from its *Underwriting Manual*, which culminated in discrimination against blacks at the time

(Voborníková, 2014). Redlining involved various designations given to different neighborhoods based on certain factors, predominantly race. These designations would be compiled to a map that represents the different areas of the city. As cited by Kevin Gotham, there were four levels that could be assigned to neighborhoods. The highest distinctions were given to new, all white neighborhoods and lowest distinctions given to both neighborhoods near a predominantly African American community, or the predominantly African American communities themselves (2000). The highest distinctions were green and the lowest were red—hence *redlining*. The great importance of these distinctions between neighborhoods was how the loans were dispersed to residents in these different areas. To provide evidence about the dispersal of loans, an article reports that between the years of around 1930s to 1959, a majority of the FHA insured houses were located in the suburbs. Additionally, of those homes, less than 2% were made out to African Americans (Gotham, 2000).

Moreover, income and crime seemed to act as a proxy for race. The idea of “proxies” for race allow for policies to be racially motivated without ever admitting that. As an example, eventually conditions in the red and undesirable neighborhoods (as classified by distinctions in the Underwriting Manual by the FHA) got worse and worse. In basic terms, the phenomenon of federal funding being continually funneled in to white and more prosperous communities set a precedent and, as Gotham cites, these acts based in racism and discrimination powered a perception that it is necessary to include racism in all aspects of housing, especially funding mortgages (2000). Perhaps the political and racial climate in America created circumstances in which the poor were relegated to inner city slum-like areas.

Due to political bodies like the FHA, these areas got poorer and more destitute, embodying conditions that are consistent with cultural support for policing in urban areas stemming from societal fear.

Another political tool that helped lead to the practical demise of black communities was the War on Drugs. The racialization of drug use is an effect of the attitudes and policies towards drug use of this time period, not a particular provision of the 1994 Crime Bill. This racialization came in the form of a difference in sentencing outcomes of crack versus powder cocaine due to the Anti-Drug Abuse Act of 1986. In the New Jim Crow, it is stated that there were many harsh penalties imposed by this legislation—the most relevant to this paper being that there were mandatory minimum sentences for distribution of cocaine: with much more intense punishments for distribution of crack than cocaine (Alexander, 2010). The difference in sentencing was a 100:1 ratio; meaning that individuals that sold crack were given sentences much longer than those that sold cocaine. Using an example from The New Jim Crow, “a conviction for the sale of five hundred grams of power cocaine triggers a five-year mandatory sentence, while only five grams of crack triggers the same sentence” (Alexander, 2010, p. 112). Crack cocaine and powder cocaine are virtually the same drugs. They are chemically identical but differ in the ways that they are taken by users and also, the effects are slightly different. The book goes on to mention that crack is a vaporized form of cocaine that can be inhaled for a faster and more intense high using less of the drug. For this reason, it was very common for small doses of crack to be sold, making the prices much more affordable (Alexander, 2010). The relevance of this disparity in sentencing for these different drugs elicits a disproportionate effect on the

African American community. According to a report by the United States Sentencing Commission, 88.4 percent of the individuals that were convicted of federal crack offenses in 1995 were African American and only 4.5 percent were White (United States Sentencing Commission, 1995). This statistic shows that not only were African Americans convicted of crack at a higher rate, they were also dealt harsher sentences. Subsequently, Black people were more likely to be imprisoned and for longer periods of time, too.

A major critique of this policy is the way in which it contributed to the criminalization of African Americans. The incarceration rates did not begin to increase due to this bill; however, the existing situation was exacerbated by the previously mentioned provisions put into play by the bill. It has been discussed that African Americans were much more dramatically affected than whites. The reality that the criminal justice system targeted African Americans led to a widely accepted perception of black people as criminals. Besides the disproportionate number of African Americans in prisons around the nation, black people were also criminalized in the media. Some researchers have connected exposure to Black criminals in the news with linking Blacks with crime (Dixon & Azocar, 2007). The effects of this connection with blackness and crime arise time and time again. Although African Americans comprised only 15 percent of current drug users in 1995, a survey published in the *Journal of Alcohol and Drug Education* reported that, when asked to imagine a drug user and describe their appearance, 95 percent of people pictured a black drug user and 5 percent of people imagined a drug user of a different race (Alexander, 2010, p. 106). There was a false narrative being created about African

Americans and the media and law enforcement were enabling it.

Policing in Low-income Black Communities
When considering how policing occurs in low-income black communities, it is important to consider what policing behaviors and practices are considered good or bad. One policing practice that is considered good is when police departments exhibit community engagement. A majority of community members want their voices to be heard and taken into consideration when police departments are making reforms. As a publication from HERE states, 73% people said they would be very likely to provide feedback on department policies and practices (Policing Project, n.d.). This shows that community members realize the influence that police departments have on day to day life and that they want to be involved in making changes. Another would be community policing. It is the idea of a police department that is more connected with the community and aware of the needs and issues existing within the community (Micucci & Gomme, 2005).

On the other hand, bad policing practices are those that encourage trauma filled experiences. One bad policing practice is lack of a standard for psychological evaluations to be completed by police officers. Being a police officer is a job in which an individual is placed in high-stress situations each day, and it is necessary to ensure that police officers have the skills and mental capabilities to do their jobs properly. Another bad policing practice is cop culture. It includes culture norms that police rely on to do their jobs. It is based on the hierarchy and chain of command that exists in police departments. Police officers that may try to act justly and report certain incidences can end up being shunned and

ostracized for being disloyal (Micucci & Gomme, 2005).

The reliance on cultural norms is a major driving force in terms of what is perceived as a danger or threat to a police officer—and these norms are based in experiences from their work.^{x5} When officers come to the job with their own preconceived notions combined with potentially biased information they learn when they begin training, the formation of “bad policing” tactics ensue. Excessive use of force is one mechanism through which police brutality thrives in American society. It has been defined as “the use of any force that is beyond what is necessary to control an individual or effect the arrest of a suspect, including the use of any force when none is required” (Hays, 2011, p. 5). Civil rights complaints filed regarding excessive use of force are more prevalent among Blacks and Latinos than Whites (Micucci & Gomme, 2005). This question the manner in which force is imposed onto individuals. While Blacks and Latinos are not inherently criminal and deserving of excessive use of force, there is a gap in reality and police officer perception. These perceptions may be influenced by implicit bias, which is another mechanism through which police brutality endures.

Implicit bias is defined as “attitudes or stereotypes that affect our understanding, actions, and decisions in an unconscious manner” (Kirwin Institute, n.d.). Determining implicit bias can be difficult due to the fact that it is not easily measured and also because people may not realize that their actions are being driven by an underlying bias that leads to disparities in the way people are treated. Moreover, the practice of implicit bias can lead to individuals being unfairly racially profiled. Racial profiling can be described as

targeting a person and criminalizing them based on physical characteristics like race or nationality. (ACLU, n.d.). An example of profiling is illustrated with the practice of “stop and frisk”, which is when police officers who believe that an individual is acting suspiciously stop a person without needing a probable cause and search them (Sewell & Jefferson, 42). This practice is especially problematic because 9 of 10 stops involved either black or Latino individuals and overall, black individuals were stopped more frequently than white individuals (Sewell & Jefferson, 42). A black male in a qualitative study investigating traumatic stressors recalled his experience with being harassed and profiled by police stated: “police officers? ... I feel like they just like to look at everybody on the streets as demons ... They’ll pull you over for no reason ...” (Rich 2005). This displays the demonization that black men feel in terms of how police officers view them.

Conclusion

Trauma exists on many levels and can manifest in different ways in a person’s life. People can experience individual trauma, community trauma, and intergenerational trauma. It is important to consider how they work together to understand how an individual may perceive an experience as traumatic. The implications of certain parts of history are very important to the creation of low-income black communities that still exist today. The National Housing Act effectively segregated many cities in the nation, and led to poor, economically depleted inner-city areas and wealthier suburb areas. Additionally, the War on Drugs contributed to criminalizing black individuals and communities and provided police officers with a reason to deem areas high-crime and thus over police them. These events were traumatic themselves, but also they created the current situation where

there are low-income black communities that are over-policed, leading to traumatic experiences that have negative health consequences.

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POLICY, PERCEPTION, REALITY: CURRENT DISCOURSE SURROUNDING MIGRATION IN FRANCE

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Abstract

Beginning in 2014, a large wave of migrants arrived in Europe. The number of arrivals peaked in 2015 creating what is still being referred to as a migrant crisis. This wave concerns multiple states of the European Union, including France, which will be the focus of this paper. In February 2018, Gérard Collomb, then French Minister of the Interior, submitted to parliament a new law project titled “For a Controlled Immigration and an Effective Right of Asylum” with the goal of tightening security and the procedures surrounding immigration and asylum. The proposed policy, mostly supported by the political right and center, comes with many drawbacks that will impact France as a state, particularly how it treats and receives migrants and refugees. In my project, I examine the policy itself, but contend that the policy is built on misconstrued perceptions. Using a variety of sources, with a high emphasis on governmental websites and media sources, I focus on the gap in the portrayal of those arriving and the reality. I use both neutral and sources with different political biases, in order to assess how different stories were proposed to the public. This included checking the media’s website daily during the duration of the program and analyzing visual data from French and European projects about the demographics of arrivals.

Key words: migrants, refugees, immigration, France, migrant crisis, Gérard Collomb

“My third year as an undergraduate at Saint Louis University was spent studying at the university of Lyon 2 in Lyon, France. Lyon’s biggest train station, Part Dieu, sits in front of the biggest commercial center in the city. The most convenient stop for the train to and from the airport is at Part Dieu. This part of town teems with life from both tourists and locals, and is more industrial than the rest of the city due to the type of businesses it hosts and its architecture. About two blocks away from this hub, was a tent city, inhabited by migrants. In October 2017, this tent city was destroyed by police. Since the migrants’ irregular situation, not having stable housing or income, worsened, students of Lyon 2 mobilized. They stormed and took one of the amphitheaters for the migrants to have a temporary roof. Due to the malaise of some students, the president of the university, Nathalie Dompnier, tried to maintain transparency about the situation. However, it was not a feasible solution for the migrants to continue staying in the amphitheater, and they were asked to leave before the end of December. Some migrants, having no other options, rebuilt the camp, only for it to be destroyed multiple times, the last one documented by Le Progrès in February 2018. I was not able to find a conclusive answer to what happened to these migrants. Of 149 that were evacuated at one point, only 55 found refuge in a gymnasium. Even then, it was not conclusive how long they could, and did, stay there.”

Introduction

France has always been a destination for immigrants and refugees due to its geographical location; in the northern hemisphere and in the middle of Europe. It attracted people from Spain and Italy in the last century, to most recently people from Syria and Libya. Currently, France is experiencing mass migrations, which is also being called a migrant crisis. The severity of the “migrant crisis” is partly distorted by the media. Thus, many questions on how to best handle the flux of migrants and corresponding asylum policies have been raised.

The first step in untangling perceptions, policy, and reality is to define the terms used. The thin, blurred line between migrants, refugees, and asylum seekers must also be recognized. The United Nations Department of Economic and Social Affairs (UN DESA) says that an international migrant is someone who changes his or her country of residence, irrespective of the reason for migration or legal status, although there is no formal legal definition of an international migrant (Definitions | Refugees and Migrants). In simpler terms, a migrant is someone who leaves their country, no importance given to their status and they can be documented or undocumented. UN DESA distinguishes migrants in two ways: short-term or temporary migration, covering movements with a duration between 3 and 12 months, and long-term or permanent migration, referring to a change of country of residence for a duration of one year or more. A refugee, per the 1951 Geneva Convention and the United Nations High Commissioner for Refugees, is a person who is outside their country of origin for reasons of feared persecution, conflict, generalized

violence, or other circumstances that have seriously disturbed public order and, thus,

require international protection (Definitions | Refugees and Migrants). It is someone whose government cannot, or will not protect them. The distinction between a refugee and an asylum seeker should also be noted. Where a refugee has the host country’s approval, an asylum seeker does not. For example, most migrants who cross the Mediterranean in rafts are asylum seekers; the migrants must ask for protection, or asylum, when they arrive to a country.

The “migrant crisis” raises demographic questions surrounding race and religion. The new wave of migrants and refugees is not predominantly white or Catholic, as previously experienced waves, such as the Spanish or the Italian migrants of the 20th century. Although France is a secular country, many of its religious citizens are Catholic (Statistiques). France treats its society as if it were post racial, as if racial discrimination were eradicated from its society, however, time and time again racial discriminations are brought to light. Multiple government campaigns have been promoted to combat racial discrimination in the last ten years, such as the High Commissioner for the Struggle against Discriminations and for Equality⁴ (Vie Publique).

Finally, connected to the demographic questions concerning race and religion, is the role of the migrant crisis plays in France’s party politics. During the last presidential election in 2017, France came close to electing a far-right candidate, Marine Le Pen from the party then-called The National Front⁵, whose platform

⁴ Haute Autorité de Lutte Contre les Discriminations et pour l’Égalité

⁵ Le Front National

centered on closing borders, which would maintain a pure French identity. These kinds of nationalistic sentiments can be dangerous, not only on the national, but also on the European level. Other countries in the European Union, such as Italy, are also experiencing waves of extreme conservatism.

The slippage of terminology, the constant questioning of who is a migrant and who is “French,” the presidential election and the current political tension between right and left, give a rich context for the push for immigration policy reform. There is a disconnection between the policy proposed in 2018 and the media perceptions, especially in regard to the reality of the migrant’s origins. The disconnections are the focus of my project. Here, I examine the policy itself, but contend that the policy is built on misconstrued perceptions.

Current Policy in France

The recent “migrant crisis” comes from the large waves of migrants that began arriving in 2014. These migrants are coming from Sub-Saharan Africa, North Africa, or the Middle East (Missing Migrant Project). Many of these migrants are asylum seekers who risk their lives and cross the Mediterranean Sea in dangerous rafts to reach Europe. They are leaving war-torn countries or persecution. Laws have been proposed and European Union summits have been held to try and solve the issue.

In February 2018, Gérard Collomb, at that time the French Minister of the Interior, submitted to parliament a new law project titled “For a Controlled Immigration and an

Effective Right of Asylum”⁶ with the goal of tightening security and the procedures surrounding immigration and asylum in France. The bill passed in both the Senate and the National Assembly⁷. It is worth noting that the bill passed with a significant amount of approval in both branches of Parliament. In the National Assembly, we see a centrist block, since at this point of the bill’s life, right wing parties did not think the bill was strict enough. On April 22, 2018, the National Assembly voted 228 in favor and 139 against, with 24 abstentions. The Republic Moving Forward⁸ (LREM), and the group Union Democratic Independents⁹ and Agir Independents, were those who voted for the law project. LREM is the current French president Emmanuel Macron’s centrist party. Right wing parties, such as the Republicans, along with left wing parties like the Insubordinates, the Socialists¹⁰, had the largest numbers of votes in contrary. The bill passed on to the Senate to be voted on June 22, 2018. In the Senate, we also see a similar centrist block of support, however, more right-wing delegates voted for its approval. The Senate amended and tightened the bill, thus gaining support from right wing party, the Republicans, who made up 140 of the 197 voting in favor. The bill kept support from LREM, and the Centrist Union while at the Senate. 139 delegates voted against the bill in the Senate. The majority of these delegates came from the Socialist party, the Eco Communists. Some Republicans voted against the bill because it was not strict enough, even with the amendments from the Senate. Since the Senate amended the bill, it needed to go back to the National Assembly for a reviewing session and then voted on again.

⁶ *Projet de loi pour une immigration maîtrisée et un droit d’asile effectif*

⁷ Parliament names, Sénat and Assemblée Nationale, have been, and will continue to be translated for the reader.

⁸ *La République en Marche*

⁹ *UDI Agir-Indépendants*

¹⁰ *Les Républicains, Les Insoumisés, Les Socialistes*

This next vote was supposed to happen on July 25, 2018, however, it was postponed until August 1, 2018. 75% of the National Assembly- a clear majority- voted in favor of the bill (Rescan August 2 2018). The National Assembly's vote was its definitive vote, thus accepting the bill to be implemented. As of September 6, 2018, the Constitutional Counsel has accepted that the bill be added to the constitution. It will be applied to article 61, line 2 of the French constitution (Senat).

It is important to note the changes made to the proposed bill, standing regulations and why it has gained so much media traction. The goal of the bill, as the title suggests, it to "control immigration," and it plans to do this by on the one hand, facilitating the expulsion of rejected asylum seekers and on the other, facilitating the integration of the asylum seekers accepted.

These are the proposed changes¹¹:

- Expedite the asylum application deadline from 120 days to 90
- Reduce the investigation of asylum seekers to 6 months
- Limit medical assistance to "sans papiers" (undocumented)
- Against reuniting families if only the minor was accepted
- Against right of work for those seeking asylum who have been waiting for 6 months

- Délit de Solidarité (solidarity crime): punish those who help migrants cross into other EU states.

Although some of these proposals seem to favor migrants' rights, the proposals come with a hidden potential to do harm. For example, reducing the times for applications and investigations limits a person's

opportunity to appeal their case. The same applies for "expediting" the application deadline. Seekers have less time to appeal and a bigger chance of being detained and deported. Limiting medical assistance to the undocumented is a reason why humanitarian organizations have condemned the bill. The last proposal, solidarity crime, includes a criminalization of borders. I found this to be in line Donald Trump's rhetoric, in the sense that border crossings will be criminalized, and those who help anyone migrate will also be affected, along with the unwillingness to reunite families (Florida).

Other changes in a broader European Union sense include a recent Migration Summit, on June 29, 2018. Overall, many of the details were not publicized. However, control and screening centers were something that were most agreed on and the important take-away. Control centers would be built in first arrival countries, which are countries where migrants first arrive, such as Italy or Greece. France has said that they will not build any control centers since they are not a first arrival country. The screening centers are meant to limit the power smugglers hold thus lowering death numbers. However, humanitarian organizations have condemned the centers, amongst them, Doctors without Borders (Erlanger). Humanitarian organizations have said that the centers would negatively affect the migrants since they would have a higher chance being trafficked by smugglers, especially in countries like Libya. Screening centers would be located in a third country, such as Libya, Nigeria, or Sudan. These centers were proposed in the EU Summit in June of 2018. To incentivize the construction of the centers, a deal much like the one the EU currently has with Turkey would be proposed. In this deal, Turkey is offered

¹¹ To the bill *Projet de loi pour une immigration maîtrisée et un droit d'asile effectif*

more aid, a sped-up process of their accession into the EU, and visa free travel for its citizens.

Other condemnations for the protection of human rights include those from the European Court of Human Rights. The European Court focuses in particular on the detention of minors in Case A.B. and Others v. France (n° 11593/12). This case concerned the administrative detention of a child, then aged four, for eighteen days, in the context of a deportation procedure against his parents, Armenian nationals. The proposed French law has also been condemned by NGOs, such as Amnesty International. This is, once again, relatable to Trump, since detention of minors is very topical in the United States.

Perception

The proposed law project and the Migration Summit were highly influenced by perceptions. These perceptions are fed by the media through words, headlines, or pictures. Simply Googling the word “migrant” brings up a certain image. We see masses of people, lines without end, chaos, fire, and mostly people from one demographic. *Fig 1*. This is what we see in the news, too. Words like *jungle* for the Jungle of Calais, one of the biggest migrant camps that formed in France-brings an image of wild chaos.



Figure 1

An image of the Part Dieu migrant camp in Lyon, shows an apparent need for police to be there to control this chaos.

Figure 2. There is trash everywhere in this picture, which is a result of the “chaos” migrants bring.



Figure 2

Headlines can be dangerous in feeding perceptions. Many of us are guilty of just reading the headline, and never reading the entire article. We misconstrue information when this happens. Take, for example, the following headlines: Evacuation of young migrants installed in an esplanade of Part Dieu in Lyon¹², Illegal camp in Part Dieu: 149 evacuated¹³, Part Dieu station, the “plateforme of Africans” and their kids from

¹² Evacuation des jeunes migrants installés sur une esplanade de Lyon Part-Dieu (Henry)

¹³ Camp Illégal a la Part-Dieu : 149 personnes évacuées (Le Progrès)

the streets¹⁴. The first and second headlines were published a couple days apart, November 11, 2017 and November 9, 2017 correspondingly. Although the headline calling the number of evacuated was published earlier in October, all the headlines refer specifically to dissolving the camp in Part Dieu, Lyon and the flux of migrants. One headline mentions “Africans.” However, only one article tells us that the majority of the people from the camp were actually Albanians. The media helps misinform and these misconstrued perceptions have an impact on the policy, all while ignoring the importance of reality.

Reality

The way media portrayed the “migrant crisis” in France does not match the data found. Our study will focus on three areas: actual numbers of asylum seekers, ethnic origin, and the cost of the migration crisis.

France only accepts twenty-nine percent of the asylum-seeking applications, compared to Germany or Italy, that take upwards of fifty percent (Le Parisien)

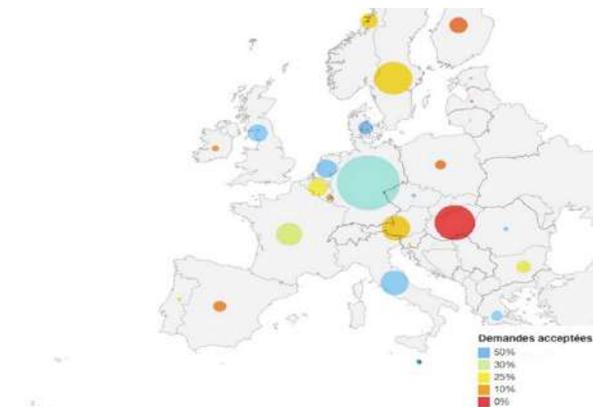


Figure 3

To better see the difference in those accepted from those who sought refuge we have *Figure 4*. Here we see how in 2015, over sixty thousand applications were submitted, but only less than twenty thousand were accepted by France (Le Parisien).



Figure 4

Race also plays a role in creating the perception that France is unable to control the flow of migrants. In all the images we have seen, the majority of the people in them were black migrants, or people with head covers, which triggers a division in foreignness in French society. According to a 2017 INSEE study, EU country citizens, specifically from Portugal, are still migrating to France, both of these are in the top five of those who arrive to France. *Figure 5*.

¹⁴ Gare Part-Dieu, la “plate-forme des Africains » et ses enfants de la rue (AFP)

Quelles sont les nationalités des étrangers vivant en France ?

Selon l'INSEE, 530 557 Portugais vivent en France.

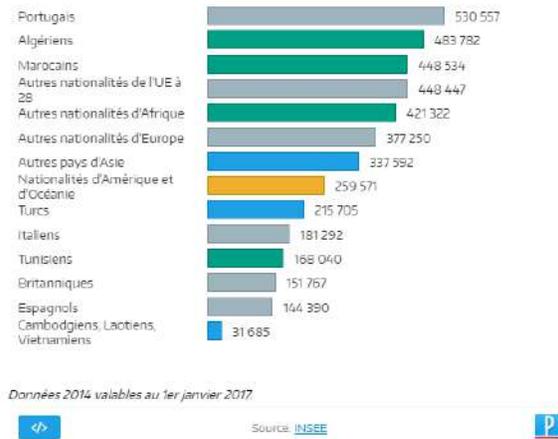


Figure 5

A closer look at the image shows us that of the top five, two more of those are old French colonies, such as Morocco and Algeria.

Although Albanians rank fourth as the largest groups seeking asylum in France in 2016, OFPRA said that counting minors, they had the highest numbers. Figure 6.

Principaux pays d'origine des demandes d'asile

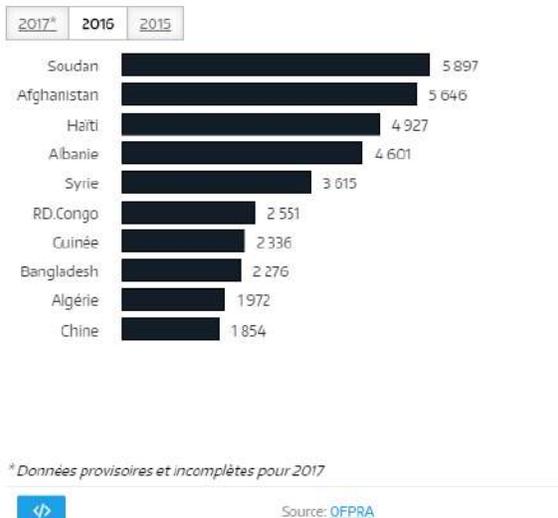


Figure 3

In a 2017 OFPRA study, Albanians were also the group with the highest numbers, excluding minors. Fig 7. In short, we see the true migrant profile is very different from what the media shows.

Principaux pays d'origine des demandes d'asile

Principaux pays d'origine des demandes d'asile

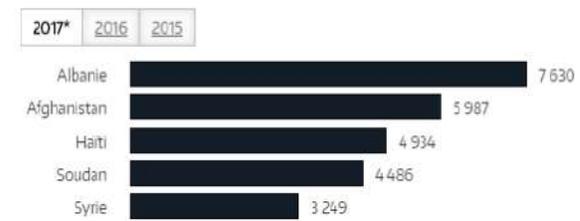


Figure 4

A harsh reality is that the weekend of the Migration Summit, where Italy said they were no longer accepting boats of migrants, Missing Migrant Project saw a spike in deaths of those crossing the Mediterranean. Numbers rose from 972 to 1405. The French also need to realize that the number of arrivals is also decreasing; 2015 was the peak year of arrivals. Many of these perceptions come from people just now feeling any possible effects that the peak waves caused. French citizens are also more aware of the migrant situation. These problems include migrant camp dissolutions, which displaces migrants, which causes discomfort in some to see the reality of migrants in irregular situations. From 2014 to 2017 all the asylum seekers will only cause a 0.3% (OECD) increase in the European working age population by 2020, therefore the impacts from the so called migrant crisis is not as problematic as it is deemed to be

Conclusion

False perceptions can be very dangerous. Sixty-one percent of French people thought there are too many migrants in France, even if some of these people have ancestry in a country outside of France (AFP). These types of sentiments will cause a rise in ethnic tensions, xenophobia, and islamophobia. This combined with another wave of the rising far right could be regressive. BMI Country risk report warns that the far right is gaining inroads in France, and that France is seeing more populist waves, such as the one currently hitting Italy it warns against another far-right politician such as Marine Le Pen.

In France for example, the far-right leader Marine Le Pen, known for her heavy anti-immigration stance, has many followers. But the migration crisis has extended to other political parties, as we have seen in the recent Collomb proposal. To keep the far-right followers happy, politicians like Macron and Collomb create laws that appeal to their ideologies.

It should be noted that migrants can cost the state up to 2.1 billion Euros a year (Cornudet). However, this too is misleading.

The money does not go directly into the pockets of asylum seekers. Rather, companies who build migrant camps or host migrants are the ones who profit. La Cascina, a company in Italy, was quoted saying that “migrants are more profitable than drug trafficking¹⁵.” If the migrant crisis costs so much, and if migrants are not the ones who profit, some wonder why not expulse more, which is also in the proposed law project. Expulsions, or deportations, are expensive. According to the French museum of history of immigration, they can cost from 12,000 to 27,000 euros per person.

In this I have shown how the so-called “migrant crisis” is not so much a question of migrants and asylum seekers specifically, as it is often portrayed: that is, a question of Syrians or Africans making their way to Europe. It is more of a humanitarian crisis, where often politicians and the media forget that migrants are humans too, and as such deserve to be treated with respect and dignity.

¹⁵ Envoyé Special : Qui veut gagner des migrants

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GAYTWITTER: AN INVESTIGATION OF BIASES TOWARD QUEER USERS IN AI AND NATURAL LANGUAGE PROCESSING

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Abstract

Natural Language Processing (NLP) has gained attraction for its universal applications and importance in decision making in AI technology. Research has revealed that Google's NLP API holds biases toward certain words; for example, it deciphers "homosexual" as holding a negative sentiment. This investigation focuses on applying NLP strategies to the queer virtual community, colloquially known as GayTwitter, to further investigate biases. Tweets from users of GayTwitter were comprised into a dataset to build, train, and test a sentiment analyzer. This sentiment analyzer employs Word2Vec, a NLP/AI technology, in conjunction with t-SNE technology which produce word embeddings of the tweets in the corpus. From this point alone, creating a unique dataset with hopes of reducing the bias found within NLP models showed a promising trajectory for formulating a method of mitigating biased AI technology.

Keywords: AI, Natural Language Processing, Word2Vec, t-SNE, Google, GayTwitter, Twitter

Introduction

As technology continues to progress, artificial intelligence (AI) and its many compartments persevere in filling the role of many traditional techniques. In its many components, NLP is quintessential for AI to operate efficiently, accurately, and ethically to provide proper and effective service. However, current NLP models contain biases against individuals of certain racial groups, sexual identities, and genders which inherently affects them negatively in one way or another¹⁶ (Caliskan-Islam, Bryson, & Narayanan, 2016). These biases come from the programmers who have engineered these models, despite the fact that the following appears in the ACM Code of Ethics and Professional Conduct in Principle 1.4: "Be fair and take action not to discriminate" ("Code of Ethics," 2016). Although associations or guidelines that aim to

prevent unethical biases to be programmed, engineers and recent innovations have continued implementing these biased models into greater and larger products, such as AI.

Considering that AI is around us everywhere now, NLP and the Internet of Things have taken meta-data collection to a new level. Natural language processing is an area of computing that is still in research; however, its purpose is to understand and manipulate natural text to create clearer understandings in computing systems. The issue behind this investigation involves the bias toward queer users and their sexual orientation being analyzed in a negative manner, primarily due to other AI technologies, but considerably NLP, too (Wang, Kosinski, 2017; Thompson, 2017). Without considering what further research of improving mechanics of NLP models, the societal impacts of biased NLP are also a

¹⁶ Google against queers, machine learning on prison bias, and gender bias articles

field of research that needs attention; considering that NLP models can further analyze structures of sentences, books, or “tokens,” this makes these models the perfect tool for constant monitoring and investigating into inequalities, biased incidents. In my final analysis of NLP, its influence once combined with AI, and its prospective direction in further years to come, I propose the following research hypothesis: Since bias toward minority populations exists in models which inherently influence AI technology to take harmful or negative action, what biases are instilled toward the queer community, and what solutions are there to fix them?

Literature Review

With the help of my mentor’s work on NLP models, Andrew Thompson’s article on Motherboard guided the initial direction of our investigation, as it posed further intriguing questions to what exactly these biased NLP models looked like. Thompson’s findings allude to bias that has made its way into AI, and provides examples of Google’s Cloud Natural Language API doing exactly just that; utilizing the sentiment analyzer component of the API, Thompson reveals that “jew” and “homosexual” carry a negative sentiment value of about -0.2 and -0.5 respectively on a scale from -1 to 1 (Thompson, 2017). However, these results do not only affect religious groups or attacks one for their sexual identity, researchers all over have found multiple NLP models and artificial intelligence models to hold a bias in one sense or another toward gender and race as well. To exemplify the power of bias in artificial intelligence, (Angwin et al. 2016) investigated biased prison systems which utilized face-recognition AI to denote black defendants as more likely to be at “risk” of recommitting a crime than their white counterparts (2016). While this issue

deals with image processing more so than NLP, a similar study which utilized enhanced image-processing technology managed to classify one’s sexual orientation from a single image at an 83% success rate (Wang, Kosinski, 2017).

In combined efforts to find a solution on how to mitigate these biases, AI researchers and legal teams have together observed that these models train and “learn” how to come become intelligent, the data in which they learn from is whatever is easiest to attain; furthermore, reinforcing that no matter how diverse creators are, or how perfect any algorithm may be, feeding in biased data will nonetheless produce biased results (Levendowski, 2018). Levendowski, a practicing lawyer, suggests copyright laws as a reason programmers and innovators are halted in bias mitigation strategies, referencing Google’s decision to not publicly release the Google News corpus (2018). Without possibilities of gaining access to proper training data, it remains in question whether de-biasing NLP models is a possibility given that proper data needed for training is secured or costly to acquire, leaving algorithms behind existing AI/NLP models to operate under discrete and evidently biased measures.

Methods

Working on formulating an approach on how to strategically examine these biases in NLP models, I knew that I wanted to gather and build a corpus utilizing Twitter data: more specifically, *Gay Twitter* data. *Gay Twitter*, a colloquially known sub-community of Twitter, involves queer identifying individuals that share the space online to discuss their culture, struggles, identities, and the freedom to speak in their own vernacular. While various NLP technologies exist, and are easily accessible to the public, we chose to implement a

Word2Vec model in this investigation for its efficiency as a word embedding processor, creating vectors from “tokens” gathered from the corpora it is trained on (Caliskan-Islam, Bryson, & Narayanan, 2016).

For the sake of not gathering or utilizing large corpora which have been used in previous studies, a collection of tweets were gathered using a Python library called tweepy¹⁷ granting access to Twitter API and the tweets of users a part of Gay Twitter. This way, we are testing unique, relevant, and fresh data. After compiling these into a CSV (comma separated value) file, it is crucial to ensure that all tweets pulled from Twitter API be in one encoding (i.e UTF-8). Next, this CSV file can be used in a NLP model: for this investigation, the Word2Vec model was utilized for training and testing the word embeddings. Lastly, an adaptation of Ahmed Besbes’ Twitter Sentiment Analyzer (2017) was used to determine the accuracy of our model; Besbes’ model implements use of the Word2Vec model, along with Keras, a high-level neural network API that runs on top of TensorFlow will be training our sentiment analyzer. After building the NLP model and training it on Besbes’ provided corpus of 1,600,000 labeled tweets, and testing on tweets pulled from Gay Twitter associates, an analysis of most similar tokens and accuracy of the sentiment analyzer can be drawn.

For visualization purposes, Appendix A and Appendix B show visuals as to how the word vectors become reduced down into a two-dimensional plane by implementing a t-SNE (t-Distributed Stochastic Neighbor Embedding) technique (Van der Maaten, 2018). This prize-winning technology is applied to large, real-world datasets, hence

¹⁷ <http://www.tweepy.org/>

why this strategy has proved itself to be efficient and simple in its presentation.

Results

Running through Besbes’ adaptation of his Sentiment Analyzer, observing trends in selected “tokens” and the accuracy of the overall model, we were met with some alarming results. To no surprise, biases toward specific tokens used as slurs against the queer community (i.e gay, fag, and lesbian) showed similarity in context to societally-negatively viewed terms:

Most Similar: Besbes' Model						
gay	'dumb' 0.664	'lame' 0.654	'retarded' 0.604	'creepy' 0.596	'rude' 0.587	'silly' 0.560
fag	'douchebag' 0.625	N/A	N/A	N/A	N/A	N/A
lesbian	'slut' 0.659	'musician' 0.625	'retard' 0.621	'gentleman' 0.619	'douchebag' 0.618	'stalker' 0.6

Figure 1. Word similarities, in context, to other tokens in Besbes’ corpora.

As shown in Figure 1, the results of the NLP embedding relays informative insight into what exactly these models are synthesizing behind the scenes whenever tokens are fed through it; overall, Besbes’ NLP Sentiment Analyzer scored 85% accuracy.

Onto our own model - the *Gay Twitter* NLP model - running the exact same tests as our first trial.

Most Similar: Gay Twitter Model						
gay	'straight' 0.876	'white' 0.825	'person' 0.723	'racist' 0.716	'lesbian' 0.711	'queer' 0.71
queer	'black' 0.92	'young' 0.898	'trans' 0.891	'Black' 0.862	'brown' 0.853	'women' 0.834
trans	'Black' 0.931	'queer' 0.891	'young' 0.889	'women' 0.878	'color' 0.853	'Latinx' 0.822

Figure 2. Word similarities, in context, to other tokens in our Gay Twitter corpora.

As shown in Figure 2, different tokens came back with much more promising results, inclusive results in respects to the queer community, thus providing greater insight into what the mechanics of the Word2Vec model does under the hood. Unfortunately, an inconclusive accuracy percentage of the

sentiment analyzer was not determined in this trial due to complications in readability and processing of tweets.

Discussion

In reflection of my methods, there were occurrences of human error, limitations in my access to data, and challenges in understanding the models I was working with. While we made an adaptation of Besbes' Sentiment Analyzer for tweets, we came across the error in translations and encodings of the tweets in the corpora; similarly, in the second trial, ensuring all tweets pulled from Gay Twitter were all in UTF-8 encoding consumed more time than anticipated. Having access to Standard Twitter API through the Tweepy library for Python granted us limited access to Gay Twitter user's tweets, capping off at the latest 3240 tweets from the user. Thus, in comparison to Besbes' corpus of 1.6 million labeled tweets, my corpus was insignificant in size, alluding to the skewed values of similarity in tokens. However, the results from Figure 2 equated the token 'gay' being closest to 'straight,' showing the word embedding strategies making connections between two sexual orientations, different than what we observed in the first trial. Lastly, failing to come up with an accuracy score of the Sentiment Analyzer for our second trial leaves out a significant piece to this investigation; given time constraints, the time it would have taken to fix those errors would have required a few more days of work.

Despite the fall backs, this investigation did produce beneficial results and advanced our understanding of what influences a unique and corpora can have on our Word2Vec model once trained and processed.

Considering the limitations, these results can still conclude a trajectory path for what is to be expected in years to come for AI and what improvements can be made. Further investigations into the realm of robotics AI and NLP seem to be on the come up, for recent innovations such as Sophia by Hanson Robotics and Erica the prospective news anchor in Japan will soon be blazing the path of where AI is heading today. Making sure to reduce or eliminate bias entirely in as many NLP models will be crucial for these new artificial intelligent species, as they will be interacting with members of society not only in person, but through data available through the world wide web.

Conclusion

In a final analysis of our investigation, it has been concluded that NLP models hold a bias in sentimental values for certain tokens, thus affecting AI to discriminate against those individuals. In this investigation, we were specifically focused on Gay Twitter, a queer community which resides online at Twitter.com. When considering that secondary data online is readily accessible and available to most users, it leads to greater inquiries as to what AI may use, or even abuse, with this type of data. As AI is composed of many other technologies other than NLP, this one field of research cannot lose its momentum, just as it is important for other sub compartments of AI to not lose their momentum either. In the context of this project, finding better methods to clean up and format tweets for readability, creating a larger corpus, and working on a machine of quicker computing capabilities can really push forward the results to show further inquiries, biases, or observable trends when working with diverse and unique datasets.

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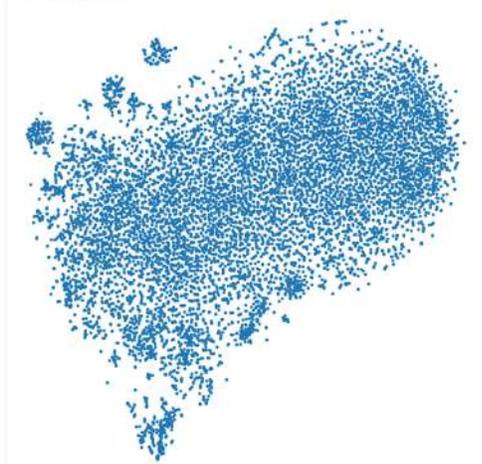
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Appendix A Besbes' Word Vectors Reduced to a Two-Dimension Plane

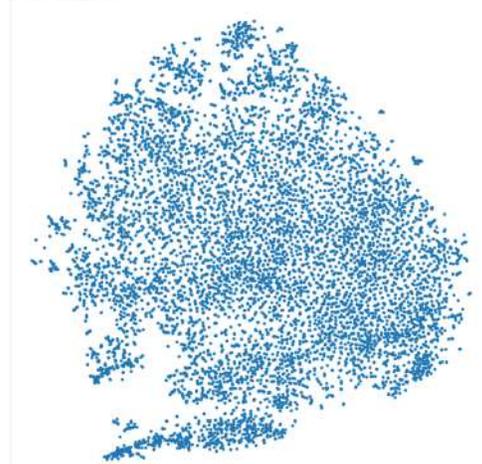
A map of 11000 word vectors



Appendix A shows what *Word2Vec* paired with *t-SNE* technology can do conjointly in visually representing words or “tokens” found in the large corpus. The points plotted on the map indicate similar surrounding words which are of the same context. In this sampling, an average of $n = 11,000$ words were plotted every computation.

Appendix B *GayTwitter's* Word Vectors Reduced to a Two-Dimension Plane

A map of 8050 word vectors



Appendix B shows what *Word2Vec* paired with *t-SNE* technology can do conjointly in visually representing words or “tokens” found in the corpus. The points plotted on the map indicate similar surrounding words which are of the same context. In this sampling, an average of $n = 8,050$ words were plotted for every computation. Despite this corpus having a smaller sample size, the distribution and concentration varies in comparison to Besbes' corpus, alluding to continual investigations and work.

THE EFFECTS OF CAFFEINE AND TAURINE ON NEURON MORPHOLOGY

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Abstract

Caffeine and taurine are common ingredients listed on the nutritional label of energy drinks. However, in many drinks, these compounds are marketed as a “specialized blends.” The consumption of energy drinks has increased in recent years, yet there is little research on neural morphology and the dosages of ingredients in these “specialized blends.” The present study investigated the relationship of varying dosages of caffeine and taurine on primary rat cortical neurons by measuring the neuronal outgrowth of primary, secondary, and tertiary neurites within each treatment and concentration condition. This evaluation included seven treatments (excluding the control group) of both caffeine (100 μ M -1mM) and taurine (50 μ M -2mM), cultured over two weeks. Neurons were imaged using phase-contrast microscopy and analyzed using NeuronJ. A One-way ANOVA and Factorial ANOVA were employed. Data collected was used to establish a dose-response curve for each agent. Caffeine displayed a biphasic curve inferring two mechanisms working on neurite regulation and taurine displayed a U-shaped curve. An interaction between neurite type and concentration on neurite outgrowth was apparent [$F(12, 5901) = 3.34, p = .005, \eta^2 = .007$], suggesting concentration impacts the frequency of the types of neurons, which ultimately contributes to overall neuron length. Furthermore, the main effects for treatment ($p < 0.001$), concentration ($p < 0.001$), and neurite type ($p < 0.001$) on neurite outgrowth were revealed and will be discussed.

Keywords: caffeine, taurine, dose-response curve, neurite outgrowth

Introduction

The market for energy drinks is predicted to grow by 61 million by 2021 (Research and Markets, 2015). They are used ubiquitously in college and found in most vending machines on campus. In addition to their convenience, they are a popular tool to increase efficiency in completing day to day tasks. A typical energy drink usually contains 1g of taurine and 80 mg of caffeine, other drinks offer "specialized blends," in which the exact amount of ingredient is not disclosed. In adolescent brains, consuming high doses of caffeine induces indisposed effects; including indigestion (Curran & Marczynski, 2017) and influencing neuronal outgrowth (Connolly & Kingsbury, 2010).

Neuron morphology is important because it provides insight into neural functions,

connectivity, and integration as well as development. Previous studies investigated the effects of caffeine (Connolly & Kingsbury, 2010; Fazeli et al., 2017; Juárez-Méndez, et al., 2006) and taurine (Li et al., 2016; Wu & Prentice, 2010) independently; however, few studies have investigated caffeine and taurine in conjunction with one another (Santha et al., 2013; Schaffer et al., 2014) and even fewer studies establish a dose-response for caffeine or taurine in rat cortical neurons. Thus, we intend to establish a dose-response curve for neurite growth after exposure to caffeine and taurine

and to predict how they affect neuronal outgrowth.

In the current literature, there are conflicting reports of taurine and caffeine effects, though it should be considered that none of the studies were replicates and each varies in methods and materials. The studies presented vary in the type of neuron (i.e. cortical rat neurons, neuroepithelial stem cells, age) and experimental methodology (i.e. immunohistochemistry, western-blot, PCR). Nonetheless, this acknowledges the need to conduct more studies to corroborate evidence of the neuronal morphology effects of caffeine and taurine.

Dose-response curve

Many agents have shown to enhance and regulate neurite outgrowth such as melanocortin's based on dose-response curves (Calabrese, 2008). Response curves are used to quantify the concentration of a chemical against its output, and useful to determine optimal ranges to manipulate concentrations to produce the desired effect. One major limitation in morphology literature is the lack of dose-response data (Curran & Marczyński, 2017). There are dose-response curves related to caffeine (Del Coso et al., 2012), but not in the context of rat neurons; the state of scientific understanding is the same for taurine (Nuseti, et al., 2005). In contrast to independent studies, an integrated investigation was completed and demonstrated a synergistic effect between caffeine and taurine across dose-response curves, but in the context of reduced platelet aggregates and hemostatic functioning (Santha et al., 2013). We anticipate the same will be portrayed in neurites; however, a foundation must be made to answer this overarching question by establishing both curves.

Caffeine and neuronal outgrowth

Caffeine, or *1,3,7-Trimethylpurine-2,6-dione*, has multiple neuroactive roles, including antagonism of adenosine receptors via blockade of A1 and A2A receptors and regulation of dopaminergic release. In addition, caffeine has been found to regulate neurite growth in response to concentrations less than 10 μM that stimulate neural CREB gene expression. In turn, activating expression of *BDNF* and IEGs, which promote neuron survival outgrowth and synaptic plasticity *in vitro* (Connolly & Kingsbury, 2010) and this mechanism suspected to explain why caffeine treatment groups (50 mg/kg) displayed longer dendrites *in vivo* than the control with no caffeine (Juárez-Méndez, et al., 2006). Concentrations of caffeine of 40 mM show decreased outgrowth, caused by Ca^{2+} dependent cone deterioration in neurons, though it should be noted this finding was collected from a neuroepithelial stem cell culture (Bandtlow, et al., 1993). The most recent study suggests medium doses of caffeine enhance outgrowth, while high $>100 \mu\text{M}$ or low dosages $<10 \mu\text{M}$ suppress outgrowth; more broadly, the cell's response to stimulus is dependent on the concentration, elapsed time of exposure (Yu et al., 2017), and age of neuron *in vitro* or *in vivo* the treatment is administered (Tchekalarova et al., 2014). In addition, caffeine was found to antagonize GABAA receptors which may increase physiological activity that could perhaps increase neurite outgrowth (Lopez, et al, 1989), by influencing the neurons to fire and wire together.

Taurine and neuronal outgrowth

Taurine, or *2-aminoethanesulfonic acid*, is a conditionally essential amino acid serving many functions in the central nervous system including acting as a

neurotransmitter, regulating calcium homeostasis, and neuroprotective activity (Wu & Prentice, 2010). Excess taurine is excreted from the kidney's, but the most taurine comes from meat and fish. A deficiency in taurine may lead to developmental abnormalities and severe eye impairments. Taurine is copious in the brain and structurally similar to GABA, or *4-aminobutanoic acid*, a neurotransmitter responsible for inhibiting action potentials by allowing Cl⁻ to leak from the inner membrane, and has been widely accepted since the 1960's. Taurine specifically binds to GABA receptors inhibiting the binding of GABA and showing hyperpolarizing effects but fails to affect GABA sensitivity and ultimately does not mediate response (Olmo, et al, 2000).

The effects of taurine concentration on neuronal outgrowth consistently demonstrate increased dendrite length in lower concentrations moderately promote neurite length (100 μ M) while high concentrations (2.7 mM) will decrease neurite length and number (Shivaraj et al., 2012; Nusetti, et al., 2005). A dose-response curve was not found for taurine in the context of neurite length, but showed a sigmoidal curve for taurine and was just above baseline; the EC₅₀ was 1.5mM (Schmieden, et al, 1992). The ranges of doses tested in the literature helped inform the exact range of doses that should be tested in this experiment.

Methods

Gibco Cell Culture Cryopreserved Rat Cortical Neurons were obtained from Thermo Fischer Scientific (Cat. No. A1084001) and cultured in 7mL Falcon™ Standard Tissue Culture Dishes (Fisher Scientific; Cat. No. 353002) with poly-D-lysine (Sigma-Aldrich; Cat. No. P6407), laminin (ThermoFisher Scientific; Cat. No.

23017015), and phosphate-buffered saline (ThermoFisher Scientific; Cat. No. 10010023) for 20-40 minutes and left in the freezer for two days. Cells were cultured with 2ml of control medium. Four hours later the medium was changed to pull off any DMSO's. The cells were fed at 37° C with a medium containing 4% Fetal Bovine Serum (ThermoFisher Scientific; Cat. No. 10438018), Pen-strep (ThermoFisher Scientific; Cat. No. 15140122), B-27 (ThermoFisher Scientific; Cat. No. 17504044), Glutamax or L-glutamine (ThermoFisher Scientific; Cat. No. 25030081), and Neurobasal (ThermoFisher Scientific; Cat. No. 21103049) every four days for 2 weeks. Agents were not introduced until after two or three regular feedings with their respective working solutions depending on treatment. For a detailed explanation of Method, see reference (Pemberton, K., et al, 2018).

Trial one includes caffeine treatment: cells were suspended with a density of 191 cells/mL/mm² per culture dish. Working solutions were made to create the mediums containing caffeine concentrations of 5 μ M, 10 μ M, 25 μ M, 50 μ M, 100 μ M, 500 μ M, 1000 μ M. Caffeine (Sigma Aldrich; Cat. No. C0750) treatment was not introduced until feeding 3. Trial two includes taurine treatment: Cells were suspended with a density of 234.8 cells/mL/mm². Working solutions were made to create taurine concentrations of 50 μ M, 100 μ M, 250 μ M, 500 μ M, 750 μ M, 1 mM, 1.5mM, and 2mM. Taurine (Sigma Aldrich; Cat. No. T0625) treatment was introduced after feeding 2.

Neurons grown were fixed with Paraformaldehyde and rinsed twice with Phosphate Buffer Solution and then mounted with Mounting Medium (Sigma Aldrich; Cat. No. C9368). Fixed cells were imaged using phase contrast under a Leica

microscope and analyzed by *ImageJ*, using the Fiji image package *NeuronJ*. Ten photos from each concentration were calculated. Two ANOVA tests will be conducted, a one-way and a factorial, as well as a dose-response curve for each treatment. The statistics will be computed in *SPSS* to reveal any significant differences in morphology Figures 1 and 2 and *Prism* for Figure 3.

Results

One-Way ANOVA was conducted to test the relationship between concentrations and the control group on neurite length. The treatment concentrations range from 5 μM to 1 mM for caffeine, and 50 μM to 2mM for taurine with a total of 7 conditions for each treatment excluding the control. Caffeine revealed a significant difference in neurite length between the control and the various concentrations [$F(7, 3378) = 39.54$, $p < 0.001$]. Taurine revealed there was a significant difference in neurite length between the control and the various concentrations [$F(7, 3206) = 6.424$, $p < 0.001$]. Levene's test indicated homogeneity for both treatments ($p < 0.001$), so post hoc test Tukey HSD was employed. In caffeine, Tukey (Table 3) showed an increase in neurite length in all concentrations in comparison with the control ($p < 0.001$), except in 25 ($p = 0.960$). In taurine, Tukey (Table 4) showed an increase in neurite length for half of the taurine concentrations (50 μM , 100 μM , 500 μM , 2mM) with respect to the control, and the other half showed no difference in neurite length (750 μM , 1 mM, and 1.5 mM). The means and standard deviations for the various caffeine and taurine concentrations, and the F values in Table 1 and Table 2 respectively. Tables for One-way ANOVA for caffeine and taurine not shown.

Table 1
Caffeine: Descriptive Table with F-value

[Caffeine] μM	M	SD	F
			39.54*
0	47.67	31.74	
5	75.91	50.43	
10	60.61	41.52	
25	50.69	40.23	
50	79.37	60.07	
100	89.60	59.58	
500	80.43	81.70	
1000	74.58	53.67	

Note: * Indicates a significance level of $p < 0.001$; [] indicate the concentration of treatment; M= Mean Length in μm ; SD= Standard Deviation; F= F-value

Table 2
Taurine: Descriptive Table with F-value

[Taurine] μM	Mean Length	SD	F
			6.424* .000
0	47.67	31.74	
50	61.34	42.69	
100	59.55	44.44	
500	56.30	47.58	
750	50.87	40.10	
1000	50.72	38.14	
1500	55.95	45.08	
2000	56.31	34.91	

Note: * Indicates a significance level of $p < 0.001$; [] indicate the concentration of treatment; M= Mean Length in μm ; SD= Standard Deviation; F= F-value

Table 3
Tukey HSD on Dependent Variable: Caffeine's Neurite Length (μm)

CONTROL	[Caffeine] μM	Mean		
		Difference	Std. Error	Sig. (P)
0.00	5.00	-28.24*	3.08	.000
	10.00	-12.94*	2.85	.000
	25.00	-3.02	2.78	.960
	50.00	-31.70*	4.03	.000
	100.00	-41.93*	3.67	.000
	500.00	-32.76	3.56	.000
	1000.00	-26.91*	3.20	.000

Note: * Indicates the mean difference is significant at the 0.05 level compared to the control. All values rounded to two decimal places except for the Sig. (P).

Table 4
Tukey HSD on Dependent Variable: Taurine's Length (um)

CONTROL	[Taurine] μM	Mean		
		Difference	Std. Error	Sig. (P)
0.00	50.00	-13.68*	2.51	.000
	100.00	-11.83*	2.66	.000
	500.00	-8.63*	2.56	.017
	750.00	-3.12	2.50	.917
	1000.00	-3.16	2.54	.918
	1500.00	-8.28	3.04	.114
	2000.00	-8.64*	2.74	.035

Note: * Indicates the mean difference is significant at the 0.05 level compared to the control. All numbers were rounded to two decimal places except Sig. (P).

A Factorial ANOVA was conducted to evaluate the effects of treatment condition caffeine and taurine, seven concentrations of each treatment plus a control, and the type of neurites (primary, secondary, or tertiary) on neurite length. The ANOVA indicated a main effect for treatment [$F(1, 5901) = 205.27, p < 0.001, \eta^2 = .034$], concentration [$F(9, 5901) = 3.670, p < 0.001, \eta^2 = .006$], and type [$F(2, 5901) = 22.70, p = .000, \eta^2 = .008$]. The treatments main effect signifies caffeine ($M=63.07, SE=3.06$) has the greatest neurite length increase than taurine ($M=55.86, SE=.93$) compared to the control ($M=43.10, SE=3.08$). Although, taurine still shows longer neurites than the control with a significance between all treatments $p < .001$. The concentrations' main effect on length is not consistent, so we will rely on the significant interaction to give us more insight. The types main effect shows primary neurites ($M=65.39, SE=.687$) are longer than secondary ($M=56.50, SE=2.02$) and tertiary ($M=52.69, SE=8.86$) neurites overall for both treatments. No other significance was found between the other types of neurites overall. Individually, however, taurine and caffeine only showed a significant difference between primary and secondary. Further, a significant interaction was found between concentration and neurite type [$F(12, 5901) = 3.34, p = .005, \eta^2 = .007$], on neurite length. Factorial ANOVA results shown in Table 5.

Table 5
Factorial ANOVA

Source	df	Mean Square	F	Sig. (P)	Partial Eta Squared
Concentration	9	7811.04	3.67	.000	.006
Treatment	1	436887.95	205.27	.000	.034
Neurite Type	2	48291.69	22.69	.000	.008
Concentration * Neurite Type	18	7114.22	3.34	.005	.007
Error	5901	2128.41			
Total	5931				
Corrected Total	5930				

Table 5: The table above shows significant main effects and an interaction. All values were rounded to two decimal places except Sig. (P), and Partial Eta Squared.

A dose-response curve was established for both treatment conditions caffeine and taurine using mean lengths with respect to the control including error bars representing standard error. The dose-response curve for caffeine is a biphasic curve, and taurine's curve displays a U-shaped curve. See Figures 1 and 2 respectively for curves. Non-significant results will not be displayed.

Figure 1

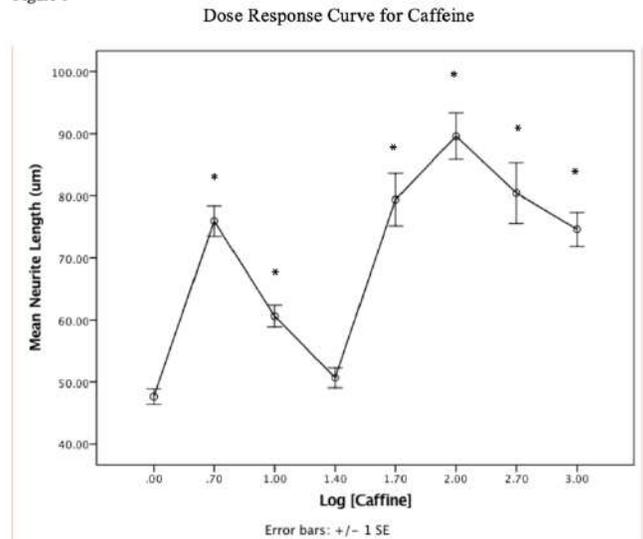


Figure 1: * Indicates a significance of $p < 0.001$. Mean Neurite Length (μm) is plotted against caffeine concentrations which have been transformed into logs. This shows every concentration is significantly longer than the control except for 25 μM . Standard errors are reported.

Figure 2

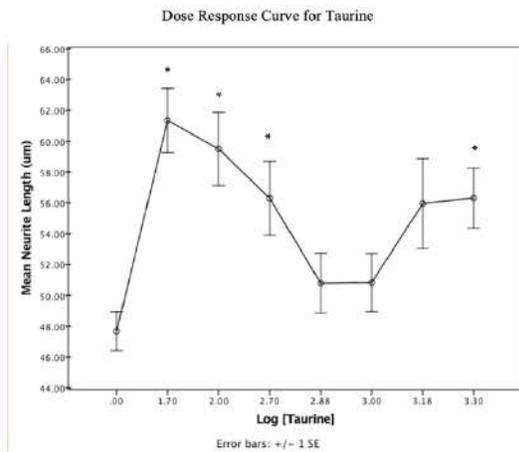


Figure 2: * Indicates a significance of $p < 0.001$. Mean Neurite Length (μm) is plotted against taurine concentrations which have been transformed into logs. This shows every concentration is significantly longer than the control except for 750 μM , 1000 μM , and 1500 μM . Standard errors are reported.

Discussion

The main effect for treatment shows an overall 43.6 percent increase compared to the control for caffeine and an overall 29.6 percent increase for taurine. However, this does not give us insight into what concentrations we should be testing while keeping in mind the overall goal of this paper to build the foundation for further research. The main effect of concentration showed no obvious pattern as to what the difference was between each combination of concentrations except that most of each treatment's concentrations were significantly different from one another. The main effect for type based on the statistics main contribution was due to the difference in length between the primary and secondary neurons. Lastly, the interaction between concentration and type on neurite length suggests concentration impacts the frequency of types of neurons, which ultimately contributes to overall neuron length.

The results show caffeine exhibits longer neurites than the control which corroborates existing literature on neurite morphology (Connolly & Kingsbury, 2010). The caffeine dose-response displayed a biphasic curve.

After another literature search, we found biphasic responses of caffeine present in other biological functions like heart rate and body temperature (Fredholm, et al, 2017), which may suggest multiple mechanisms affecting the response. Future studies may seek a timing dependent component with the inhibitory binding of caffeine with adenosine receptors, such as caffeine having different binding affinities for each adenosine A1, A2A and A3 receptor. Another possible mechanism to investigate is the density of adenosine receptors per neuron compared to each neurite length to give more insight into if the type of receptor is modulating the output response and how this is contributing the main effect of concentration.

Taurine's measured neurite length corroborates existing literature in the sense that they are not much longer compared to the control lengths. However, taurine's dose-response curve displays a U-shaped curve suggesting concentrations 750 μM , 1 mM, and 1.5 mM interfere with continued increased growth to baseline, and at those concentrations may suppress a growth regulator, or have a competitive binding mechanism for the GABAA receptor with GABA. Since GABAA receptors selectively allow Cl^- ions to pass when activated it may induce an electrophysiological change that influences how often the neurons fire and possibly even how far they will grow towards another neuron and increase the neurite length. In another respect, taurine did not corroborate existing literature at concentration 50 μM and may allude to the fact of some sort of systematical error or contamination. Mistakenly, taurine concentration 250 μM was lost due to mounting a slide upside down during fixation. In result, this curve and should be tested again. Future studies should aim to establish and confirm a larger range of

concentrations for the continued effort to establish reproducible responses in neurites. Further, a deeper analysis should be pursued including but not limited to tracking genes transcriptions like *BDNF*, staining with immunofluorescence, and/or performing a Sholl Assay to test other aspects of morphology more generally.

The main effects found for each variable show we picked good doses to try to establish a foundation to help answer questions about these agents coexisting within a culture and the significance level them and especially between the concentrations indicate we picked appropriate dosages to address gaps in the literature that accurately captures overall behavior. However, this study fails to account for individual neuron differences. Nonetheless, neurites treated with caffeine grew longer in comparison to the taurine, but which agents' behavior would dominate the response if they were used as a treatment together? What if we took the lowest lengths concentrations of the taurine curve and paired them with the peaks of caffeine? What about combining the lowest caffeine concentration length with the peak of taurine? There is little literature addressing

this question of combination; of both treatment and varying doses and examining common mechanisms such as serving as an agonist for the GABAA receptor. In retrospect, this experiment gives us a solid foundation to purposefully choose concentrations to produce meaningful tests in the future to examine formerly mentioned mechanisms. Figure 3 provides a transposed graph of both treatments to inform concentration combinations in future research.

Figure 3

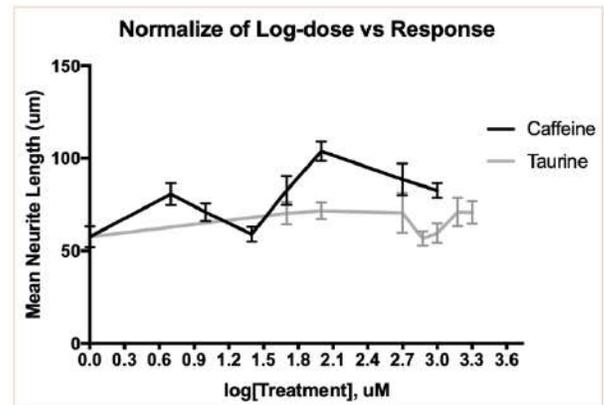


Figure 3: Displays log-dose for both treatments against mean neurite length (μm) and is a visual for future research to choose informed combinations of concentrations.

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“AMERICAN AS APPLE PIE”: REIMAGINING GANGS AS A REPRESENTATION OF AMERICAN IDEALS

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Abstract

Although gangs and the United States seem to act in opposition to one another, Americans who participate in gangs are still Americans; thus, they are susceptible to mirroring their reality in a way that still strives to achieve a distorted kind of American dream. This is because undergirding the American democratic project are the guiding ideals of family, the right to bear arms, and capitalism. Though seemingly counter to this project, gangs reify these same values. Using foundational texts on the formation of these American ideologies and scholarly sources on the impact of gangs within a society, I will argue that because gangs and America both embody the same foundational principles but employ them through different means, gang activity ought to be considered a re-articulation of American ideology. My goals are as follows: 1. Explore whether American foundational texts and gang manifestos embody the same foundational principles; 2. Illuminate the means by which both groups employ American ideology; and 3. Rearticulate the parallels between American ideology, political embodiment, and the dismissal of marginalized communities as part and parcel of the two.

Keywords: Gangs, America, Human Rights, Justice

Introduction

In the years prior to his death, my father was a family man who lived in a predominately white suburb of Saint Louis far from the city streets that raised him, but in the '90s, daddy was a thug. Back before the word was co-opted by mass media, it was a word that he wore like a badge of honor. At that time, rapper and activist Tupac Shakur's message about what thug life actually meant resonated with the light skin boy from the West Side. Tupac's "reimagining of a word that the Oxford Dictionary defines as 'a violent person, especially a criminal' into a positive attribute resonated. Tupac's vision redefined the word 'thug' into a man who triumphs over systemic and societal obstacles" (Reeves). For my father, that triumph came at a cost; he was further demonized by American society for not only

being a Black man, but being a Black man who dared to pledge allegiance not to his country, but to his brothers, fellow members of Saint Louis' Blood gang.

In 1969, during the height of the 20th century Black Power movement, Kwame Ture had a simple assertion about the role of Blackness within the U.S. According to Ture, "America does not belong to the Blacks" (Mwakikagile, 2007). From his perspective, Black people have never truly been granted citizenship into the nation wrought with anti-Black violence. Thus, to be American is to be white. Given that framework, whenever America is referenced in this text it will not be a descriptor of Blackness and other forms of non-whiteness within the United States; rather, it will embody the culture of whiteness within the aforementioned nation.

Because America never really belonged to Black people, some have relied upon collective efficacy to create a society that honors their humanity and makes room for mobility. This idea of collective efficacy, the ability of a community to solve its own social problems, offers insight into the formation of gangs and informs their structure in the modern day (Sampson).

Capitalism

That same foundation of collective efficacy is present in gang's reimagining of capitalism. Like America, capitalism has ostracized the Black community and historically treated the oppressed group like a commodity rather than merchant or investor. In Dr. Robin D. G. Kelley's *Freedom Dreams: The Black Radical Imagination*, he argues that capitalism and the ways that Black people experience both wealth and poverty in America are inextricably tied to slavery and racism (Kelley, 2002). Because capitalism so often fails young Black people, some choose to join gangs as a reimagining of capitalism that is not reliant on wealth or racialized nepotism-- that is the ways in which people grant preferential treatment to those not only within their biological family, but, more broadly, within their race (Kelley, 2002).

This is also evidenced in Alan Seals, PhD's study titled, "Are Gangs a Substitute for Legitimate Employment? Investigating the Impact of Labor Market Effects on Gang Affiliation," where he considers capitalism's ties to class, race and gang affiliation (Seals, 2009). He cites and extrapolates a study by Grogger that finds that, "poor youth labor market conditions may account for the hump-shaped relationship between crime and age" (Seals, 2009). He goes on to say that, "the high incidence of black criminal offenders may be a result of the Black/white earnings gap" (Seals, 2009). What this

means is that the reason why some young, Black people resort to criminal behavior in the face of poverty is not because of some innate need to behave badly, but actually comes as a result of low economic mobility. In the way that some wealthy, young people can depend on their parents or members of their communities to procure gainful employment for them, in poor Black communities where one could go miles without seeing an opening for a job, that option just is not as available.

In response to this system of inequality, some people who live within gang-laden communities have come to rely on a cultural capital as a means of deracializing and redefining capitalism within Black communities. Alan Seals considers this phenomena in his understanding of capitalism within gang structures (Seals, 2009). He bolsters his argument using Pierre Bourdieu's work on varying forms of capital and the conditions that breed them (Seals, 2009). "Bourdieu's concept of cultural capital refers to the collection of symbolic elements such as skills, tastes, posture, clothing, mannerisms, material belongings, credentials, etc. that one acquires through being part of a particular social class" (Seals, 2009). While gang members do deal in money, there is also a component of capitalism within gangs that cannot be so easily quantified. This cultural capital decides who gets to sit atop the neighborhood hierarchy. If a person has more cultural capital, colloquially referred to as swag and or swagger, then they, in a way, hold more value than someone who might lack the same level of esteem.

Conversely, capitalism has worked on behalf of Americans for hundreds of years. Adam Smith, the founding father of capitalism, had imagined a society where people worked and were paid according to their labor. He

said as much in his foundational text, *Wealth of Nations*. “The annual labour of every nation is the fund which originally supplies it with all the necessaries and conveniences of life which it annually consumes, and which consist always either in the immediate product of that labour, or in what is purchased with that produce from other nations” (Smith, 1776). Smith imagined a society where everyone who labored was paid for their work adequately so that no one would ever have to go without and each family’s household income would match if not exceed their needs (Smith, 1776). He wrote those words in 1776, a time when Black folks, whose bodies were owned by their enslavers, toiled over their master’s land day in and day out without compensation. Those barriers still exist today. Black people, on average, have lower earnings than white people; live in less affluent neighborhoods and have considerably less generational wealth to fall back on (Seals, 2009). Capitalism has always taken the side of America and left Black people to claim their own wealth by any means necessary.

Family Values

Another aspect of American culture that gangs have taken hold of is the value of family within communities. In America, family values are also given extreme importance, especially within the country’s political landscape. The Republican Party, in particular, prides itself on family values. According to the Grand ‘Ole Party’s (GOP, 2016) official website, “the family is the bedrock of our nation. When American families flourish, so too does our country. Our Party’s economic and social policies, including tax reform, education, healthcare, and the sanctity of life, should always promote and strengthen that most sacred bond” (Republican Platform, 2016). While some may vehemently disagree with the

ways that the GOP enacts policies surrounding what they call “family values,” there is little room for argument as to whether or not they prioritize it on their party’s platform.

In Scott Decker and Barrik Van Winkle’s book, *Life in the Gang: Family, Friends, and Violence*, they interview young men who are involved with gangs and asks them to speak to their perception of gangs as they relate to a familial structure. “Well we call it a gang I guess because we all stick together and stuff and if somebody disrespect us we just come and retaliate” (Decker and Van Winkle, 1996). In that participant’s perception, gangs, like families, must have a foundation of loyalty. It is also important to note that the many of the respondents were young folks, in their late teens and early twenties (Seals, Image One). While some people form their loyalties as a result of a biological connection, others create that bond based on shared experiences and similarities within culture (Decker and Van Winkle, 1996). Other young people may feel a similar loyalty to their sports team or student council club within their schools, but lack of adequate funding in urban schools have robbed many young Black students of that (legal) connection to each other and to a larger institution that has the resources to properly care for them (Decker and Van Winkle, 1996). Another person cited within the same text defines gangs as “a large number of people period. Most of the time you with a lot of people so you don’t have to worry about getting jumped” (Decker and Van Winkle, 1996). Here, the bond is built upon protection. Although there is no inherent violence within urban areas that does not exist in suburbia, there is a different kind of protection necessary for a person growing up in an area that might lack access to basic necessities, an efficient police force, or community members who

have the agency required to do the policing themselves.

This kind of community building in the midst of injustice is not new to Black Americans. Rather, reports of pseudo-familial structures within the Black community have existed for hundreds of years with some even existing antebellum Black lore. In Catherine Lee's book, *Fictive Kinship: Family Reunification and the Meaning of Race and Nation in American Immigration*, she views fictive kinship as the unifying force that has helped people of color stay afloat even as systems and institutions have routinely failed them (Lee, 2013). Given that understanding: gang's imagining of family, the implications of fictive kinship and America are all factors that cannot be divested from one another as they are all interdependent (Lee, 2013). Black people in America, more specifically Black people within gangs, have prospered for as long as they have because of the loyalty and protection that their co-created community provides for them.

Right to Bear Arms

The final value that exists both in American discourse and that of gang members is the right to bear arms. This right, as outlined in the Second Amendment to the United States Constitution, seemingly grants all American citizens the right to own guns as a means of protecting themselves. Unfortunately, Black people have been all but left out of this narrative, with their ownership of firearms being criminalized rather than accepted as one of their inalienable rights. The National Rifle Association, America's largest pro-gun lobbying group, has come under fire for their reluctance to include Black people in conversations about gun policies and ownership. This issue was brought into the spotlight in the wake of Philando Castile's murder. His story, as reported in the *New*

York Times claims that, "Mr. Castile was licensed to carry a gun and was recorded on a dashboard camera video calmly telling Officer Yanez that he had a weapon in the car. Officer Yanez told him not to reach for the weapon, and Mr. Castile and Ms. Reynolds both tried to assure the officer that he was not doing so. Within seconds, Officer Yanez fired seven shots" ("Minnesota Officer Acquitted", 2017). That case sparked national outrage as people slowly began to realize that Castile was the legal owner of the weapon that he carried, but the assumption was that he, although having been born within the United States, did not have the right to carry a firearm. That assumption is not unlike the one surrounding gun ownership within gangs. Historically, the image of an armed Black person has struck fear in the hearts of Americans. Thus, gang members have no choice but to acknowledge the way that America perceives guns when they're in Black hands. That does not stop gang members from arming themselves, though. The fact is, gang members arm themselves for many of the same reasons as white conservatives: as a means of protection against forces that threaten to wreak havoc upon their own lives or the lives of the people whom they hold closely.

Contrary Research

While many scholars argue on behalf of the notion that gangs employ a system of fictive kinship within their structure, there are others whose opinions stand in stark opposition. One such academic is Stanton E. Samenow, the author of "The Myth of Street Gang as a Family Substitute." As the title suggests, Samenow does not find any truth in the suggestion that gangs have a connection to family (Samenow, 2011). He goes on to insist that if young people just got more involved in schools and extracurricular clubs, there would be no need for gangs

(Samenow, 2011). He finishes with a comparison: people of other backgrounds (read: races) have experienced poverty just as much as poor Black people, but they do not choose to join gangs (Samenow, 2011). Much of his argument can be undone with the simple assertion that he is viewing gangs from a lens of anti-Black racism that causes him to dehumanize gang members as a way of reifying his own beliefs. Moreover, Stanton also ignores the role of underfunded and over policed school systems within many urban areas in the United States. Seals draws these associations in his text “Are Gangs a Substitute for Legitimate Employment? Investigating the Impact of Labor Market Effects on Gang Affiliation.” What Seals sees as Black people “making excuses” is actually rooted in culturally significant barriers that exist in poor, Black communities. Non-Black people do join gangs, but the circumstances affecting Black gang members is unique and ought to be honored with its own, dedicated research.

Discussion

Granting humanity to people whom society oftentimes dehumanizes is at the center of all of my research. As I began this topic, it was clear that there many texts about the role of gangs in society, but most of them were pathologizing rather than explanatory. I found, early on, that the academy has a sort of blind spot when it comes to the human experiences of criminalized people. I did not go about this paper trying to convince people that gangs were good or healthy for society, but rather to shine a light on a group of people who are so often cast aside and judged prematurely.

Limitations of These Studies

There were a few limitations in my study that may have informed the results. The limitations result from secrecy within gang

culture and lack of personal access to living gang members.

Secrecy. Loyalty is one of the primary pillars of gangs all over the world. From secret hand symbols to coded language, gangs rely on privacy in order to maintain their safety and to continue operations without interference from rivals or law enforcement. This limited the amount of access that I had to primary sources written by and for gang members. The first-hand accounts that I was fortunate enough to use were funneled through other academicians’ lens before they came to me.

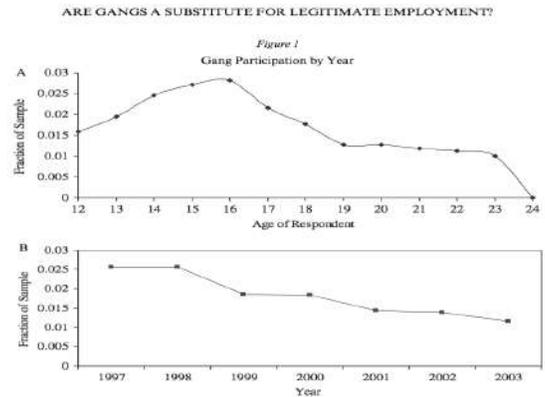
Lack of personal access. At the start of my research I figured that I could rely most heavily on the written word (books, manifestos, articles, etc), but as time went on I found that this project could have benefited from personal anecdotes from current gang members. That would have allowed me to ask questions of them that had been tailored to my research and given me the opportunity to build rapport with them. Moreover, this study lends itself to underground and possibly undercover exploration, but, understandably, that opportunity was not an option for me given the serious risks.

Conclusion

Black people have never been invited into the mythological American family. We, the bastards, in order to form a more perfect union have relied upon internal structures where we could relish in our Blackness without being suffocated by the confines of a country that has never truly taken us in. Gangs are one such structure that has existed for decades on the fringes of American society. Up until this point, much of the scholarship surrounding gang involvement has been pathologizing rather than seeking the cause of gang affiliation in the United

States. The fact is, gangs are not inherently alien to mainstream America; rather, they are uncomfortably familiar. Gang members within the United States, no matter their physical proximity to whiteness nor their dedication to the country; were acculturated into America; thus, the two, seemingly dichotomous institutions are, in fact, indivisible. With this, instead of being invited to the American table, Black people within gangs have made their own and this one, much like its predecessor, is invite-only.

Graphs



(Seals, Image One)

Table 1
Frequency of Criminal Behavior, Labor Force Participation, and School Enrollment
By Gang Affiliation

Percent	Currently in a Gang	Not Currently in a Gang
Sell Drugs?	39.54	7.01
Steal Property > \$50?	30.69	4.05
Attack Someone?	56.28	10.96
Carry A Gun?	45.43	8.95
Work?	33.16	46.07
Enrolled in School?	57.4	67.11

(Seals, Image Two)

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EFFECTS OF RACIAL AND ETHNIC BACKGROUND ON MATERNAL HEALTH IN THE U.S.

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Abstract

This research project aims to look both qualitatively and quantitatively at maternal care and maternal mortality in the American healthcare system, specifically examining the relationship between racial and ethnic background, quality of care, and fatalities. For the quantitative research, data regarding births, maternal deaths, and demographic information of the mothers was collected from individual states in America. The data was analyzed, using statistical software, to examine different relationships between race, ethnicity, and maternal death. For the qualitative research, information regarding social infrastructure that may contribute to poor maternal health, such as access to insurance and familial wealth, is also considered, and examines the differences between ethnic groups in regard to these social factors. The project will explore some ways in which demographics affect maternal health in America statistically, and examine some of the social and medical aspects that are likely to be contributing factors to maternal health disparities and the high rate of maternal mortality in the United States.

Qualitative Section

Introduction

In recent years, there has been renewed interest and cause for alarm regarding the American healthcare system, and in recent months in particular there has been concern over the low ranking of the United States in terms of maternal care, especially regarding maternal mortality. Maternal mortality is most commonly defined as the death of a woman while pregnant, during birth, or within the first 12 months after giving birth. Internationally, there has been an extensive history of difficulty in tracking maternal deaths, though death in childbirth has long been known to often be the leading cause of death for women of childbearing age. While death during childbirth has decreased considerably with the advent of modern medicine, there are still vast discrepancies between death rates in higher income countries versus lower income countries. Though it is these intercountry discrepancies that are often highlighted in studies, within

individual nations there also often exist very drastic discrepancies, specifically along ethnic and socioeconomic lines.

This past year, the United has come under fire, primarily from its own citizens, for the increase in maternal mortality, placing the U.S. far lower than most high-income nations, such as Canada and Norway. At the same time, narratives discussing the negative experiences of women of color have increased, including prominent figures, such as renowned athlete Serena Williams, who had a complication after the birth of her child that led to blood clots in her arteries that almost killed her. In the United States, the Center for Disease Control (CDC) has determined that black women are three times more likely to die from a complication with childbirth than white women.

Along with these issues in the healthcare system, there has also been a change in the

demographics of mothers in America. The change most commented on is the increasing age of mothers, both first time mothers as well as with later births. More and more women are putting off having children, often citing career advancement or financial stability as a factor. This means an increasing number of women are having children into their 30s or 40s, which often increases the risk of complications surrounding pregnancy. There has also been talk of how the opioid crisis is affecting young women and mothers, particularly in rural and predominantly white areas of the country. There is a fear that opioids are making pregnancy riskier, both for mother and child, and these deaths contribute to the rising numbers.

The trend that I am interested in, however, is the demographic shift that is sweeping across America. There has been much apprehension following the revelation of the fact that the demographics of the United States are predicted to radically shift in the upcoming decades. By approximately 2040-2050, or mid-century, white Americans will make up less than 50 percent of the population (Pew Research Center) and, if current growth rates continue, by the end of the 21st century Hispanic/Latino Americans will be the majority. While the population at large is left to ponder these approaching trends and what they mean, in the delivery rooms of America these demographics are not approaching trends, but the current norms. According to some of the most recent estimates, white babies constituted fewer than half the babies born in 2013; however, this has been long in the making as today only 51 percent of Americans under the age of 18 are white (Cohn 2016).

These demographic changes have been of interest to researchers and examined thoroughly. However, there has been limited

examination of the intersection of these trends. My research attempts to explore the possibility that these trends not only correlate, but interact and drive each other. So far, there has been the general assumption that the healthcare system has been getting worse across the board, not only for one particular group, but for the whole nation. I am looking into the possibility that is it not entirely due to the worsening of healthcare, in general, but to the changing demographics driving up the maternal death rate in our country. It is understood that women of color in this country are more likely to receive less than adequate care than their white counterparts. There is the possibility that everyone is receiving the same level of care they would have ten or fifteen years ago, yet as white women become a smaller portion of the women giving birth, the plight of women of color, especially black women become more pronounced and notable in the national averages.

Statement of purpose

The goal of this research is to examine maternal healthcare in the United States through the lens of racial and ethnic disparities as well as to examine the effects. The aim is to explore possible correlations between the changing demographics of mothers to the gap in American healthcare in relation to other developed nations. It will also investigate some possible cultural causes for the high maternal death rates in the United States over all as well as specific demographics, such as disparities in access to healthcare and pre-existing conditions. It will also attempt to look at the intersectionality of these factors and what happens when they compound.

Literature Review

Prenatal health and pre-existing conditions

There are several pre-existing health conditions, that have been exacerbated by demographic differences. The first notable one is the opioid crisis. These health complications, often associated with an addiction to opioids, are impacting specific communities more than others. The vast majority of cases related to opioids and pregnancy complications are occurring in rural, predominantly white, and low socio-economic backgrounds. There have been some claims and studies suggesting that the opioid crisis might be having an effect on the increasing maternal mortality rate, prompting some states to examine this (Texas Health and Human Services). However, for the purposes of this research this line of examination is not particularly useful. It has been shown that white Americans disproportionately suffer from opioid abuse, and opioid related deaths (Center for Disease Control). Thus, the opioid crisis if anything, may appear to close the gap between minorities and white women's death rates in the U.S., though for this reason it is possible that the gap is even larger than previously observed.

One important concept that has to be discussed in order to understand some of this information is the Hispanic Paradox. While the topic is a heated point of contention among many researchers it cannot be discounted, especially when it comes to birth. The Hispanic Paradox refers to the unusual data which shows that, despite more health risks, less access to healthcare, and generally lower socio-economic status, Hispanics (or Latinos) frequently have better health outcomes than their white counterparts. While there have been many studies and suggestions to ascertain why this is, from lower rates of smoking to higher community support systems, there has yet to

be a definitive answer as to the factors behind these trends. These trends are pronounced in maternal mortality. Hispanics/Latinos are at an increased rate of obesity and of having type 2 diabetes, yet still seem to have death rates comparable to their typically healthier white counterparts.

Even with this confounding variable of the rising Hispanic/Latino population, it is important to examine the effects and discrepancies of pre-existing conditions in the United States. Recent research indicates there has been a noticeable increase in pre-existing conditions that raise the chances of negative side effects and health issues for mothers and children (Admon 2017). These have been particularly marked in women from the lowest income quartile and from rural areas, as well as from mothers whose insurance plan is Medicaid.

These pre-existing conditions (e.g. asthma, hypertension, substance abuse and diabetes) had seen a sharp rise between 2006 and 2014. In the same time frame the number of white mothers decreased, from approximately 56 percent to 49 percent, while the number of Hispanic mothers increased, from around 20 percent to 24 percent, and most other groups stayed relatively unchanged (US Census Bureau). Black and Latino communities, especially women, tend to have higher rates of some of these conditions such as diabetes, hypertension, and poorly controlled asthma.

While a lower income has long been linked to worse healthcare, including having a higher risk of death (Marmot 2002) or a negative perception of health (Hero 2017), this has been especially pronounced in the United States. This is a factor that is being compounded in maternity wards because of demographic changes. As of 2016, black

Americans had a median household income of \$39,000, Latinos \$48,000, whites had \$65,000 (US Census Bureau). These numbers mean a greater portion of black and Latino families fall in the lower half and lowest quartile of income than their white counterparts. Thus, an increased share of women giving birth will be doing so within the context of lower wages and less wealth than before.

There is also a real wealth disparity in American families. Wealth is monetary value the family has saved or stored in assets such as real estate and vehicles. The 2008 recession hit all American families hard, particularly in the lower- and middle-income brackets. While most families have seen a resurgence of wealth, it has not been equal across racial and ethnic groups. Black and Latino families in both the middle- and lower-income ranges have seen themselves fall behind their white counterparts. In both groups, Latino families on average have one third and black families one fourth of the wealth of white families of equal income (Pew Research Center). This leads to particularly pronounced differences: middle income black families have wealth of around \$38,000 while white middle income families have \$155,000 in wealth. This difference in available funds influences what kind of care families are able to procure for pregnant women or mothers when there are complications during or after delivery, or even whether they can afford quality prenatal care.

About half of all pregnancies in this country are unplanned, with poor women now five times more likely than higher-income women to have an unplanned pregnancy, and six times more likely to have an unplanned birth (Guttmacher Institute). Given the economic disparities previously discussed, it is reasonable to say many of the

unplanned births are occurring to minority mothers. Unplanned pregnancies add risks for mother and child, such as lower rates of early neonatal care for either, because the woman does not know she is pregnant, and the high likelihood that the family is not financially prepared to expand.

There is also a continuing disparity between rates of teenage pregnancy in different communities. In the past two decades, there have been gains in decreasing teenage pregnancy, with a nationwide total decline of about 60% (Pew research center). While most groups experienced a drop very close to this, these drops did not correlate with equal number of births by racial or ethnic group. Within the teenage group, (defined as 15-19), Latina girls had a rate of 42 births per 100,000, compared to white teens whose rate was 19 per 100,000. Teen pregnancy is almost always unplanned and can pose serious health risks. The most common issues in teen pregnancy are anemia, increased risk of hypertension, the risk of the baby's head being larger than the pelvic opening, an issue more prevalent in teenage pregnancy (americanpregnancy.org). These risks combined with the differences in rate of occurrence, are most certainly a factor in the overall higher rates of maternal mortality and morbidity between racial and ethnic groups in this country.

Insurance

The American healthcare system is notoriously expensive and places much of the expense on the patient or their family. It is for this reason that insurance is so vital to American families and the outcome of their healthcare. Even so, many in America do not have healthcare, are underinsured, or pay steep premiums to maintain their coverage. Minorities have had lower rates of being insured. Even with the creation of the Affordable Care Act (ACA or Obamacare),

minorities particularly Latinos remain significantly under insured. Even today about 22 percent of Latinos are uninsured (U.S. Census); however, the number of Latino children uninsured is significantly lower, at around 8 percent, still twice as high as white children at 4 percent.

This lack of insurance affects where individuals can seek treatment, and the quality of treatment they can access. It is also necessary to examine the types of insurance to which different groups may have access. When the ACA went into effect, it had a serious impact on filling gaps in insurance in minority communities. For Latinos, its implementations saw 4 million additional people insured, in the black community it was an additional 1.8 million, and Asian-Americans saw their uninsured rate drop from 15 percent down to just 7 percent. These are strong and important gains for coverage in America; however, this coverage is not equal, because an unequal number of minority individuals and families are covered under Medicaid.

It is important to note that since the implementation of the ACA act, it is now required that women have healthcare for pregnancy included in standard insurance packages. Prior to this it was not required that insurance companies provide this kind of insurance and pregnancy was even treated as a pre-existing condition, and could be a reason for insurance companies not to cover women who were or had been pregnant. Even with these improvements there has not been a standardization of insurance and the coverage that Medicaid will offer differs between states.

“Because there is no formal federal definition of what services states must cover for pregnant women beyond inpatient and outpatient hospital care, states have

considerable discretion to determine the specific scope of maternity care benefits” (Kaiser Family Foundation). Because of the broad scope of coverage that can meet this definition, not all states or individuals have equivalent access. In a large study of states and Medicaid data, it was found that 45% of all births were covered by Medicaid in 2010 (Markus, 2013) and that number has most likely been going up since. “Most, but not all, of the 41 surveyed states report that they cover basic prenatal services such as ultrasounds and vitamins, prenatal genetic testing, home visits, delivery in birth centers, postpartum visits, and breast pumps for nursing mothers” (Gifford, 2017). Overall many programs do make a concerted effort to provide comprehensive services to mothers, though when it comes to unexpected complications that lead to maternal mortality or morbidity, there is significantly less information or preparation.

Hospitalization

In analyzing previous studies on racial differences in medicine it appears unlikely that the majority of discrepancies in numbers of deaths are simply prejudice from individual hospitals or providers, but something more systemic. It has been shown that minority groups often have worse health outcomes, even when in the same or very similar situations to white Americans (Maddox, 2017). It has also been shown that many minority groups disproportionately have pre-existing conditions that might make a pregnancy riskier, such as diabetes (Spanakis, 2013) or heart disease (Kurian, 2007). It is for these reasons that it is important to examine pre-existing conditions or predisposition to health issues as a factor in different mortality rates. The main causes of maternal death, though varying slightly in percentages between states and over time, were cardiovascular diseases, non-cardiovascular diseases, cardiomyopathy,

thrombotic pulmonary embolism, infection, hemorrhaging, or a hypertensive disorder. In any given woman, developing any one of these issues is a major risk, and some populations are at an increased risk for development; however, even with those heightened risks outcomes are not as expected.

The leading causes of death and complications come from cardiovascular disease and issues associated with it. This is most certainly a strong factor in disparities because minorities, and more specifically African Americans, are disproportionately at risk for these issues. “Cardiovascular diseases are the leading cause of death in the United States, and disproportionate rates are seen in racial and ethnic minority populations” (Cardadelli, 2007).

Hemorrhaging and infection or sepsis, together account for approximately 1 out of 5 deaths (CDC), and these are risks which are heavily associated with also having Cesarean delivery. It has been shown that in the United States black women are consistently more likely to have their child/children delivered via Cesarean section. They are also particularly more likely to have unplanned Cesarean sections. Both black and Asian American women are about 20% more likely to have a C-section than white women (Getahun, 2009). Having C-sections is riskier and often causes a longer healing time, and increasing risks of not waiting long enough before restarting normal activity.

The reason all these factors are important is because minority women have higher rates of maternal morbidity even when they do not die. It is estimated that for every instance of maternal mortality there are 100 cases of maternal morbidity, defined as a life risking complication (which does not

necessarily result in death) (Callaghan, 2003). There is also a clear correlation with minority women, particularly black women, experiencing these instances at a much higher rate than the rest of the population. A particularly poignant study found that institutions that predominantly serve black women have significantly higher rates of maternal morbidity per 100,000 women.

Discussion

Patterns

Overall it was observed that pre-existing circumstances and conditions by their very nature were contributing to disparities. Many of these risks were compounding in minority communities before women had even conceived their children. The economic gap is widening between the poorest and richest Americans, as well as increasing drastically between white and non-white families. Diminished financial security has been linked to worse health outcomes and, as the minority population shifts to the majority, these issues will exacerbate the frequency of negative maternal health outcomes.

The Hispanic Paradox did have significant effects on outcomes. While many of the pre-existing social and health conditions were similar in both black and Latino communities, Latinos routinely fared better in mortality rates, even when both groups had high rates of morbidity. There is also significant room in this field to try and examine differences within the Latino community. Though I did not have much time to dwell on the disparities, I did note that in the New York City Maternal Morbidity report the Latina mothers were split into different groups and those that were likely to have a darker complexion, or more likely to identify as racial black tended to see worse outcomes.

There were also a host of issues which, while appearing more prominently in communities of color are also affecting white mothers and will most likely become more apparent in the near future. The issue of abnormally high rates of Cesarean delivery in the U.S which, by nature of being an invasive surgery, includes higher risks is most prominent in black mothers, but does affect everyone. In examining the high economic disparities and rates of unintended pregnancy in different socioeconomic groups as mentioned, it is also evident that white mothers with lower socioeconomic backgrounds are also experiencing an increase of mortality inducing issues.

All in all, mothers with pre-existing conditions, be it biological, financial, or socially related are becoming the new norm rather than outliers. The American healthcare system needs to prepare and train for the prevalence of pre-existing conditions in mothers across the nation.

Critique of Sources

One of the largest difficulties in looking at the discrepancies between different groups in the United States is the way demographic data is collected. Because race is a social construct, there is no way to definitively place anyone into one category. In most cases, racial identity is collected by self-identification, which even in the best of cases is not always fully clear. In a country like the United States, which has been a hotbed of ethnic mixing, very few people are truly one “race.” However, because this study is looking at social rather than medical interactions, “race” is more useful because it is more linked to the experiences people are likely to have within the medical world, beyond simply biology, especially in a society that is racially coded.

A significant problem in examining the demographic discrepancies is the rise of Latino/Hispanic Americans. American society is very racially oriented, and the differences and distinctions between racial groups is often emphasized and Latino/Hispanic Americans pose a problem to these strict divisions and fluctuation in the data. Because Hispanic/Latino is classified as an ethnic group, this means that the person is allowed to mark this category as well as any other racial group they want which can skew results. There is an issue of what race Hispanics/Latinos would mark, as many are a combination of European, African, and Native American ancestors. Many Hispanics/Latinos also will opt to not mark any race at all, feeling they do not align with any option.

Within the Hispanic/Latino group, there is also a wide range of racial differences which often go unexamined. For example, women who are Afro-Latino (black and Latino) are most likely going to have worse mortality statistics than Latinos that identify as racially white, but there is very little data regarding this because they are either combined by ethnicity or divided by race. There is also the issue of discrimination in treatment or the relevance of pre-existing condition when some locations do not differentiate by this ethnic distinction.

There is also a change in the classification of Hispanics/Latinos, the term being used as an umbrella definition only gaining popularity in the mid-twentieth century and is still evolving. More frequently, it is being used as a racial classification both by internal structures as well as by individuals. Many people will only mark the ethnic category or opt to mark ‘other’ on the racial category. Many states will only record data from its most populous groups. For example, a state like Georgia whose population has long

been primarily made up of only white and black citizens may not properly record information on its Asian or Hispanic/Latino citizens, despite the fact that these two groups are the fastest growing populations in the United States. While on the other hand, states like Arizona will record information on white, Latino and Native Americans, yet place black mothers into the “other” category. Most states in fact have an “other” category, yet very few expand on who this other category is representing, and often the people in this category vary from region to region.

Another racial group that is causing confusion is Asian Americans. In the past few years, Asian Americans have surpassed Latinos in terms of birth rate, and are becoming an ever-increasing share of mothers and children throughout the United states, yet many states still place them in an “other” category.

Quantitative Section

Introduction

The aim of the quantitative section was to compare how demographic changes might affect maternal mortality. While it is most certainly true that over the past decades there has been an increase in maternal mortality, at the same time there has been a demographic shift in many states to having more babies and mothers who are minorities. The main goal was to see if there appeared to be any correlation between the two trends.

Methods

Data Collection

For this research, following a trend of many other articles and reports, I have opted to exclude the data of California and Texas. While this most certainly raises an issue in terms of examining Latino trends, Texas and California being the two states with the most Latinos, the data in these states is difficult to draw into the equation. California, to its benefit, has seen a vast improvement over the past decade, with decreases in maternal mortality, contrary to that of the rest of the United States, so would not make a good option to show trends. The other state being left out is Texas. Texas recently made headlines about having an extremely high rate of maternal mortality. However, there have been a host of articles that have come out criticizing the data collection methods and have revised the data resulting in several different conclusions. Ultimately, this conflicting data makes Texas’s data even more unreliable than most, to the point of being too convoluted to be useful.

In 2003, the United States created a new small questionnaire on death certificates to attempt to better collect data on maternal mortality. It provides a check box asking if the deceased woman was pregnant within 42 days before death, or within a year before death. This idea was submitted because prior to this many states had differing systems or did not have any pregnancy related question. However, there were some difficulties surrounding this new question, because many states did not immediately adopt it (Declercq, 2017). Part of the increase in maternal mortality in the U.S. was due in part to this improved collection method. This is also part of the reason the CDC decided to not put out yearly reports because, as this question was implemented over the past decade, many states began to have drastically different rates of mortality. In an attempt to mitigate these discrepancies, I chose states all of which had

implemented this question within a certain time range, in an attempt to keep the data jumps in certain year groups.

I collected data from the CDC's Wonder tool. It provides data on the number of maternal deaths, broken down by both race and Hispanic origin. It also has the record of births in an individual state or group of states. Although we have high rates of maternal mortality, due to a relatively limited population size, death from a pregnancy-related cause is actually numerically small. When numbers are small they create unstable statistical analysis, and become unreliable. In order to have large enough numbers to be useful I collected data combined from several years, using Wonder's system. These numerical gaps were either 3 or 4 years, because unfortunately the years were not easily divisible by 4. Fortunately for this project, I was examining rates and percentages, so the numerical differences between 3 and 4 years was mostly canceled out.

I initially began with 27 states and the District of Columbia, that had implemented the new pregnancy question between 2003 and 2009. These states were Arkansas, Connecticut, Delaware, Florida, Georgia, Idaho, Illinois, Indiana, Kansas, Michigan, Montana, Nebraska, Nevada, New Hampshire, New Jersey, New Mexico, New York, North Dakota, Ohio, Oklahoma, Oregon, Rhode Island, South Carolina, South Dakota, Utah, Washington, Wyoming, and Washington D.C. Within these states, some had too few births and deaths to be used for analysis, and so were removed. These states included Delaware, New Hampshire, North Dakota, Rhode Island, South Dakota, Wyoming, and Washington D.C. This brought my number of states down to 21, just a few below half of the U.S. geographically. However, even using these

methods rates of mortality still demonstrated a very large range between states.

The year ranges I used were 1999-2002, 2003-2006, 2007-2009, 2010-2013, 2013-2016. The first two were provided that way by Wonder because natality was separated into three pages, 1995-2002, 2003-2006, and 2007-2016. While the differences in number of years between categories make plain numerical comparison difficult, this project aims to examine the information by percentages and rates, so the differences numerically should be generally mitigated by this.

Then, using the CDC WONDER system, data from each state was pulled in each subsection of years. The data consisted of the individual number of women whose cause of death was linked to a pregnancy related issue, individual number of births, and the demographic breakdowns of both groups. The rate of maternal mortality was calculated per 100,000 women by dividing the number of deaths by the number of births. This was broken down into the categories of overall death per 100,000 by white, black, Latino, Asian, and Native American, though it is important to note that because of a lack of data Asian and Native American, rates of mortality were not used for analytical purposes. The other categories calculated were the percentage of babies born from each group, and finally the difference between the rate of mortality between black and white women in each state.

Data Analysis

The primary method of analysis was comparison of categories and linear regression models to examine their correlation. The methodology was fairly straight forward. Using the programming tool Rstudio the different categories previously

mentioned (such as percent of mothers who were white, the rate of mortality for Latino mothers), were compared to examine possible links between demographics and different outcomes. The base R-code used to create these models and their linear regressions is shown below.

```
ggplot(data = cdcddata2) +  
  geom_point(mapping = aes(y = _____,  
  x = _____, color = state))+  
  geom_smooth(method = lm, aes( y =  
  _____ , x = _____))
```

After graphing the different combinations, the summary statistics were pulled, with the intercepts, slope, and deviations. This was done by assigning the linear regression data of one of the comparisons to a shorter call name, Mod1 through Mod13, and then the summary was examined. A sample of code for this method is shown below, and the summary statistics are included with the graphs of all the different models.

```
> mod7 <- lm( Overall.Death.Rate ~  
percent.latino , data = cdcddata2)  
> summary(mod7)
```

The summary then produces important statistical numbers related to the linear regression, the most important for this use being *Coefficient - Pr(>t)*, *r-squared*, and *the F-statistic*.

The *Coefficient - Pr(>t)* is important because it allows us to reject the null

hypothesis, which in all cases would be the idea that the two variables are unrelated. This is looking to see if what we observed could be random or just a coincidence. It is generally accepted to say that less than 5 percent, .05, is a good judge to say the connection is not due to chance.

R-squared is important because it displays how correlated all the data points are to the line of regression, so the higher the number the better the data fits the line. In essence, it is examining the percent of variance in one variable that can be explained by the other variable. Thus, the closer to 1 the better.

The F-statistic again looks at how good of an indicator of how well the predictor variable (x-axis) is at affecting the response variable (y-axis) the higher the number the better. The F-statistics should be greater than 1 to determine if we can reject the null hypothesis (which is always that there is no relation between the variables).

Results

The graphs were created using the code above in Rstudio, with the tool ggplot. Each state was given an individual color, however data between years was not emphasized on the graph for purposes of clarity. Below is the color chart for each different state. They are included here and not next to each graph for organization purposes.



Figure 1: Cities Color Chart

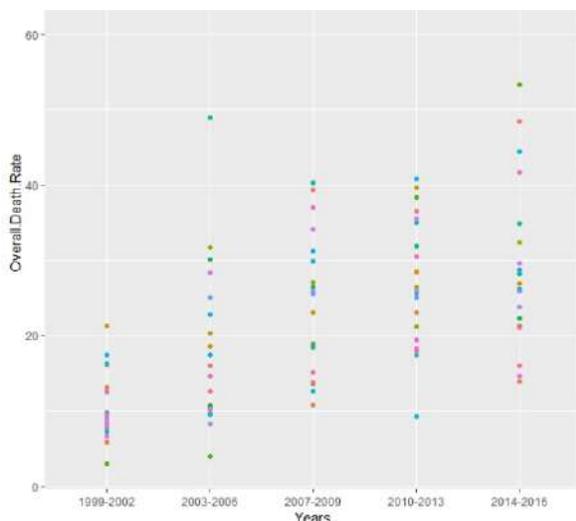


Figure 2: Overall Death Rate per 100,000 births by Year. This figure easily displays how in general the rate of death in the different states has appeared to “increase” as data collection methods have become more accurate. Unfortunately for an unknown reason the linear regression models would not run on this model.

Coefficients: Estimate Std. Error t value Pr(>|t|)
 (Intercept) 15.5511 4.9150 3.164 0.00217 *
 White.Death.Rate 0.9813 0.2071 4.738 8.7e-06 *
 Residual standard error: 23.36 on 84 degrees of freedom(16 observations deleted due to missingness)
 Multiple R-squared: 0.2109,
 Adjusted R-squared: 0.2015
 F-statistic:22.45 on 1 and 84 DF,p-value: 8.703e-06

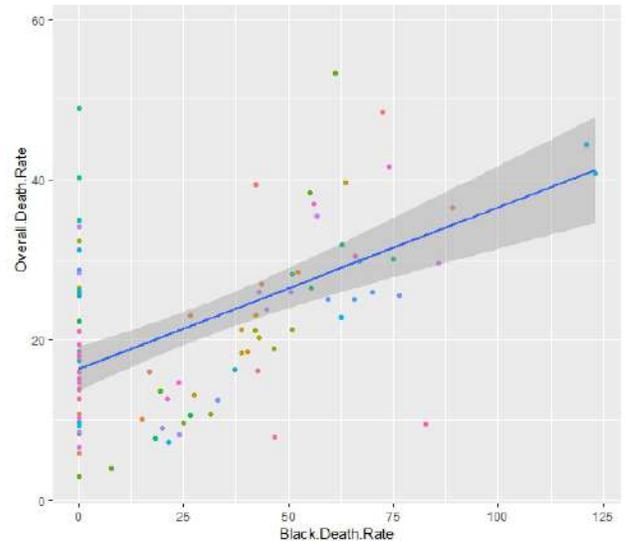


Figure 3: Rate of Overall Mortality vs Rate of White Mortality

Coefficients: Estimate Std. Error t value Pr(>|t|)
 (Intercept) 16.35509 1.41022 11.598 < 2e-16 **
 Black.Death.Rate 0.20179 0.03346 6.031 2.88e-08 **
 Residual standard error: 10.38 on 98 degrees of freedom (2 observations deleted due to missingness)
 Multiple R-squared: 0.2707, Adjusted R squared: 0.2633
 F-statistic: 36.38 on 1 and 98 DF, p-value: 2.884e-08

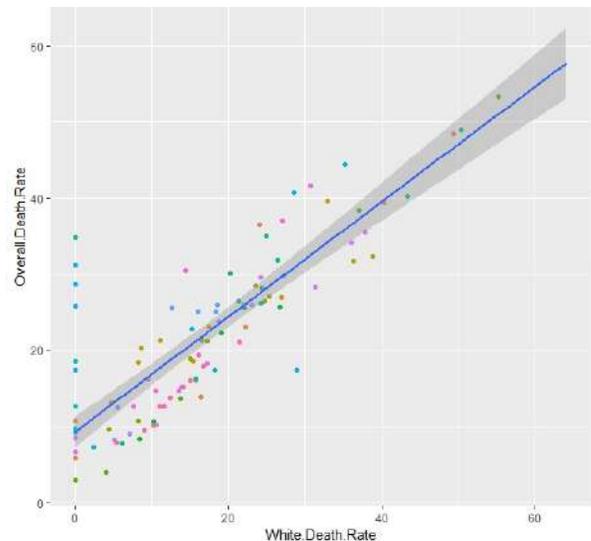


Figure 4: Rate of Overall Mortality vs Rate of Black Mortality

Coefficients: Estimate Std. Error t value Pr(>|t|)
 (Intercept) 16.35509 1.41022 11.598 < 2e-16 **
 Black.Death.Rate 0.20179 0.03346 6.031 2.88e-08 **
 Residual standard error: 10.38 on 98 degrees of freedom (2 observations deleted due to missingness)
 Multiple R-squared: 0.2707, Adjusted R-squared: 0.2633
 F-statistic: 36.38 on 1 and 98 DF, p-value: 2.884e-08

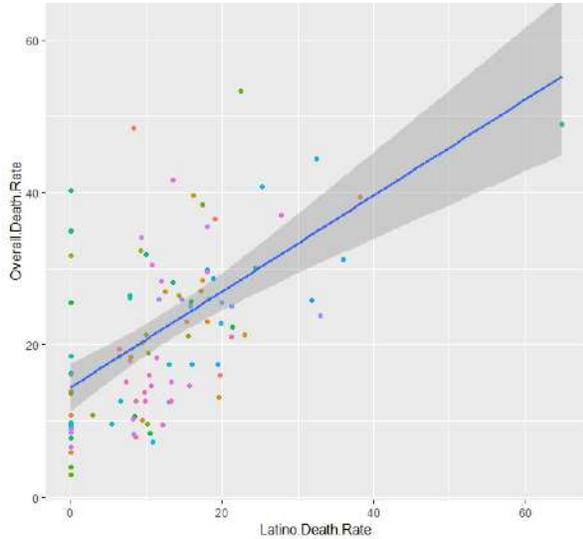


Figure 5: Rate of Overall Mortality vs Rate of Latino Mortality

Coefficients: Estimate Std. Error t value Pr(>|t|)
 (Intercept) 26.38852 5.49037 4.806 5.42e-06 ***
 percent.white -0.06587 0.08541 -0.771 0.442
 Residual standard error: 12.04 on 100 degrees of freedom
 Multiple R-squared: 0.005912, Adjusted R-squared: -0.004029
 F-statistic: 0.5947 on 1 and 100 DF, p-value: 0.4424

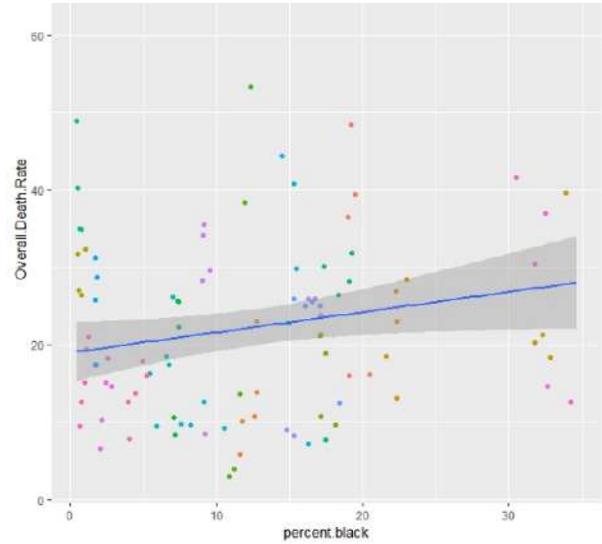


Figure 7: Overall Mortality Rate vs Percent of Women who were Black

Coefficients: Estimate Std. Error t value Pr(>|t|)
 (Intercept) 24.4125 2.1813 11.192 <2e-16 ***
 percent.latinno -0.1221 0.1036 -1.179 0.241
 Residual standard error: 12 on 100 degrees of freedom
 Multiple R-squared: 0.01371, Adjusted R-squared: 0.003845
 F-statistic: 1.39 on 1 and 100 DF, p-value: 0.2412

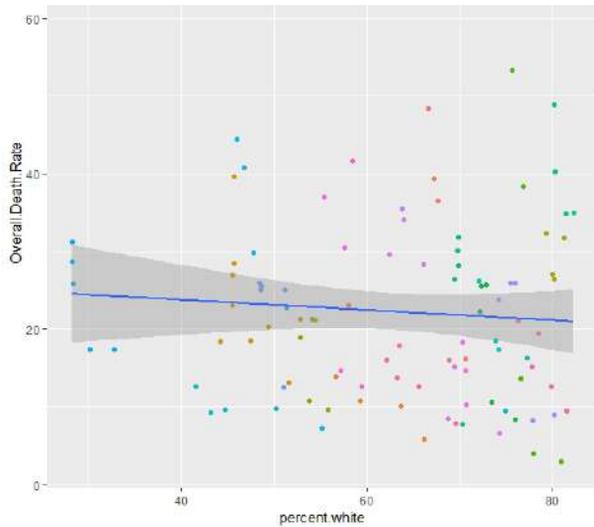


Figure 6: Overall Mortality Rate vs Percent of Mothers who were White

Coefficients: Estimate Std. Error t value Pr(>|t|)
 (Intercept) 18.9836 1.9526 9.722 4.02e-16 ***
 percent.Black 0.2616 0.1249 2.094 0.0388 *
 Residual standard error: 11.82 on 100 degrees of freedom
 Multiple R-squared: 0.042, Adjusted R-squared: 0.03242
 F-statistic: 4.384 on 1 and 100 DF, p-value: 0.03881

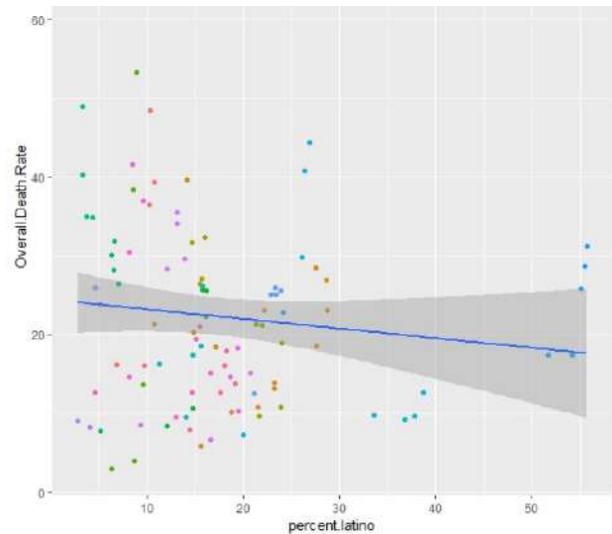


Figure 8: Overall Mortality Rate vs Percent of Women who were Latina

Coefficients: Estimate Std. Error t value Pr(>|t|)
 (Intercept) 11.65800 1.65961 7.025 2.86e-10 ***
 Black.Death.Rate 0.18394 0.03937 4.672 9.52e-06 **
 Residual standard error: 12.21 on 98 degrees of freedom
 (2 observations deleted due to missingness)
 Multiple R-squared: 0.1821, Adjusted R-squared: 0.1738
 F-statistic: 21.82 on 1 and 98 DF, p-value: 9.52e-06

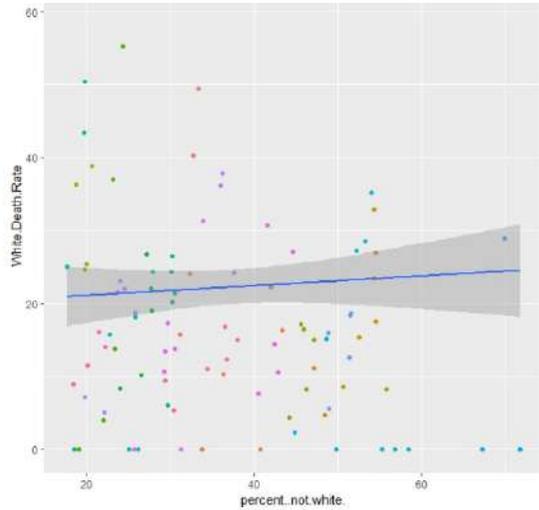


Figure 9: Rate of Mortality for White Mothers vs Rate of Mortality for Black Mothers
 Coefficients: Estimate Std. Error t value Pr(>|t|)
 (Intercept) 23.16820 3.76468 6.154 1.57e-08 **
 percent.not.white -0.16074 0.09463 -1.699 0.0925 .
 Residual standard error: 13.34 on 100 degrees of freedom
 Multiple R-squared: 0.02804, Adjusted R-squared: 0.01832
 F-statistic: 2.885 on 1 and 100 DF, p-value: 0.0925

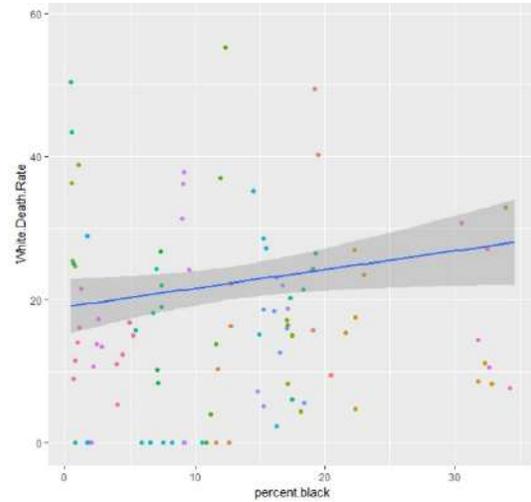


Figure 11: Rate of Mortality for White Mother vs Percent of Black Mothers
 Coefficients: Estimate Std. Error t value Pr(>|t|)
 (Intercept) 23.3620 2.3482 9.949 < 2e-16 ***
 percent.latin0 -0.3500 0.1115 -3.139 0.00223 **
 Residual standard error: 12.91 on 100 degrees of freedom
 Multiple R-squared: 0.08968, Adjusted R-squared: 0.08058
 F-statistic: 9.852 on 1 and 100 DF, p-value: 0.00223

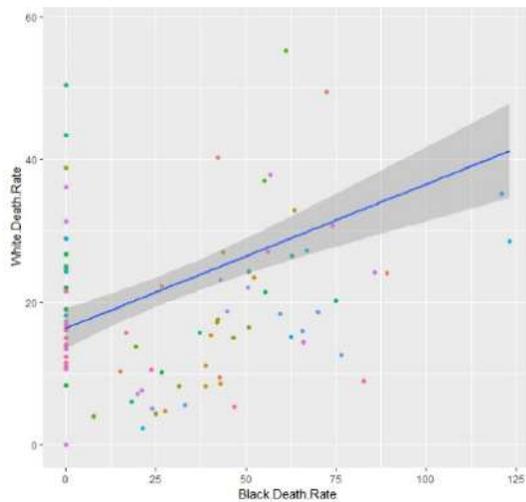


Figure 10: Rate of Mortality for White Mothers vs Percent of Non-White Mothers
 Coefficients: Estimate Std. Error t value Pr(>|t|)
 (Intercept) 14.9285 2.2175 6.732 1.07e-09 ***
 percent.black 0.1800 0.1419 1.269 0.207
 Residual standard error: 13.43 on 100 degrees of freedom
 Multiple R-squared: 0.01584, Adjusted R-squared: 0.006
 F-statistic: 1.61 on 1 and 100 DF, p-value: 0.2075

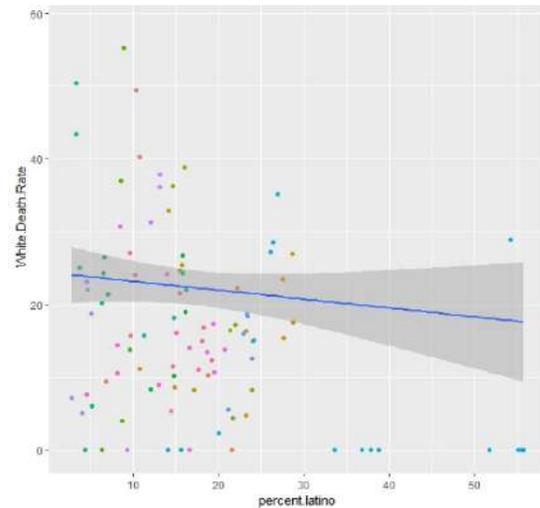


Figure 12: Rate of Mortality for White Mothers vs Percent of Latina Mothers
 Coefficients: Estimate Std. Error t value Pr(>|t|)
 (Intercept) 27.9408 4.8569 5.753 4.02e-07 ***
 White.Death.Rate 0.1429 0.2092 0.683 0.497
 Residual standard error: 20.26 on 55 degrees of freedom
 (45 observations deleted due to missingness)
 Multiple R-squared: 0.008409, Adjusted R-squared: -0.00962
 F-statistic: 0.4664 on 1 and 55 DF, p-value: 0.4975

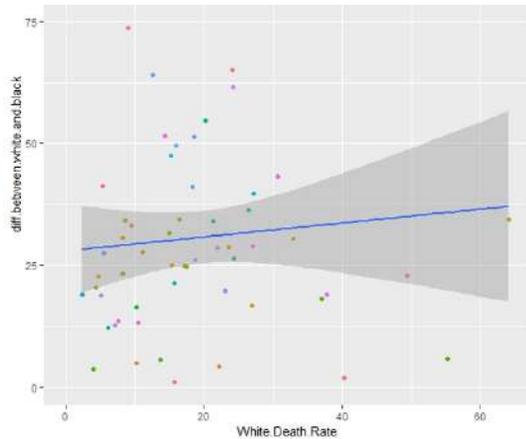


Figure 13: Difference in Mortality Between White and Black Mothers vs White Mortality
 Coefficients: Estimate Std. Error t value Pr(>|t|)
 (Intercept) -3.94662 3.14537 -1.255 0.215
 Black.Death.Rate 0.69220 0.05634 12.286 <2e-16 **
 Residual standard error: 10.51 on 55 degrees of freedom
 (45 observations deleted due to missingness)
 Multiple R-squared: 0.7329, Adjusted R-squared: 0.7281
 F-statistic: 151 on 1 and 55 DF, p-value: < 2.2e-16

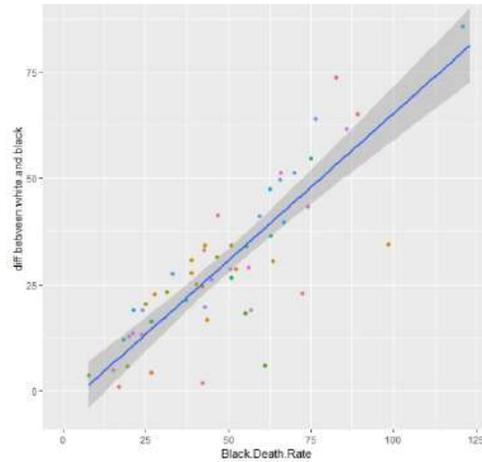


Figure 14: Difference in Mortality Between White and Black Mothers vs Black Mortality

Discussion

The CDC has an agreement with most states to not produce a site or official document with nationwide statistics or comparisons. This seems to be for several reasons, primarily the lack of agreement on how to put together this information. Many states do not communicate with each other on the methods they use to collect their information.

It is important to note that due to the aforementioned pregnancy associated death question developed in 2003, many states will have inevitably witnessed jumps in their data when the question is implemented. While I attempted to correct my data for these unequal applications, by controlling for the year range in which these changes

occurred, different states inevitably had different levels of increase from their prior data collection methods.

There is also the issue of “other” or “unknown” categories in racial or Hispanic origin information. With Wonder’s data, this is fortunately a somewhat small percentage of the individuals recorded. In any given state, the percent of individuals whose race or Hispanic origin was unknown typically only ranged from .5 percent to 2.5 percent, heavily skewed towards lying between .5 percent and 1 percent, at least in the states that were part of my data set.

However, it is pretty evident based on the graphs above that the data does not particularly lend itself to strong numerical

links. Many of the graphs fall into the zone of statistical significance, meaning the likelihood that the two categories are completely unrelated is low, but the correlation is so low that it also would be nowhere valuable enough to demonstrate a causation or contributing factors.

While the correlations found among some of the different categories were intriguing and some could offer interesting insight in the future, the results here should generally be considered inconclusive. As sighted by other groups and organizations the discrepancies between data collection methods in different states renders the correlations and comparisons between different states statistically useless.

With the prior statements in mind, there is however one finding, which I believe is very revealing. The information is in the 13th and final model displayed above. On the Y-axis, it has the numerical difference between the rate of maternal mortality of black mothers, and the rate for white mothers, and on the X-axis, it displays the rate of maternal mortality per 100,000 women for black mothers. What this shows is that there is an important racial element to the disparities of black mothers. If race played no part in the differences, then white women and black women should be doing equally well or equally poorly. Take for example Arkansas and Kansas on the graph, both are between 40-60 deaths per 100,000 for black women, relatively poor rates by any means, but the difference between black and white women is very low, meaning while the states have difficulty with maternal mortality rate, it is not likely to have race as a compounding factor in these issues. This comparison has an extremely high correlation rate and statistical significance. In the qualitative side of the data I was not looking for such exacerbated racial differences within the

same state, and so I cannot pinpoint what might be causing these racial differences. This would be the most interesting finding, and would have been something I examined more carefully during this research had I known before starting.

Conclusion

Though the results of the analysis were numerically inconclusive, the quantitative elements in conjunction with the qualitative section point to an emerging issue in the United States that currently lacks in-depth examination, but could soon hold vital information. Even with the inconclusive evidence, the quantitative elements hint at the problem that qualitative sources have thus far been better at revealing, which is that there are real issues and disparities in maternal health. In the qualitative research a picture emerges of increasing risks to mothers, and a higher percentage of births to minority women and women in lower economic settings, often both.

This research project began as a way to try and determine if the changing demographics in America were correlated with the rapid increase in maternal mortality in the country. The most important finding the research unveiled is the concept that deaths in the United States do not seem to be increasing at the alarming rate often touted in news sources. It turns out that the main cause of increase is in fact the standardization of data collection rather than a sudden spike in deaths. However, the research has revealed that as the process of collecting information about maternal mortality is standardized, the numbers will reveal the serious gaps that seem to exist in this country, specifically regarding disparities between different ethnic, racial, and socioeconomic groups that do pose a

real problem in maternal care in the coming decades.

The standardization of data collection of maternal mortality in the United States is a truly pressing issue that needs to be resolved as soon as possible. At the current time the

data is not collected in such a way that allows the insights we need to fully understand the nuance of the current situation. We most certainly have a problem with maternal mortality in this country, and now that the collection process has become more standardized it needs to be addressed.

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COUNSELING UTILIZATION BY MINORITY STUDENTS ON COLLEGE CAMPUSES: RACE & CULTURAL SENSITIVITY

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Abstract

Although minority college students exhibit higher levels of distress and need for mental counseling, there is little research on such students' utilization and benefits of counseling services (Kearney, Draper & Baron, 2005). College students who sought counseling reported an academic improvement and overall improved lifestyle in general (Bentley, 2018). Through a constant comparative method, the research study tries to investigate if cultural sensitivity and race influence the lack of mental counseling utilization among these racial/ ethnic minority students. As anticipated, cultural sensitivity and race are a contributing factor. The cultural stigma attached to mental counseling is extremely high within these cultures that even those students who choose to seek help attributed their decision to the lack of trust or unfamiliarity to the race of their therapists as those who saw a therapist or counselor of the same race or status as them, reported better outcomes of treatment. Recruiting more minority therapists does not necessarily guarantee the increase in help-seeking among this student population, but as Kim (2006) suggests, having more minority counselors on campus will help reshape the minority perception of counselor and ultimately break that stereotype.

Keywords: minority college students, mental health counseling, minority counselors

Introduction

Mental health concerns among college students have been identified as a public health issue as it leads to more complications later in life (Eisenberg, Hunt, Speer & Zivin, 2011). In fact, students who utilized mental counseling services reported an overall improvement in their academic performances (Bentley, 2018; Hechinger Report, 2017). Although there has been an increased emphasis on multicultural awareness in counseling in the last decade, little research has examined counseling utilization and outcomes for ethnic/racial minorities on college campuses (Kearney, Draper & Barón, 2005). It is very important to acknowledge that most minority students have underlying issues outside of their academic work, which they may already be struggling with. And most of these issues cannot be resolved without counseling

interventions (Brummit, 1975; Kim, Park, La, Chang, & Zane, 2016). Through a comparison of counseling centers and research studies conducted across different colleges across the United States, the research will identify the different pattern of help-seeking among minority students. The findings from these studies are; ethnic/racial minorities utilize are more likely to open up to counselors who are of the same race as them (Brummit, 1975; Camacho, 2016; Kim, 2006) or those perceived to be culturally sensitive and those they trust. In that case, strategies that are geared towards minorities must be put in place to increase help seeking among such populations

Literature review

The lack of diversity among counseling staff in the United States is attracting more

students of color into mental health counselor program at the University of Colorado, Denver (Estrada, Garcia, Hipolito- Delgado, 2017). In their research conducted on the experience of students of color from U.S. Western colleges counsellor educator programs, Estrada, Garcia & Hipolito- Delgado (2017) found that, the diversity of faculty (50% at the time) leaders who were people of color prompted a sense of belonging on campus. Other students of color however reported feeling outcast, “marginalized” and socially inept while in class; such experiences left them questioning their academic performances as well. The lack of literature addressing the needs of these students of color indicates a problem that needs to be rectified. And, as the need for more culturally competent minority counselors is increasing, their research recommends for a more diversified staff and proactive mentoring programs to be implemented for students of color enrolled in the program.

Camacho (2016) of South Dakota State University has explored the perception of minority students on mental health. His research identifies key stressors that mostly impact minority students on colleges and how they choose to deal with it. Minority students who feel displaced or discriminated against on their respective campuses also experience a higher level of stress (Camacho, 2016). And even though these group of students may be experiencing a cry for help regarding their mental health, they prefer not to utilize counseling; and for those who do, it is often their last resort Camacho says. He also observed that, among the many barriers that minorities face with help seeking, the biggest is the connection they feel towards their respective counselor. Gallagher & Taylor (2014) as cited by Camacho stated that, white counselors make up 87% of college

counseling staff and with that, minority students are underrepresented due to the lack of diversity.

Bentley’s (2018) research conducted at the University of Plymouth, United Kingdom examined the Sfard’s Acquisition and Participation metaphor (learning takes place in two forms; learning by acquisition or by participation) to show that, counseling help student achieve higher academic performances. The research which was published by the British Association for Counselling and Psychotherapy also suggests that, counselling facilitates learning, and isn’t just a medical intervention. Students who were interviewed for the research study attested to the fact that through the guidance of the counsellor, they enhanced their self-identity and expanded their reflective capabilities which ultimately lead to higher academic achievements (Bentley, 2018). Bentley’s study ultimately leads her to believe that counseling can be utilized as an educational strategy rather than a medical intervention to benefit students’ development academically and personally. This very approach can reduce the negative stigma attached.

Brummit (1977) admits that the rate of “attrition” minority students especially African-American Students from disadvantaged backgrounds face is so severe that it cannot be ignored. Brummit- a psychiatrist, was hired to oversee the Search for Education Elevation and Knowledge Program (SEEK)- a program which comprised of mostly blacks, and at the time run by a white male staff- at York University’s Division for Counseling and Development from 1971-1975. During his tenure at York, Brummit worked with students of all races. But based on his evaluation of the SEEK program which catered to minorities and students from

disadvantaged backgrounds, he concluded that, his being black facilitated communication among students who would otherwise not communicate with a white psychiatrist. Brummit went on to conclude that programs like SEEK are the only way minority students especially those from disadvantaged and low-income backgrounds can be fully immersed into the American mainstream.

Another group of researchers Eisenberg, Hunt, Speer and Zivin (2011) surveyed students 31,133 students across 26 different colleges to determine mental health counseling utilization rates; putting into perspective the different demographics of the student population (race, ethnicity, gender, sexual orientation, residency status etc.). The survey, which yielded a 40% response rate found that, 54.9% “prefer to deal with issues on [their] own.” With some students not realizing the urgency of their condition until it escalates (Eisenberg, Hunt, Speer and Zivin, 2011). A total of 47.3% see stress as being “normal” and therefore see no necessity in seeking help. The study concludes with a suggestion for technology-based approach which could encourage students’ help seeking behavior regarding mental health.

Tugen (2017), in her article by *The Hechinger Report*, addresses issues of racial incidences that occur on predominantly White STEM institutions; leaving minorities students feeling stressed and unsafe. In this article, Tugen (2018) emphasized the need for schools to invest in resources that are beneficial for the needs of minority inclusivity and not just diversity (recruiting counselling staff who are minorities and offering cultural awareness trainings). Miller (2018) also suggests that based on evidence, minority students exhibit a greater demand for mental services than any other group.

The availability of counseling services will help minorities cope with stressors and also increase their graduation rates as well (Miller, 2018). So, the question is, how do we get them to utilize these services For a possible solution, Kim (2006) in her article by the American Counseling Association (ACA) Journal emphasizes that, trained minority counselors will serve as “cultural brokers” between minority clients and non-minority counselors. Kim thinks minority counselors will serve as role models to minorities who are negligent in seeking mental help. And as a result, groups who have a negative connotation regarding mental counseling will benefit from testimonials of ethnic minority counselors who are of the same race. Ethnic minorities will also encourage more minorities to consider becoming counselors as well.

Often, universities have information regarding counseling services on their websites. For example, Creighton university counseling center acknowledges that “our ethnicity, racial and cultural backgrounds greatly influence our view of the world, our attitude and our behavior” in support of their recognition for diversity. They are also aware that minority students often have external stressors; family issues, racism and prejudice, self-esteem, classism, loneliness etc. aside from school stress that can toll with their mental health. But, they aren’t very specific as to what resources are channeled toward counseling minority students who may be experiencing such problems. And with such little information, students are not interested in help seeking or sometimes go outside of campus services.

Mental health awareness continues to spread across colleges campuses. But for minority students, there are several challenges and barriers that can hinder their ability to receive the appropriate care (Clarey, 2017).

One reason according to Dr. Ludmila de Faria (as cited by Clarey, 2017) is that historically, “people of color” generally underutilize counseling due to the stigma attached. Regardless, through shared experiences from those who have derived benefits from counseling, the supposed stigma will eventually come loose. A psychology professor at the University of Minnesota Richard Lee (as cited by Clarey, 2017), suggested that the system is flawed and does not favor minority mental needs. In his studies on minorities, Lee says, a threat to one’s culture ultimately impacts them in a negative way. Incidences of racism, prejudice and discrimination that is experience by these group of individuals therefore affects their mental wellbeing. The article concludes with some proposed approaches to improve mental health accessibility for minorities at the University of Minnesota.

To improve counseling utilization among the minority student population, schools such as Donnelly University- where minority students are the majority, a different approach called “Text, Talk, Act” was used to engage students in a round conversation regarding mental health. Nearly all students who participated said they were “less likely to utilize mental health services.” In the same article, 64 % of college drop-outs listing “stigma” as the reason for not seeking mental health counseling, according to the National Alliance on Mental Illness (NAMI) statistics (Lechliter, 2017).

Significance of study

In 1997, Gibbs conducted a research for three academic years at a Predominantly White Institutions (PWIs), to determine mental health utilization by black students. During his research he found that, fewer black students utilized the counselling clinic

compared to their white peers. The study which spanned from 1969-1972 academic years was intended to gather data on the intake of black students at the Cowell Health Center at Stanford University, the problems they presented and to evaluate the effectiveness of their therapeutic treatment approach. Gibbs learned that, black students stayed in therapy longer if they had a black therapist compared to a white one. Over the course of those 3 years, Gibbs (1997) also saw a decline in the number of black students’ utilization of mental health to which she assumed, was due to the increased black students’ enrollment or the expansion of services aimed at black students’ mental health needs. In her conclusion, Gibbs suggests confronting racial differences at first encounter between both client and therapist is key, to successful outcomes.

Tugen (2017) in her article for the *Hechinger Report* states “the polarized political climate is exacerbating;” keeping non-white students away from counseling services. The issue of not seeking mental help not only resides among black students but also Asian Americans Tugen (2017) proceeds. After witnessing the lack of diversity among therapists at Harvard, Karla Mendoza – who is Mexican American- and some of her fellow classmates, requested that nonwhite therapist be hired. Minority students have culturally unique stressors that can interfere with their mental health, but often they shy away from seeking help (Brown, 2016). In 2014, a black Harvard student name Stephen committed suicide.

For other students, the decision to seek counseling isn’t just dependent on race of the therapist but on the perception of biases and the lack of mutual interest between their view and those of the counselor (Leong, Wagner, & Tata, 1995 as cited by Constantine, Chen & Ceesay). Breland-

Noble (as cited by Tugen, 2017) admits minority students “who walk into a clinic and don’t see anyone who looks like them except the cleaning staff or the person at the front desk, they’re going to walk right out.” Mary-Ann Covey who is a psychologist and director of student counseling at Texas A&M University shared her experience with an African American student, who once told her that, “African- American people don’t trust white people in counseling.” This shows that, students who’ve already established trust issues with the counseling staff will not seek help even when they need it the most.

While many seem to think cultural diversity trainings and awareness programs are a great solution, Kim (2006) recommends hiring trained minority counselors to serve as “cultural brokers” between minority clients and non-minority counselors. In Kim’s perspective, minority counselors will serve as role models to minority students who are negligent in seeking mental help, especially those from cultural backgrounds where seeking mental health counseling is frowned upon. With ethnic minority counselors in the lead, cultures that hold a negative connotation towards mental counseling will benefit from a psychoeducation from a counselor of the same race; ultimately urging them to seek needed help without hesitation.

Methods

The research data was gathered and analyzed through a Constant Comparative approach. Constant comparative method as the name implies is simply collecting data regarding a topic of concern and comparing them to identify any themes as they emerge. After close comparison of sources, data can then be categorized based on different criteria to yield a finding. In this research, various scholarly reviewed articles and

research papers were gathered from Google Scholar, school websites, news publications, and PubMed. During analysis, I was able to identify similar patterns among research works and the findings of other researchers.

Findings

Minority students in general often choose not to utilize counseling services for many reasons. As I constantly compared various literature throughout this research, different themes began to emerge; ultimately leading me to believe that utilization rates are dependent on so many variables. One of the reasons is the racial or cultural stigma associated with help seeking. In some cultures, particularly the Asian or Black/African culture, help seeking is viewed as a sign of weakness, shame to the family or not of any significance. Often, issues regarding mental health are considered private and should therefore be addressed within the family. For others, religious institutions or external resources are an option as well.

Counseling, however, benefits students academically as it increases graduation rates and improves their future quality of life. Students who sought counseling admitted to benefiting greatly from it both academically and personally. Mental health issues develop early on in life and without proper care, they lead to significant psychological problems that require medical treatments (Eisenberg, Hunt, Speer & Zivin, 2011). Students who excel academically will have a potentially better future and quality of life which adds to societal values (Brummit, 1975).

With the help of APA guidelines, multicultural counseling and diversity trainings have proven beneficial in counseling these population of students. To leverage better outcomes, having cultural competency along with counselors who are minorities themselves will be key to

dislodging that stigma that cultures have about counseling or help-seeking (Kim, 2006). So, someone who is culturally competent by experience is more sensitive than someone who has been trained to be culturally competent or aware. The initiative can be achieved through the recruitment and retention of minority students in the counseling professions, providing support for them to attain professional trainings to which will enable them to serve as role models and maybe eventually, change the perception of ethnic /racial minorities towards counseling in general.

Limitation of the study

The limitation that were encountered during this study were those due to time constraint on data collection. the research time was short and data collection was based on secondary data source which were obtained through scholarly websites such as PubMed and university websites. No primary data was collected because the IRB process could not be obtained within such a short period of time. In the future, collecting primary data from the minority student population and narrowing it down to local schools will yield better results. Another limitation to the study is that, the data was collected on a broad scale and may not be generalizable to the entire population, but the research can be a used for future research to examine mental counseling interventions for minority students on college campuses.

Implications of the study

The study has been able to explore so many reasons why minority students choose to stay away from seeking mental counseling in times of need. An emerging team which observed throughout the study was that, more students rely on the support they get and receive from family and peers about the importance of seeking help. Even among emotionally and mentally sound individuals,

the need to consult about someone regarding mental health is emphasized. And as a minority, sometimes attending a college with fewer minorities, the challenge to keep up and fit in can take a mental toll on students. In such cases, with little or no support, students feel the need to request help somewhere else or try to handle things for themselves, and sometimes not in the best way possible. Therefore, it is in the students' best interest if colleges pay close attention to such students; closely identifying their needs, monitoring and checking for any red flags that may be difficult to notice in general counseling.

There are also organizations out there who are willing to establish partnerships with colleges and universities who are willing to implement programs that are geared towards the mental health and support of minority students. One of them is the JED foundation and another is the Steve fund. These organizations support colleges are making the effort to promote mental awareness among the minority population. Minority students exhibit different levels of stress and mental exhaustions caused by different culminating factors. Helping such students cope with these stresses will eliminate the mental toll that stress puts on them; increase their performance and improve their overall quality of life as well.

Some of the strategies that have this study recommend are the application of the *Sfard's participation and acquisition theory* (Bentley, 2018). The second program is known NITEO program and it is a program currently in use at Boston university. The third strategy will be training more minorities to become mental counselors and role models (Kim, 2006) in the field of mental counseling and assistance. Having minorities in such roles would be beneficial as Kim (2006) suggests and would help

bridge the gap between race and the cultural sensitivity that may arise during counseling. The fourth approach will be tackling mental counseling as in an educational vs medical intervention. This means that, instead of having a standardized counseling center, mental counseling can be incorporated in everyday learning within the classroom. This will help facilitate discussions that's students may otherwise not feel the need to share or address in a one- on- one session.

Lastly, the use of technology (Eisenberg, Hunt, Speer & Zivin, 2011) to target the minority student audiences. Today's generation is very technologically driven and motivated. Using social media platforms and other media outlets such as testimonials and videos from fellow students will help break the barriers for those who are hesitant in seeking help.

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GALLERY

