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A Letter from the Editors

JUR Press is proud to present Volume VI of the Journal of Undergraduate Research and Scholarly Excellence. With published work in the sciences, creative writing and literature, history, and art, this issue of the Journal is uniquely interdisciplinary and represents authors from around the world.

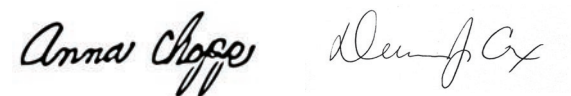
We are a journal for undergraduates and by undergraduates. Our slogan – linking the global undergraduate community – captures our mission to serve the interests of worldwide undergraduate thinkers, tinkerers, experimenters, writers, and artists. While JUR does provide a platform for students to publish and showcase their work, we also give students the opportunity to learn about the publication process from start to finish through internships as editors, operations associates, and referees. Our undergraduate network has grown to include not only international authors, but also affiliate and satellite editors from around the world! We are truly committed to enhancing the undergraduate experience, and we continually seek to engage as many undergraduate students in our organization as possible.

This year has been a transition and I am honored to have been chosen as JUR's new editor in chief as our outgoing editor in chief, Deanna Cox, moves on to pursue her graduate studies at Yale University. Shadowing Deanna and working closely with her, I have witnessed the strength, determination, and motivation that she put forth these past two years maintaining and growing JUR Press and it is bittersweet to see her move on from our organization. I, and each member of the JUR staff, wish her the very best.

For all that we have accomplished this year, I want to say how incredibly thankful I am for the efforts of each member of the JUR staff. You are exceptional individuals with a wide range of talents. I look forward for working with all of you in the coming year.

To our published authors, both Deanna and I congratulate each of you on your accomplishment and we are thankful to have been part of your undergraduate academic experience.

Yours truly and truly yours,



Anna Chopp and Deanna J. Cox
Co-Editors in Chief
The Journal of Undergraduate Research and Scholarly Excellence
JUR Press



Special Thanks

This publication would not have been possible without Colorado State University and the contributions of numerous advocates and benefactors.

JUR Press would like to thank our Faculty Supervisor, Dr. Mark Brown, the Faculty Advisory Board, and our Graduate Advisor Kate Wilkins. We would also like to thank our partners at the Autonomous University of the Yucatan in Mexico, and Schreiner University in Texas. Finally, thanks to Jessica Egner, JUR's first editor in chief, for her past and ongoing support as contributing editor and industry liason.

Congratulations to our graduating seniors: Alison Bleser, Deanna Cox, Madeline Gallegos, Poppie Gullett, Chris Haley, David Hinson, Nicole Smith, and Chris Vanjonack.

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Characterization of *Staphylococcus aureus* isolated from the nasal cavity flora of nursing majors

BY JENNIFER RATH, BREANNA CHRISTMAS, KRISTIN PICARDO, PhD, AND THERESA WESTBAY, PhD
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Abstract

Approximately 30% of people have the bacterium Staphylococcus aureus (S. aureus) in their nasal passages. Within this group, approximately 1-2% are colonized with methicillin-resistant S. aureus (MRSA), although many do not display any symptoms.¹ MRSA is an opportunistic pathogen that can potentially cause diseases such as pneumonia, skin infections and sepsis. MRSA infections are commonly grouped into two categories, hospital associated (HA) or community associated (CA) based on where the infection was acquired and the profile of antibiotic resistance. S. aureus and MRSA can spread between individuals through physical contact and presents a serious health hazard to patients if healthcare professionals are carriers. This research focuses on the detection and characterization of S. aureus strains found among a population of healthy nursing majors in multiple sections of a laboratory course at St. John Fisher College. Samples collected from the nasal passages of students were characterized using mannitol salt agar, Gram-staining procedures, blood agar, CHROMagar MRSA II and were subjected to antibiotic resistance testing. Based on the findings of this experiment, it is clear that S. aureus is present in healthy individuals. Results from the spring and fall trials demonstrated that S. aureus was present in 31% and 50% of the sample population respectively. Despite only one strain testing positive for MRSA, many other strains did exhibit antibiotic resistance similar to that of HA-MRSA. Our results reveal a vast array of S. aureus strains present in healthcare workers and support the argument that there needs to be increased awareness and policies to help prevent the transmission of infection to patients.

Introduction

Microorganisms known as normal microbiota, or flora, colonize the human body and are essential to human health. *Staphylococcus aureus*, abbreviated as *S. aureus*, is commonly found as part of the normal flora on the skin and within the respiratory tract. As of 2011, approximately 30% of people in the United States were colonized with *S. aureus*.¹ Although *S. aureus* is not always pathogenic, it can cause many different types of infections and is a significant cause of infections contracted while within a healthcare facility. From 1997 to 1999, *S. aureus* was reported as the leading cause of infections in the blood, skin, and respiratory tract, requiring over \$14.3 billion for treatment.²

This bacterium employs a variety of virulence factors in addition to drug-resistance causing a high mortality rate of about 20%.² *S. aureus* is able to avoid phagocytosis in the body by camouflaging themselves with specialized protein coats or by forming a biofilm.² It also has the capability of secreting chemicals that interfere with receptors of phagocytes and can lyse them leading to a higher survival rate.² These characteristics make *S. aureus* a cause for concern.

Methicillin-resistant *Staphylococcus aureus*, also known as MRSA, is a unique strain of *S.*

aureus that is resistant to several antibiotics; specifically methicillin, oxacillin, and penicillin with some strains now showing vancomycin resistance.^{3,4} The first methicillin-resistant *S. aureus* strain was identified in 1961.⁵ Since this first discovery, the prevalence of MRSA has grown substantially. MRSA is carried by about 2% of the general population, although many carriers do not show signs of infection.⁶ Previously, MRSA infections were reported to cause 1-5% of *S. aureus* infections in hospitals.^{1,7} Unfortunately, the spread of *S. aureus* and MRSA has not stopped at the healthcare setting. In recent years, the infection that originated in hospitals has also been reported in healthy individuals in the general public.⁸ Common symptoms of infection include boils, pustules, and skin rashes; however, severe infections can cause pneumonia, osteomyelitis, and bacteremia.³ MRSA is now considered a major public health concern because it is no longer isolated to healthcare facilities and is adapting to resist antibiotics.⁴ Many people are now carriers of *S. aureus* or MRSA, which puts them at an increased risk for developing an infection or spreading it to others.⁸

Based on risk factors, infection type, and susceptibility patterns, MRSA infections can be divided into two groups, community-associated (CA-MRSA) and healthcare-associated (HA-MRSA) infections.³ HA-

MRSA infections are typically found in patients in hospitals and long-term care facilities. Infections are also typically found in those who receive kidney dialysis treatments, cancer treatments, use illegal drugs through injection, or have had surgery in the past year. Symptoms of this type of infection tend to be severe and include infections of the blood, heart, lungs, and other organs, leading to fevers, chest pain, and fatigue.⁹ HA-MRSA infections account for 85% of all MRSA infections.¹⁰

Although MRSA first emerged as a healthcare-associated infection, it has now spread to the community outside of healthcare settings. CA-MRSA occurs in healthy people who may have been exposed in close contact with others in schools, day cares, sports teams, and prisons. In addition, CA-MRSA can be spread by sharing clothing, towels, razors, and sporting equipment due to its ability to survive on fomites.¹⁰ Many people are able to fight off the infection and never experience any symptoms, however people who have compromised immune systems may be unable to fight it off and become infected.

Not only do HA-MRSA and CA-MRSA differ in how they are contracted, but they also have differences in antibiotic resistance profiles and average age of people infected. HA-MRSA patients are usually older than

CA-MRSA patients. A study published by the *Journal of Clinical Microbiology* reported that the average age of a person with HA-MRSA was 54 while the average age of a person with CA-MRSA was only 39.¹¹ In addition, HA-MRSA strains are resistant to a wider range of non-beta-lactam antimicrobials than CA-MRSA. A study by Sievert et al. (2012) noted that HA-MRSA infections were, "...more likely to be resistant to ciprofloxacin, clindamycin, gentamicin, levofloxacin..."²³ Typically HA-MRSA is resistant to clindamycin whereas CA-MRSA is susceptible to clindamycin.¹² Therefore, susceptibility to antibiotics, along with other methods, has been described as an accurate method for determining whether an infectious strain is most likely HA- or CA-MRSA.

Healthcare professionals have been found to be common carriers of *S. aureus*. This poses a particular threat to the public given that patients are frequently immunocompromised or have open, post-operative wounds. Any healthcare personnel that are carriers of *S. aureus* could potentially spread the bacteria to a patient simply through contact with their hands. Intensive care units, neonatal intensive care units, and pediatric units are particular locations where transmission could present the largest threat to patients' wellbeing. Some patients of these units are young children who are premature, underdeveloped, or have undergone invasive surgeries, leaving them particularly vulnerable to *S. aureus* or other nosocomial infections. In 2011, Aswani and Shukla reported that of 202 participants enrolled in their study, 49 (24%) tested positive for carrying *S. aureus* and of this sample two (1%) were positive for MRSA.¹ Bharathidasan et al. (2011) collected 44 samples from the nasal passages of healthcare workers. From these, 39 (88%) were positive for staphylococci and two (5%) were determined to be MRSA.⁷

The increase in the number of healthcare workers carrying *S. aureus* and MRSA between these two studies is evidence that MRSA is an escalating threat to patients. This fact, along with the ease of transmission and potential lethality of an infection, warrant an argument for the screening of healthcare workers. If healthcare professionals test positive for *S. aureus* or MRSA, proper precautionary measures can be taken when encountering patients, especially those with compromised immune systems. With these infections on the rise, all healthcare professionals need to become more aware of proper hygiene procedures in order to reduce the spread of these dangerous bacteria.

Materials and Methods

Sample Collection

Sterile calcium alginate swabs were

moistened with sterile 0.85% NaCl saline solution. Each student volunteer inserted a moistened swab into their right nasal passages and twisted five times. This procedure was repeated with the same swab in their left nostril. To maintain anonymity, each sample was coded with a six-digit numeric sequence that only the volunteer recorded. The students who screened positive for MRSA were notified using the six-digit system and encouraged to follow up with their medical provider.

Mannitol Salt Agar

Immediately upon sample collection from the nasal passages, the swabs were plated on mannitol salt agar, abbreviated MSA, (BD BBL, Sparks, MD) to isolate *Staphylococcus aureus*. The sample plates were then incubated at 37°C for 24 hours. A positive result on MSA is classified as fermentation causing the agar to turn yellow, indicating the strain is *Staphylococcus aureus*. Each sample was observed for growth and fermentation of mannitol, and the results were documented.

Gram-Staining

An isolated colony from each sample above was stained using the Gram-staining procedure, and all resulting morphological characteristics were documented. This procedure was used to verify that our samples were consistent with the characteristics of *S. aureus*. Due to the composition of their cell walls, gram-positive bacteria, such as *S. aureus*, are able to retain the dye used in gram-staining and turn a violet color.

Blood Agar

All of the samples that were positive fermenters of the mannitol were plated onto Trypticase Soy Agar II with 5% sheep blood (BD BBL, Sparks, MD). Cultures were incubated at 37°C for 24 hours. Each strain was evaluated for hemolytic ability in order to help determine virulence. Hemolysis patterns alone do not determine MRSA or distinguish between CA-MRSA and HA-MRSA; however, the ability to lyse red blood cells is considered to be a characteristic of pathogenic bacteria. Beta hemolysis is defined as the complete breakdown of red blood cells while oxygen-sensitive beta hemolysis is a complete breakdown of red blood cells in an anaerobic environment. Alpha hemolysis is the reduction of hemoglobin to methemoglobin in red blood cells without destroying the cell walls. Gamma hemolysis is characterized by no lysis of red blood cells.¹³

CHROMagar

Isolated strains from MSA plates were

streak plated onto CHROMagar II plates (BD BBL, Sparks, MD). The plates were incubated at 37°C for 24 hours and results were interpreted and documented. The plates were scored positive for MRSA if the colonies were mauve-purple in color and negative for MRSA if the colonies were colorless. Blue growth was recorded as Methicillin-sensitive *S. aureus* (MSSA) as instructed by the manufacturer.

Antibiotic Resistance Testing

Overnight bacterial cultures were made for each strain using an isolated colony inoculated into 3mL LB broth. The overnight cultures were placed in an automatic shaker set at 110 revolutions per minute at 37°C for 24 hours. Using a micropipette, 100µL of each overnight broth culture was placed in a cuvette and tested using a spectrometer. Using 0.85% sterile NaCl solution, the OD600 of each solution was diluted to 0.12-0.14.

Each diluted solution was plated onto a Mueller-Hinton agar plate (BD BBL Sparks, MD) using a sterile swab. The swabs were used to make three smear plates of each strain. On the first two plates for each strain, four antibiotic testing disks (BD BBL, Sparks, MD) were placed using sterile forceps. Plate A contained clindamycin (2mg), oxacillin (1mg), linezolid (30mg), and doxycycline (30mg). Plate B contained rifampin (5mg), vancomycin (5mg), vancomycin (30mg), and a sterile blank disk. The third plate labeled plate E contained and oxacillin E-test strip (Biomerieux, Durham, NC).

All of the plates were incubated at 37°C for 24 hours. The resistance to each antibiotic was determined by measuring the diameter of the growth inhibition around each disk and specifically interpreted based on manufacturer instructions for each drug. E-test strips are used to deliver a gradient of concentrations of oxacillin to surrounding bacteria. The resistance for the E-test strip was determined by the level at which growth ceased at the bottom of the ellipse, per manufacturer instructions. Bacterial growth at a concentration of 4.0µg/ mL or greater is classified as MRSA.

Long-term Storage of Samples

All strains were preserved in 50% sterile glycerol and Luria Bertani (LB) broth and stored at -80°C for long-term storage for future testing and reference.

Semester Trials

Two separate trials were performed, one in the spring of 2013 and another in the fall of 2013. All protocols remained the same throughout both trials.

Results

The aims of this study were to identify the prevalence of *S. aureus* and MRSA within a population of nursing students and determine if the strains found in this population had characteristics of HA- or CA-MRSA. The results of this study show a need for improved precautions and educational programs to be put into place to prevent the spread of infection.

Spring 2013

A total of 36 samples were collected from a population of students at St. John Fisher College enrolled in BIOL 107L Microbes and Disease. Our sample size was relatively small due to our limited availability of willing participants who were considered to be a part of the healthcare field. We obtained 11 samples (31%) that were positive fermenters on mannitol salt agar, indicative of *Staphylococcus aureus* (Figure 1). Individual strains were identified and separated for further testing. From the 11 samples, 19 different strains of *S. aureus* were isolated. Isolated colonies from these samples were determined to be Gram-positive cocci.

When 18 of the 19 strains were plated onto blood agar, there were 12 strains that were β hemolysins with complete hemolysis, five that were oxygen-sensitive β hemolysis, and one that was a γ hemolysin with no hemolysis (Table 1 and Figure 2). Only 18 of the 19 strains were used for further testing because one strain was unable to be reproduced and isolated again after a second round of MSA plating. These 18 strains were then tested for MRSA; 13 of them tested positive resulting in purple colonies, five tested negative and resulted in colorless growth (Table 1).

The 18 strains tested on CHROMagar were evaluated further for antibiotic resistance. A total of 15 strains were susceptible to all tested antibiotics: oxacillin, linezolid, doxycycline, rifampin, vancomycin, and clindamycin. Clindamycin was the only antibiotic that showed variation in resistance patterns. Strains 363477 and 508236B were completely resistant to clindamycin; growth was not affected and the zone of inhibition was 0mm (Table 1). Strain 363477 showed no hemolysis and was negative on CHROMagar. Strain 508236B demonstrated oxygen sensitive hemolysis and was positive on CHROMagar. Strain 334475B had intermediate resistance with a zone of inhibition of 15mm (Table 1). Strain 334475B showed beta complete hemolysis and was negative on CHROMagar. When subjected to an oxacillin E-test strip, all of the strains were susceptible.

Mannitol Salt Agar Results for Collected Samples

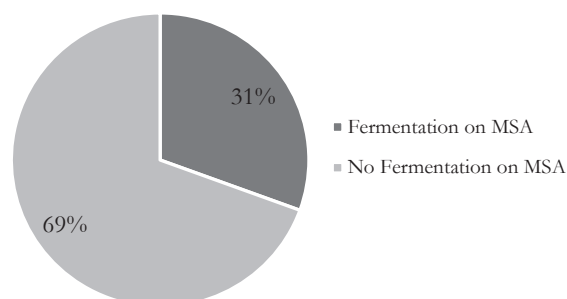


Figure 1. Percentage of samples showing fermentation on mannitol salt agar

| Strain Number | Hemolysis Pattern | CHROMagar Result | Clindamycin Susceptibility (mm) | Clindamycin Susceptibility Result |
|---------------|-------------------|------------------|---------------------------------|-----------------------------------|
| 307696A | β | + | 22.5 | S |
| B | β | + | 25 | S |
| 314347A | β_0 | + | 23 | S |
| B | β_0 | + | 25 | S |
| 334475A | β | – | 25.5 | S |
| B | β | – | 15 | I |
| C | β | – | 31 | S |
| 363477 | γ | – | 0 | R |
| 384972 | β_0 | + | 23 | S |
| 496584A | β | + | 22 | S |
| B | β | + | 23 | S |
| 508236A | β_0 | + | 25.5 | S |
| B | β_0 | + | 0 | R |
| 550261A | β | + | 23.5 | S |
| B | β | + | 22.5 | S |
| 564361A | β | + | 24.5 | S |
| B | β | + | 27.5 | S |
| 585468 | β | + | 24.5 | S |

Table 1. Characteristics of strains classified as *Staphylococcus aureus*. β indicates beta hemolysis; β_0 indicates oxygen-sensitive hemolysis; γ indicates gamma hemolysis. R represents resistance, I represents intermediate resistance, and S represents susceptibility to an antibiotic.

Hemolysis Patterns of Suspected *S. aureus* Strains

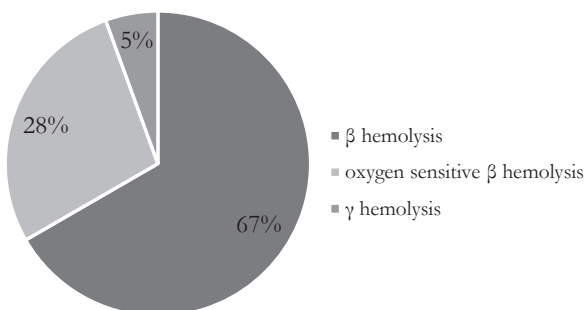


Figure 2. Hemolysis patterns for suspected *S. aureus* strains

Mannitol Salt Agar Results for Collected Samples

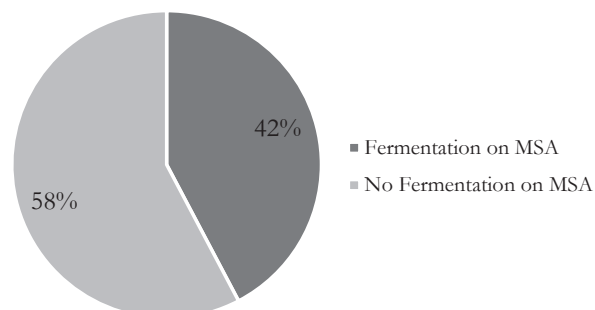


Figure 3. Percentage of samples showing fermentation on mannitol salt agar

Fall 2013

After collecting 26 nasal samples from St. John Fisher College nursing students, 11 samples fermented mannitol (Figure 3). These 11 samples produced 13 different isolates, which were all determined to be gram-positive cocci. Our sample size was relatively small due to our limited availability of willing participants who were considered to be a part of the healthcare field. Following gram staining protocols, the isolates were dyed and visualized under a light microscope. All of the samples were stained purple, indicating gram-positive bacteria. They were described as being cocci that assembled into “web-like” structures, indicative of *Staphylococci*. Due to these characteristics, 50% of the total sample size was considered *S. aureus*. Of the 13 isolates, 11 displayed β hemolysis, one displayed α hemolysis and one showed γ hemolysis when grown on blood agar (Figure 4).

Once the isolates were classified as *S. aureus*, additional testing was performed in order to determine antibiotic resistance profiles for each strain. We determined that six samples (46%) were intermediate or resistant to at least one of the six antibiotics tested (Table 2). Of the six strains, five demonstrated either intermediate resistance or resistance to clindamycin (Table 2). Strains 241591A, 170382A, 261312A, 349818A, 171819A, and 111216B were found to be susceptible to all drugs tested. After performing an E-test strip test, one isolate was defined as MRSA. In order to affirm this classification of MRSA, there had to be an area of clearance within the lawn of bacterial growth at 4.0μg/mL or higher. As shown in Figure 5, strain 170382B had an E-test strip reading of 128μg/mL, confirming it is indeed MRSA. Of the total sample size, 4% were considered MRSA. Finding 50% *S. aureus* and 4% MRSA from a population presents a major problem. The prevalence of natural colonization of *S. aureus* is clearly on the rise, based on previous statistics, and this virulent pathogen can cause many diseases within the human population.

Hemolysis Patterns for *S. aureus* Strains

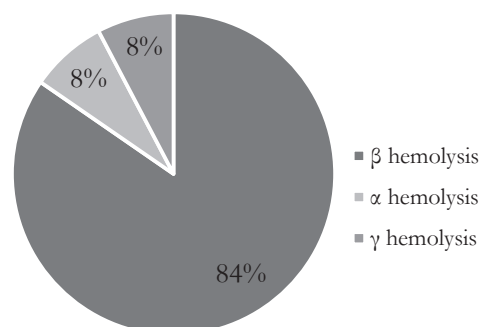


Figure 4. Hemolysis patterns for suspected *S. aureus* strains

| Strain Number | Oxacillin | Rifampin | Vancomycin | Linezolid | Clindamycin | Doxycycline |
|---------------|-----------|----------|------------|-----------|-------------|-------------|
| 241591B | S | S | S | S | I | S |
| 170382B | R | I | I | S | I | S |
| 350421A | S | S | S | S | I | S |
| 330619A | S | S | S | S | R | S |
| 402602A | S | S | S | S | I | S |
| 251411A | S | S | S | S | S | I |

Table 2. Antibiotic resistance profiles for *S. aureus* strains showing variable resistance patterns. R represents resistance, I represents intermediate resistance, and S represents susceptibility to an antibiotic.

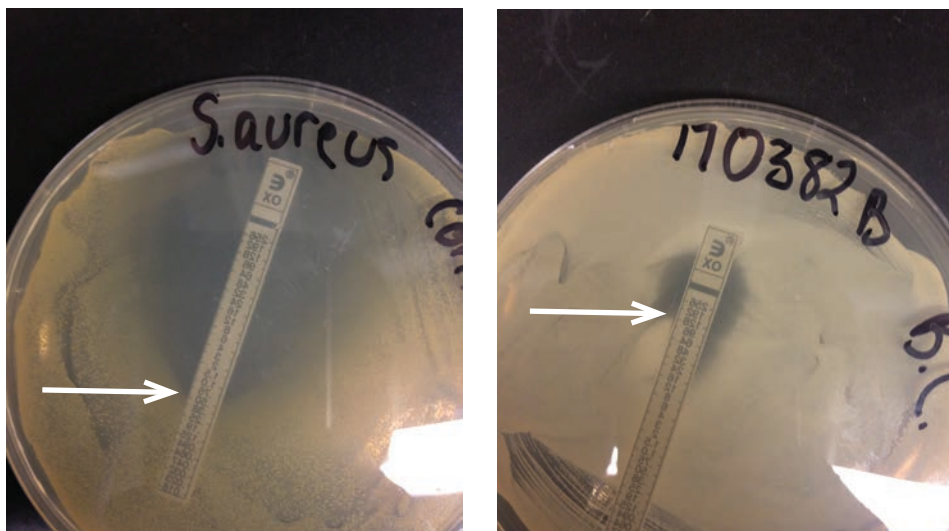


Figure 5. E-test strip results for a *S. aureus* control sample and strain 170382B. Zone of inhibition for the control sample was at 0.50µg/mL (pictured left). Zone of inhibition for strain 170382B was at 128µg/mL (pictured right).

Discussion

Based on the findings of this experiment, it is clear that *Staphylococcus aureus* is present in healthy individuals. From the 36 samples collected in spring of 2013, 11 of them were positive for *Staphylococcus aureus* (31%) but none were determined to be MRSA. This number is consistent with the statistic that about 30% of the population are carriers for *S. aureus*.¹ We are not surprised that none of our strains were considered to be MRSA considering only 2% of the general population are carriers of MRSA. It was determined that *S. aureus* colonized 50% of our sample size in fall of 2013, and 4% were said to have MRSA. These statistics are greatly increased from the fall trial and from numbers previously published, declaring 30% of their sample size was *S. aureus* and 0.2-7% MRSA.^{1,6} In previous studies conducted in 2011, 2% of the sample size were infected with MRSA. Only three years later, the number of people infected in this study had already increased to 4%.^{1,7} Our results are consistent with the increase in *S. aureus* becoming part of the normal flora.

An interesting contradiction arose when comparing CHROMagar II results with antibiotic resistance to oxacillin E-test strips. Of the 18 strains from the spring of 2013, 14 were positive for MRSA on CHROMagar; however, none of the 18 strains were positively identified as MRSA when subjected to antibiotic resistance testing. This brings about the question as to why these strains would produce a positive CHROMagar result, a test commonly used to classify MRSA, yet not technically be characterized as MRSA when subjected to

antibiotic resistance. At first we thought it might relate to the virulence of the bacteria. However, there was no consistent pattern when looking at the hemolysis patterns of the strains that tested positive on CHROMagar. In addition, antibiotic resistance testing also showed no obvious pattern when compared to CHROMagar results.

Unfortunately, CHROMagar II is patented, and we are unable to obtain information on exactly how the agar classifies bacteria as MRSA. We would like to suggest future research into the mechanism that CHROMagar is targeting in order to understand why these strains produce a false positive. Nonetheless, it is important to note that these strains, although not being MRSA, clearly show some common characteristic with the resistant bacteria if it is providing such readings on the CHROMagar. They could still have potentially harmful effects on humans. Since hemolysis is the ability of bacteria to lyse red blood cells and is therefore an indicator of virulence, it is important to note that there were naturally occurring strains of potentially harmful *S. aureus*. If these bacteria are resistant to common antibiotics they could also cause infections that people may struggle to eliminate from their bodies.

It was difficult to determine if the isolated strains were HA- or CA-MRSA based on our results. None of the strains from the spring of 2013 were considered to be MRSA and therefore would not qualify as either. However, due to the fact HA-MRSA is commonly resistant to clindamycin and CA-MRSA is susceptible to a wider range of antibiotics, it is reasonable to suggest our

isolated MRSA and *S. aureus* strains were more closely related to HA-MRSA.

The small sample size could be a potential reason for the lack of clear patterns in the results obtained. It is possible that a larger sample size would allow for patterns among hemolysis, CHROMagar results, and antibiotic resistance to surface. However, one important theme that these results point to is the diverse variation in characteristics of bacteria, even in such a small population.

Regardless of the fact that only one of our collected samples was positive for MRSA, it is still noteworthy that some of the strains demonstrated both virulent properties and antibiotic resistance. These samples were collected from a population of students who plan to enter the medical field and will be in direct contact with patients. It is crucial that these students learn the proper techniques to prevent the spread of such microorganisms to patients, especially in a medical setting where immune systems may be compromised.

If *S. aureus* and MRSA infections are truly on the rise, then new techniques and policies may need to be put in place within areas such as hospitals and nursing homes in order to protect the patients. These bacteria can be spread easily from healthcare professional to patient and vice versa. This mode of transmission is very common due to the fact that *S. aureus* is often carried on one's skin and can enter a host via any open wounds, mucosal membranes, skin lesions, and other similar sites. Individuals residing in hospitals, nursing homes, or other healthcare facilities are much more likely to have these open wounds and lesions that allow for easy transmission. With this in mind, all healthcare professionals may need to have prior screening for these bacteria before working with patients. If the healthcare worker were indeed colonized with such bacteria, they would be able to take the proper precautionary steps when working with patients. This method could prevent the spread of infection before it has the potential to harm the patient.

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The end of the “New Great Game”: China’s economic rise in Central Asia and its implications for the U.S. and Russia

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Abstract

After the collapse of the Soviet Union, in particular after the September 11, 2001 terrorist attacks, scholars began to assert the notion of a competition for influence in Central Asia between Russia, China, and the United States similar to the “Great Game” played between Imperial Russia and Great Britain in the 19th century. This paper explores the “New Great Game” between Russia, China, and the United States and argues that China is the current victor in this game. Unlike the original power plays of the Russian and British empires that centered on imperial zero-sum competition, this competition is economically driven by a search for energy resources and underscores the new mode of competition in our integrated economies. Ultimately, in light of modern globalization trends of economic and political integration, China’s new power and investment in Central Asia should be a welcome development, as it will likely stabilize the region and continue to incite favorable economic growth.

Introduction

On May 31, 2014, Chinese officials announced the creation of Line C of the Central Asia-to-China pipeline. Spanning 1,830 kilometers, the Line C conduit transverse central Uzbekistan and southern Kazakhstan en route to the Xinjiang region in northwestern China. With the creation of the third Central Asian-Chinese pipeline since 2009, China is expected to receive 55 billion cubic meters of gas transports from Central Asia each year, making it the largest importer of Central Asian gas in the world.¹ With these new investment projects, the effects of economic integration and globalization are taking root and promoting growth.

After the collapse of the Soviet Union, scholars exploring Central Asian political and economic development latched onto the notion of a “New Great Game” playing out in Central Asia.² The original “Great Game” that played out between the Russian and British empires in Central Asia during the 19th century was a contest of imperial strength and was guided by Britain’s interests in India and Russia’s aims to assert their political prestige. Today, scholars argue that the competition between Russia, China, and the United States in the post-Soviet era is similar to the zero-sum competition between the British and Russian empires in the 19th century – a contest of imperial influence that brought some peace as well as political equilibrium to the region.³ While some assert that a “New Great Game” is still active in the

region, China’s current economic dominance suggests that China has the upper hand in this game of checks and balances. Nevertheless, despite Chinese dominance, the transnational integration derived from Chinese investment highlight the positive influences of globalism in the region.

This paper explores the “New Great Game” between Russia, China, and the United States as well as the implications of China’s rising influence in the Central Asian region. Increased globalization and economic development derived from China’s new economic role in Central Asia indicate that this game should not be viewed through a classical realist zero-sum lens; rather, U.S. officials should welcome China’s newfound political power in Central Asia as a positive development and should pursue non-zero-sum outcomes in future economic and political agreements. Ultimately, unlike the 19th century “Great Game” of competition, the modern forces of globalism and integration will stabilize the region and promote economic development favorable to China, the United States, and Central Asian states.

A Brief History of Central Asia

The region of Central Asia – a vast land area bordering Russia to the north, China to the east, and the Middle East to the west, which for the purposes of this paper includes Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan – links the East to the West. Because it sits between

Europe and Asia, Central Asia is considered a strategic location and has been fought over many times, becoming a source of tension between Western and Eastern powers. When the Silk Road was in use over 1,000 years ago, Central Asia was the economic and geopolitical center of the world, connecting China and India to the Middle East and Europe through vast trade routes.

Even though the economic centers of the world shifted westward toward Europe in the early modern era of history, Central Asia continued to be the subject of imperial hegemonic ambitions and lucrative economic ventures among Western powers.⁴ During the height of imperialism in the late 19th century, Russia and Great Britain competed for supremacy in Central Asia in what Captain Arthur Conolly dubbed “the Great Game.”⁵ While Great Britain was interested in the region because of its proximity to imperial India, Russia simply wanted to acquire more land and people. When the Soviet Union formed in 1917, Central Asia remained under Moscow’s banner of socialism.

Since the collapse of the Soviet Union in 1991, the geopolitical plates have shifted away from Russian hegemony toward multilateral competition for economic and political influence in Central Asia. Instead of Soviet authority, the multifaceted influences of globalism now play a critical role in Central Asian economics, politics, and society. Central Asia has become a prime focus for leaders in Russia, China, and the United States for a number of reasons: the wealth of

natural resources in the region; the increasing demands for energy in China and throughout the world; the overall aim to diversify energy holdings away from the volatile Middle East; and rising security concerns given the ascent of Islamic extremism, Iranian aggression, and the war in Afghanistan. Together, the interests of Russia, China, and the United States are shifting the economic and political fabric of Central Asia through both military influence and trade.

Amid this backdrop of political and economic competition, Central Asia rose in the post-9/11 world to be the center of a tug-of-war.⁶ Political ambitions, economic aspirations, and security concerns collided in this new competition between Russia, the United States, and China, and state-level analysis illuminates the respective political agendas that shaped regional policies and maneuvers.

The “New Great Game” and its players: Defining the “New Great Game”

In the original “Great Game,” the Russian Tsar’s appetite for the appropriation of large territories across the Caucasus and Central Asian region, posed a threat to Great Britain’s northern entry points in India, access to the Indian Ocean, and colonial stability.⁷ In response, London generated initiatives to counteract Russian influence by contesting frontier disputes, wooing local leaders, and deploying intelligence agents.⁸ There was a zero-sum approach on both sides; any gain by Russia would come at Britain’s expense, and vice versa.⁹ Aside from defining competition between Russia and Britain for many years, the Great Game also influenced a shift in geopolitics. In 1904, British geographer Harold Mackinder commented that Central Asia was “the pivot region of the world’s politics.”¹⁰ Oddly, or perhaps predictably, the zero-sum approach from more than a century ago morphed into a permanent default description for international competition in the region.¹¹ Today, however, the balance of world power has perceptibly altered. The national players are different and their agendas are more arcane and nuanced.

Today, scholars such as Nick Megoran and Matthew Edwards have labeled Central Asia as the “heartland” of geopolitics.¹² Instead of revolving around power struggles between the two original powers, the British and Russian empires, the “New Great Game” features new players—Russia, the United States, and China, and also vital participants such as India, Iran, Turkey, and the European Union. Also, departing from the hard power considerations of the 19th century, today’s competition is a vast tapestry of political, economic, and

security considerations. Twenty-first century globalization—marked by sovereign nations, transnational organizations, international trade, rising energy concerns, and urbanization—integrates within this modern-day “heartland”. The participants are nation-states, not empires, and must respond to challenges with complex considerations that include both state and non-state actors.¹³ It remains to be seen how these non-zero-sum solutions will impact the overall global geopolitical power map; however, this game, given its multipolar considerations and opportunities for cooperation, is certainly a far cry from the zero-sum power struggles of the 19th century.

The “New Great Game” and its players: Russia

Russian leadership among the Central Asian republics has a long history. Formal imperial control over the territory began in the early 19th century and endured through the era of revolution and the rise of communism. Unified under the single Soviet domain, the Central Asian territories and Russia shared a common political and economic space throughout the 20th century.

After the collapse of the Soviet Union, the shared history between Russia and the Central Asian republics ensured a close relationship between the newly independent republics and “mother” Russia. For example, the industrial enterprises that had been closely integrated in the Soviet economic system meant that the Central Asian republics tended to send their gas and oil extracts to Russian refineries.¹⁴ Moreover, ownership of newly privatized oil companies was granted at undervalued rates to Russian nationals, further solidifying Russian control. More Russian overlap with the region came from the sheer number of ethnic Russians residing within the Central Asian states. Ethnic Russians made up almost half of Kazakhstan’s population in its early years of independence.¹⁵ Central Asia also depended on Russia for security because of a lack of security technology and trained military personnel.¹⁶

This is not to suggest that in the post-Soviet political vacuum, the relationship was a one-sided Central Asian dependence on Russian support. Dmitry Trofimov, a leading Russian specialist on Central Asia, described Russian national interests in Central Asia in five points: 1) stability; 2) unconstrained transit across the region in order to maintain partnerships with China, India, and Iran; 3) the maintenance of a common economic space with Central Asia; 4) military use of the region’s strategic geography to preserve Russia’s world and regional power; and 5) international perception as the regional

hegemon.¹⁷ Not only do these objectives demonstrate Russia’s desire for favorable ties to the region for economic and political partnerships, but they also convey the Russian impulse to maintain a firm grasp of power in the area and to uphold their old Soviet leadership in the post-Soviet era. Additionally, Moscow became the guarantor for the bankrupt Central Asian states because other world powers such as the United States were too short-sighted to engage in Central Asia’s long-term development.

Russia became an economic and political leader in the region and guided the ex-Soviet states—with the exception of the Baltic States—in the development of regional organizations such as the Commonwealth of Independent States, the Collective Security Treaty Organization (CSTO), and Eurasian Economic Association (EEA).¹⁸ Many scholars assert that these institutions were thinly disguised initiatives to promote Russian economic and political hegemony among its previous constituents.¹⁹ Leszek Buszynski asserts “Russia...pushed Kazakhstan, Kyrgyzstan, and Tajikistan into closer security cooperation.”²⁰ After 2000, Vladimir Putin worked to augment influence by redefining the Central Asian states as Russian protectorates.²¹ Despite Putin’s attempts to promote globalism through transnational economic and political organizations, Russian interests in regional power kept many of the Central Asian states wary of integration under Russia’s umbrella.

One regional organization holds a unique position in Russia’s “New Great Game” strategy: the Shanghai Cooperation Organization (SCO). This transnational organization, founded in 2001 between Russia, China, and the Central Asian states, began as a way to open trade relations between member states and resist the influence of the United States in the region.²² The SCO seemed to be a forum for Russia to extend their influence into Central Asia while quelling suspicions about their ulterior motivations. While the SCO appealed to Russia’s desire to mitigate American influence, rising Chinese authority, evident particularly through China’s economic investments in the region, presented problems for Russian power considerations. Russian Eurasianists wanted Russia to be the dominant power in Eurasia, but Russia’s influence was waning with the rise of Chinese politicians and businesses.²³ Nevertheless, Russian membership in the SCO remained an essential foreign policy tactic; withdrawing would potentially lead to a unilateral trade partnership between China and the Central Asian states. Membership in the SCO seems to have derived from pragmatic power considerations, allowing Russian policymakers to maintain some

power in Eurasia.

In the past, Russia attempted to partner with China to generate pipeline projects that would further deepen Russia's control on gas production. China's need for energy and Russia's vast wealth of energy supplies made the two obvious partners; however, relations between the two have been tense due to both states' quest for regional and global prominence. Thus, many times, discussions failed to produce energy agreements, and China turned to Central Asia. In the early 2000s, all of the existing pipelines from Central Asia ran through Russia, thereby giving Russia complete control of Central Asian gas production.²⁵ Moreover, Central Asia relied on Russia to be a market for its exports.²⁶ Thus, Russia had significant influence on gas prices for its buyers—mainly European Union states—and placed serious constraints on the Central Asian states' capacity to negotiate and compete in the energy market. China and Russia attempted to collaborate on energy agreements. China was interested in diversifying its gas imports away from the unstable Middle East, while Russia had clear interest in diversifying their export market to include countries outside the EU.²⁷ Nevertheless, these negotiations produced no results due to divided views on the pricing of the gas. The Chinese National Petroleum Company (CNPC) refused to pay internationally competitive prices for natural gas. They insisted on paying for Gazprom gas at a price comparable to China's low domestic coal prices. Gazprom – Russia's largest gas extractor that is partially owned by the Russian government – wanted the CNPC to pay natural gas prices equal to prices paid by its European clients.²⁸

Due to these failures, the Chinese turned to direct bilateral negotiations with Kazakhstan and Turkmenistan. The resultant pipeline projects pose economic and political threat to Russia. For example, the Kremlin fears that energy trade between Turkmenistan and China could undermine Russia's energy pledges to Europe by redirecting gas to China.²⁹ The expanding energy market both in Central Asia and in other areas around the world support an increasingly competitive energy market, and Europe may turn to other energy options.³⁰ This would likely encourage deeper economic exchange and further integrate Central Asia into the international market, a situation that would likely incite further investment in the region and modernize their economy. Moreover, as the Central Asian states continue to welcome China's economic presence in the region, Russia's political influence is slowly diminishing.³¹ Central Asian leaders have a long-held "hypersensitivity" to any Russian attempts to minimize Central Asian

sovereignty and have welcomed Chinese political balances.³² Thus, bilateral relations between Russia and China, while publicly supported and upheld, are slowly cultivating a relationship of mistrust.

The "New Great Game" and its players: United States

After a period of minimal involvement in the Central Asian region, the United States rapidly increased its participation in and commitment to the region in the aftermath of the 9/11 terrorist attacks and the beginning of the war in Afghanistan. Prior to September 11, 2001, investment in Central Asia remained low. While the Bush 43 and Clinton administrations outwardly stressed the importance of diversifying U.S. energy exports to the Central Asian region, the resulting trade deals were nominal.³³ Moreover, the rhetoric of support for "independence, sovereignty, and stability" in the region was not matched by monetary support or political involvement.³⁴ Indeed, while Uzbekistan's President Islam Karimov concluded a defense cooperation agreement with Washington in October 1995, this agreement did little to link the nations in developmental aid or political collaboration.³⁵ During this time, the United States was largely indifferent to the development of the Shanghai Five, a regional trade organization.³⁶ The U.S. focused its Central Asian diplomacy on bilateral agreements, encouraging economic liberalization and democratization.³⁷ George Bush followed similar diplomatic parameters during the first months of his presidency; however, in the aftermath of the 9/11 terrorist attacks, the region of Central Asia became an area of serious strategic interest.

Due to its proximity to Afghanistan, Central Asia received significant attention from the United States and became the location of strategic military bases and security partnerships for more than a decade after the 9/11 attacks. During this decade, concerns over the war in Afghanistan dominated U.S. policy regarding Central Asian states. American officials negotiated the creation of two military bases in the region before the end of 2001: the Manas military base in Kyrgyzstan and the Karshi-Khanabad military base in Uzbekistan.³⁸ The United States also supported the creation of a new oil pipeline from Baku, Azerbaijan to Ceyhan, Turkey, highlighting the American desire to diversify Europe's gas resources and diminish the Russian stranglehold.³⁹ While the War on Terror was the impetus for U.S. involvement in Central Asia, economic concerns regarding energy resources continue to shape Washington's policy in the

region.

These policies contradicted the United States' professed support for liberty, free markets, human rights, and democratization. American policies during the past decade have followed a pragmatic cooperation effort intended to maintain favorable conditions for troops in the area.⁴⁰ The U.S. has been criticized for its policies that have enabled the continuation of oppressive regimes and corruption and for ignoring its professed values of human rights, liberty, and democracy for the sake of its military agenda.⁴¹ Even though the United States withdrew from Karshi-Khanabad in 2005, the U.S. has not pushed for reforms due to its underlying need for allies in the area amidst instability in the Middle East. Jeffrey Mankoff, a scholar at the Center for Strategic and International Studies, argues, "Washington's willingness [to cooperate with corruption] made the US complicit in the corruption that threatens Central Asia from within, while making clear that Central Asia's governments have significant leverage over US actions in the region."⁴² By complying with the regional regime dynamics, the United States guaranteed favorable short-term outcomes; however, the long-term effects of these policies threaten to further upset the region's stability.

With increased American on-the-ground presence in Central Asia, Russian and Chinese officials gradually became less supportive and more suspicious. Initially, the War on Terror united the US, Central Asia, Russia, and China because of their shared interest in combating terrorist organizations influenced by radical Islam.⁴³ As the US initiatives expanded to include economic initiatives, particularly in the energy market, the SCO constituents began to perceive political and economic threats.⁴⁴ The Russian government felt threatened, took measures to counteract the effects of American commitments, and began to search for military bases in the region.⁴⁵ Despite outward signs of support for American military objectives in the war against Al-Qaeda, Russia sought to limit American influence in Central Asia by manipulating the SCO – encouraging constituents to call upon the US to remove its military bases – and fueling Central Asian leaders' discomfort with the intensifying US presence.⁴⁶ Similarly, China considered the American military presence in Kyrgyzstan and Uzbekistan an attempt to augment American influence in the region at the expense of Russia, Iran, and China itself.⁴⁷ While they subscribed to the American desire to fight terrorism and promote stability, they felt threatened by the US's presence in the region and worked to balance their geopolitical and geo-economic

interests in the area.⁴⁸

Today, aside from the obvious political interests in the region, Washington vies to maintain its economic interests in the regions energy supplies. Due to the developing partnership between India and the United States – an alliance that US strategists argue is meant to balance China – Washington is an advocate for the Turkmenistan-Afghanistan-Pakistan-India (TAPI) pipeline and other trade relations.⁴⁹ The TAPI pipeline will connect Afghanistan and Central Asia to South Asia through trade relations and energy pipelines. This pipeline is an integral component in U.S. Central Asian strategy, as it has the capacity to limit Iranian gas exports, boost Afghanistan's economy, and increase Afghanistan, Pakistan, and India's energy security. The US views the project as a major harbinger of stability.⁵⁰ This initiative, along with other economic initiatives such as infrastructure investments and business development investments, is meant to reestablish economic solvency in the greater Central Asian region, promote stability in the region and in places such as Afghanistan, and bolster US influence on the Asian continent.⁵¹ The US has a marked interest in maintaining favorable trade relationships in the region as a means of bolstering political alliances in Asia, securing energy interests, and maintaining political stability.

Currently, leaders from within and without Central Asia are anticipating President Barack Obama's drawdown in the Middle East. Central Asian elites fear the US departure from the region will result in increased security threats and diminished national sovereignty vis-à-vis China and Russia.⁵² Many scholars and leaders fear that the combination of Central Asia's Islamic extremists, energy insecurity due to the precarious situation in the Middle East, and corrupt government and trade practices within the area will further destabilize the region and threaten US security. For example, poor governance and failed development policies could lead to the empowerment of the same jihadist ideologies that the US fought in Afghanistan.⁵³ Moreover, the greater geopolitical competition between China and Russia for economic and political influence could blind policymakers to the fragility of the interstate political and economic circumstances and thereby launch the region into further chaos.⁵⁴ This political destabilization would threaten American security against Islamic extremists and could also add to energy market insecurity. Given this potential threat, increased globalization of the Central Asian energy market due to China's investment should be seen by the United States as a positive development.

The "New Great Game" and its players: China

China's shared border with Central Asia has long placed it in trade partnerships and social interactions with Turkmens, Tajiks, Uzbeks, Kyrgyz, Kazakhs and other regional tribes. These relationships began over 2,000 years ago.⁵⁵ China began exploring Central Asia around 130 BCE during the rule of the Han Dynasty. After the defeat of Xiongnu, the Chinese army established itself in Central Asia and extended the Silk Road trade route. The Silk Road facilitated communication, trade, and political and cultural recognition across China, Europe, Central Asia, India, and the Middle East. Overall, the extension of the Silk Road enabled the spread of ideas, technologies, and goods across empires.

Despite its longtime historical and cultural relationship with Central Asia, China's involvement in the region was curtailed when Tsarist Russia absorbed Central Asia into its empire.⁵⁶ During the time of the Soviet Union, China was both a competitor and a comrade to the Soviets. Initially the two communist empires were united in their socialist ideologies. As the Soviet Union drew farther and farther away from original Marxist tenets, Chinese leadership became an estranged neighbor of the Soviet Union. This strained relationship further distanced Beijing from its Western neighbors and limited trade.

While modern trade routes are far different from the original routes extending from China to the Mediterranean, China has reemerged as a critical partner in Central Asian trade. Moreover, tides of globalization and modernization have ensured integration across vast geological and political terrains through technological and economic networks. After the collapse of the Soviet Union in 1991, China pursued largely bilateral relations with the newly independent states. During this period, China was mostly engaged in negotiations regarding common boundaries with Russia, Kazakhstan, Kyrgyzstan, and Tajikistan.⁵⁷ It was not until 1996 that China was able to hold a conference with these four countries that brought together their shared interests in multilateral discussions. At this first "Shanghai Five" meeting, representatives discussed the creation of a mechanism to promote regional security, and they reached an agreement on notification protocol between the constituents.⁵⁸ Concerns about security continued to dominate the discussions in the early years of the organization. Representatives from Uzbekistan began to attend the conferences when Uzbekistan began to mistrust Russian authority.⁵⁹ The Shanghai Five officially transformed into the aforementioned

Shanghai Cooperation Organization (SCO) when on June 15, 2001, Uzbekistan became a full member.⁶⁰ Uzbekistan's suspicions about Russian political muscle-flexing were quelled by China's powerful presence in the organization.⁶¹ Thus, contradicting the espoused pretense of multilateralism and collaboration, the SCO was created through the self-interest of member states hoping to balance against other regional powers.

Many Western critics of the SCO have called the organization a "club of authoritarians."⁶² This criticism is not unfounded considering that the central goal of these six nations has been to contain potential uprisings and limit Western democratization efforts.⁶³ Moreover, China and Russia seemed to value political expediency over ideology; China and Russia each pursued a pragmatic, self-interested agenda to magnify their respective national interests with little regard for their common ideology. Russia envisioned the SCO as a security and military organization, a vision that underscores Russia's political ambitions in Central Asia and desire to uphold existing power structures in the region.⁶⁴ In contrast, China desired to use the SCO as a platform for trade and economic cooperation.⁶⁵ This economic platform was clearly intended to extend Chinese influence, bolster Chinese power in the area through economic means, and secure resources to preserve Chinese security. The divergence of China and Russia's objectives within the SCO highlights the early stages of competition between the two powers, underscoring the reality that China and Russia's outward demonstration of unity was, in reality, a façade to mask strained power dynamics.

While the SCO was certainly an early indicator of Chinese interest and investment in Central Asia, the emergence of China as a global economic superpower had a significant impact on the "New Great Game." Central Asia, originally a region under Moscow's heavy hand, is now a region dominated by Chinese investment. While several political and economic realities influence Chinese trade patterns, China's primary motivation is access to raw materials. In a presentation on the potential "New Silk Road" reconnecting Central Asia to global markets, former National Security Advisor Lieutenant General Brent Scowcroft asserted that "what is really driving this [rise in involvement in Central Asia]...for the Chinese it is raw materials."⁶⁶ In the past, China derived the majority of its energy from domestic coal production. Nevertheless, the 10 percent per year growth rate, along with accelerated industrialization and shifting urban demographics, gave rise to massive increases in energy demands. This increase compelled

China to obtain energy from overseas. In November 2010, the International Energy Agency (IEA) reported that Chinese oil demand surpassed 10 million barrels a day and required the importation of 4.8 million barrels a day of crude energy.⁶⁷

Fearful that a failure to satisfy the energy demands of the nation will lead to civil unrest, China has wholeheartedly entered the Central Asian market, using its economic clout to generate favorable pipeline projects and energy deals. The majority of China's interest in Central Asia's energy supply is focused on both hydrocarbons and electricity generation.⁶⁸ They have invested heavily in creating pipelines that directly supply China with gas from the region. Chinese analyst Qiang Xiaoyun views the SCO as a crucial contributor to the multilateral pipeline agreements. Moreover, he asserts that the gas pipeline is a mutually beneficial solution in which Central Asian economies benefit and China can meet rising energy demands.⁶⁹ In the middle of the economic recession, Beijing demonstrated its long-term interests in Central Asia by extending large official loans to the Central Asian states. Ultimately, these favorable aid partnerships secured China's future access to hydrocarbon exports from the region.⁷⁰ In December 2009, the first of the three Central-Asia-China gas pipelines was completed, making it the first major gas pipeline completed since the collapse of the Soviet Union to completely bypass Russian territory and the Gazprom-Transneft network – the state-owned pipeline network that is the largest energy transport company in the world. While Russian officials received this partnership with a calculated air of nonchalance, there is a burgeoning tension as China's enters into an arena previously dominated by Russia.⁷¹

China's investment is likely driven by natural resource demands, but there are other significant political considerations. Zbigniew Brzezinski, former US National Security Advisor and Secretary of State, asserted that China is beginning to look westward to extend its political influence on the Asian continent. Today, despite China's increased claims over the South China Sea, the United States' mutual protection promises are a significant deterrent from extension. Power moves eastward are difficult given the close friendships between the United States and Pacific states such as Japan and South Korea. Thus, Chinese political power is best directed toward its Western neighbors.⁷² Overall, the Chinese propulsion to assert dominance on the Asian continent is a signal of Beijing's increasing urge to become not only an economic superpower, but also a political superpower. Chinese investment in Central Asia utilizes economic muscle in order to

gain both economic and political benefits.

China's Rise in Central Asia

While Russia and the United States certainly continue to have economic, political, and security stakes in Central Asia, the "New Great Game" is effectively over in light of rising Chinese involvement and the tides of globalization. In recent years, Central Asian trade with China has grown at more than 20 percent per year, and is now the region's largest trade and investment partner.⁷³ Rather than bolster regional connections to Russian and American partners in South Asia and the EU, Central Asia is pursuing ambitious infrastructure projects with Beijing, including plans for railroad, highway, and electrical infrastructure.⁷⁴ In 2009, China loaned \$10 billion to Kazakhstan and invested hundreds of millions of dollars in various construction projects in Ashgabat and Bishkek.⁷⁵ China has regularly conducted military exercises in the region, to enhance regional security and assert its commitment to the region. Such initiatives and investment strategies promote four key Chinese objectives: 1) access to energy resources; 2) diversification and reduction of dependency on hydrocarbon from volatile areas; 3) the creation of a new market for Chinese goods; and 4) heightened political and military presence on the Asian continent.

China's willingness to invest in Central Asia highlights an overall strategy for augmenting political and economic clout throughout Asia. China's interests have

expanded from natural resources to include energy security, border security, geopolitics, and combatting extremist, terrorist, and other separatist forces.⁷⁶ The bilateral relationship between Kazakhstan and China holds the largest trade value among all of China's partnerships in the region, totaling \$25 billion in 2012.⁷⁷ China has obtained a leading role in cultivating and developing the Kazakh energy industry, and this influence has not only secured China's leadership in the country, but has also drastically increased the economic solvency of Kazakhstan.

Similar patterns of Chinese investment promoting domestic economic development occurred in Turkmenistan (2012 trade totaling \$10.4 billion), Kyrgyzstan (2012 trade totaling \$5.2 billion), Uzbekistan (2012 trade totaling \$2.9 billion), and Tajikistan (2012 trade totaling \$1.9 billion).⁷⁸ In Turkmenistan, China has extended its influence beyond the economy and has worked to develop political initiatives as well. In August 2009, Chinese and Turkmen officials established the Intergovernmental Cooperation Committee with subcommittees that focus on economy, trade, energy, humanities, and security.⁷⁹ In Kyrgyzstan, Chinese investment ranges from railway initiatives to power lines.⁸⁰ Similarly, an Intergovernmental Cooperation Commission between China and Uzbekistan was signed into existence in October 2011.⁸¹ Tajikistan shares a border with the Xinjiang region of China and signed an agreement on May 20, 2013 to improve bilateral cooperation.⁸² Tajikistan also received

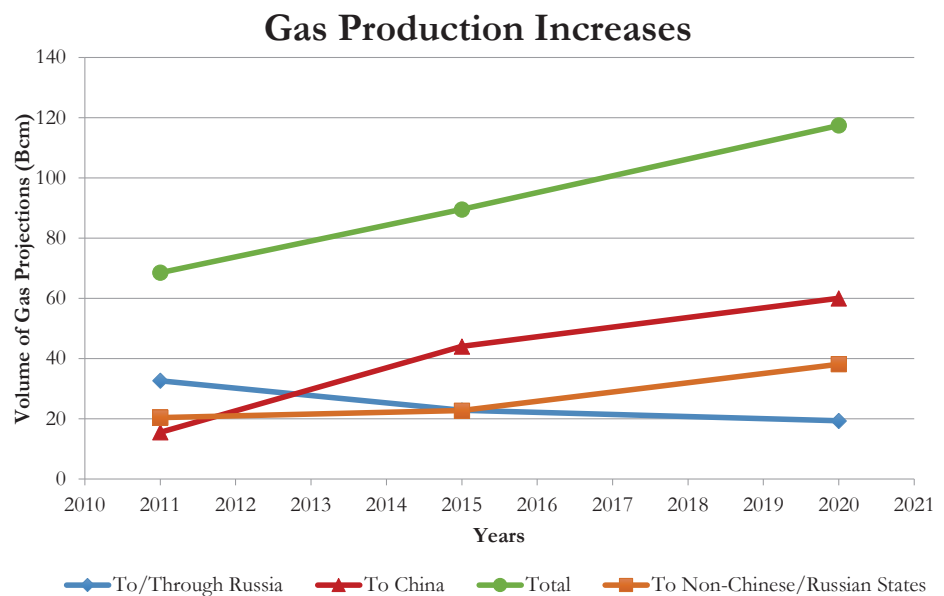


Figure 1. Predictions through 2020 of Central Asia's total gas production volumes and their destinations (adapted)⁸⁴

approximately \$1 billion from China in June 2012.⁸³ The long-term impact of Chinese-Central Asian political and economic coordination underscores the reality that China has the upper hand in regional diplomatic and financial spheres.

As Figure 1 indicates, Simon Pirani projects that Central Asia's total gas production will steadily increase from 68.5 billion cubic meters (Bcm) in 2011 to 117.4 Bcm in 2020. Similarly, the volume of gas exchanged with China is projected the leap from 15.5 Bcm in 2011 to 60 Bcm by 2020. Meanwhile, the volumes of exchange directed toward Russia will likely decrease from 32.6 Bcm in 2011 to 19.3 Bcm over the same period. Although the United States does not benefit significantly from Central Asia's natural gas exports, it is invested in the region for its strategic purposes and to ensure energy access for its allies in South Asia, East Asia, and Europe. As the projected gas trade volumes suggests, the Russian energy monopoly in Central Asia is quickly waning. The increases in gas production, while mostly directed toward China, are also positively impacting energy markets in non-Russian or Chinese regions (in particular, the EU, Turkey, and India). Figure 1 shows a steady increase in volumes of Central Asian energy funneling toward these regions, suggesting that Chinese energy production projects will have a positive impact on the diversification of energy resources for American allies.

As more and more Central Asian gas is directed toward China, Central Asian states will earn income and attract investments that will help modernize the region's infrastructure. Jeffrey Mankoff argues that "these roads, railways, and pipelines all underpin China's growing economic and cultural presence in the region, and they are likely to have a more enduring impact on Central Asia's long-term development than either the war in Afghanistan or Russia's push for regional integration."⁸⁵ Meanwhile, Russia is scrambling to reassert its political dominance in the region. Putin is attempting to contain the region in a way similar to the Soviet past.⁸⁶ For example, Putin's propensity to create economic unions demonstrates the impulse to reassert Russia's regional hegemony.⁸⁷ Nevertheless, the pipeline and other economic development initiatives have provided Central Asian states with non-Russian export routes, boosting their power in both natural gas price negotiations and general political discussions with Russia.⁸⁸ With China's strong bilateral relationships with Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan, Russia's economic and political agendas are becoming less attainable goals.

The United States, in contrast with

Russia, welcomes the Kazakh-Chinese oil ventures and the creation of the pipelines; however, officials have certain long-term concerns about accessibility to the energy markets. The pipeline projects are consistent with the US energy strategy to expand global energy supply and promote the sovereignty and independence of the Central Asian states.⁸⁹ Indeed, the expansion of the global energy market is good for the United States in that it increases market competition, drives prices down, and promises diversified energy suppliers outside of the volatile Middle East region.⁹⁰ Despite the overall benefits of China's investment in the region, there are some analysts who attribute negative consequences to China's rapid rise. For example, given the high demand for Turkmen gas in the East, supplies for the Trans-Caspian projects, such as the long-proposed Nabucco pipeline to Europe, will be limited.⁹¹ Further concerns arise when policymakers consider America's support for the new TAPI pipeline. China may react to the initiative with competitive resentment rather than complementary support.⁹² China has drastically altered the energy map of the Asian region, and these changes have given rise to new geopolitical and economic concerns in Washington.

The current push for financial and diplomatic influence in Central Asia is fundamental to the overall American strategy to sustain leadership abroad and counterbalance China's rise. Washington is working to maintain and strengthen alliances around the world. Indeed, the Obama administration's "Pivot to Asia" was an indication of these objectives. American and Chinese relations are often tense and cautious, built on careful statecraft and negotiations. Despite the tension, Central Asian economic and political ventures appear to produce mutually beneficial outcomes for both China and the United States.

As Central Asian energy projects continue to move forward, the US will also support Chinese ventures and advocate for TAPI pipelines. As the US encourages China, Pakistan, and India to develop alternative energy transit routes, the world's energy supply will continue to diversify, diminishing Russia's monopoly on Central Asian gas.⁹³ This remains a major concern, given the fragility of Russian-Western relations and volatile oil prices. Keeping a foothold in the region and supporting China's funding and infrastructure initiatives will strengthen America's diplomatic efforts to promote democracy and market ideals in the area.⁹⁴

Conclusion

The original zero-sum competition between the Russian and British empires

was built on a foundation of power considerations, primarily demonstrated by military might and imperial stretch. Today, power in the region is derived from a much different source. Although regional military authority is still a viable commodity, China's upward trajectory past Russia's political power and the United States' military power suggests that economic power is a far more influential commodity in a region desperately seeking development. Moreover, given the transnational implications of trade, China's economic rise in Central Asia exemplifies the overarching forces of globalization that are linking nations together and integrating previously isolated states into codependent networks. Unlike political power ploys, economic power can strengthen the influence of more than one country by increasing markets, impacting trade, and encouraging development.

China's new position in Central Asia supports four key economic and political developments: 1) it introduces new technologies and infrastructure to the region that can foster future partnerships; 2) it brokers stability in a strategic and potentially threatening region; 3) it diversifies the world energy market and promotes energy security; and 4) it opens the potential for future energy ventures that will secure Washington's foothold in Asia. These projects present opportunities to broker future energy and economic deals in the area and support America's overall presence on the continent.

While there are multiple points of tangency, there are also some significant emerging regional and global issues that warrant further research. Dilemmas that require more study are the effect of the current Ukraine crisis and the effect of current energy price drops on Russia's relations with the US, China, and Central Asia. Russia's volatile relations with the West due to the Ukraine crisis led to economic sanctions and current rapid-fire inflation may result in a rotation eastward and foster further Russian-Chinese collaboration. Moreover, if the US and Russian governments become increasingly estranged, future projects may stall or remain uncompleted. A second consideration is the current plummeting of energy prices. As global oil and gas prices continue to drop at a rapid pace, further energy extraction projects may be stalled. Finally, a third consideration is the recent slow-down of the Chinese economy. While the impact of this slowdown on investment in Central Asia is still unclear, Chinese economic policies and sociopolitical plans may change. Nevertheless, despite these emerging trends in global politics, one fact remains clear: Central Asia has benefited from Chinese investment and the tides of

globalism, and is a testament to the mechanisms of international integration.

The future of Central Asian power-plays is still being determined as the centers of global power continue to shift eastward and the United States asserts its influence on a macro scale. As economic exchange and political integration continues to expand, Central Asia will develop into a hub of trade and political transnationalism that will ultimately stabilize the area. The "New Great Game" demonstrates the modernizing effects of global integration and the emergence of non-zero sum political and economic relationships. In our increasingly globalized world, Central Asia will continue to integrate with the international community, thereby promoting political dialogue, regional stability, economic development.

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Home in the garden: developing an eco-queer framework for sustainable housing design

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Abstract

Engineering is often viewed as an apolitical discipline, wherein there is no room for discourse around social and environmental justice. However, the reality is that engineering design decisions have wide-reaching social and environmental impacts, both positive and negative. This paper seeks to challenge the current political foundation of engineering and engage with bodies of social theory in order to re-conceptualize engineering as a politicized and justice-oriented discipline. Specifically, the politicized engineering practice is applied to architectural engineering and the housing design. This is due to the great influence housing has on social and ecological systems. Feminist technology studies, queer space theory, and queer ecology are used as the new political underpinnings of this engineering, with major insight coming from the dismantling of the technical/social, private/public, culture/nature, and human/technology dichotomies. By using these social theories, an 'eco-queer' framework is developed with the aim of asserting the design and use of homes as a process of social, environmental, and ecological justice. The six principles of the framework focus on situating the home, both physically and metaphysically, as a permeable and adaptable pocket positioned within an ecological community. Further, technology and nonhuman nature are conceptualized as active agent of co-creation in the design process. The main aims of the framework are to guide the design of buildings that are sustainable, inclusive, and flexible to the needs of those who move through them.

Introduction

Most engineers see themselves as both removed from, and unqualified to deal with, issues of social and environmental justice.¹ In reality, the design decisions made by engineers have immense social and environmental implications, and each choice can either further or challenge societal oppression. Unfortunately, the disingenuous framing of engineering as an apolitical discipline hides that reality and prevents serious conversation around how to make design choices that are aligned with social and environmental justice. By making sexuality, gender, race, and class irrelevant within engineering, discussions of power, privilege, oppression, and marginalization are rendered irrelevant as well.² Social theory provides the political discourses to both understand the current political underpinnings of engineering, and begin to develop a new framework through which to guide design.

One potentially significant reason for the lack of political discourse in engineering is the severe underrepresentation of marginalized communities within the discipline, with disproportionately few women, people of colour, queer people, and disabled people studying or working in engineering.^{2,3,4} With there being so few in engineering who experience various forms of oppression, it is unsurprising that oppression is not a common topic of discussion within the field. The underrepresentation of marginalized

communities within engineering in many ways allows for the current separation between the technical and the social to be maintained.

Architectural engineering is the area of particular interest when it comes to discussions of social justice and representation. Housing has vast implications for social relations and sustainability. Housing construction and use make up a significant portion of total resource consumption and 40% of total global energy consumption.⁵ They also shape the lives of the people who live in them, based on their location, size, layout, features, etc. People's identities play a large role in the way they move through and engage with spaces, so the lack of participation of marginalized people in the design of housing means that questions around use and the purposes of spaces are left unexplored. As such, architectural engineering and housing design will be the focus of this paper. The home is an important social construct, and by bringing the social theory's engagement with the metaphysical home into the practical design of housing, the potential is created for discovering new ways of conceptualizing and designing buildings.

Three strands of social theory will be woven together to guide this conceptualization of the home and housing: feminist technology studies, queer space theory, and queer ecology. Feminist

technology studies deconstruct the ways in which gender is overlain upon engineering methods and design, particularly critiquing the divide between the social and the technical. Queer space theory engages with the divide between public and private spaces, as well as the performative nature of spaces. Queer ecology, also known as eco-queer theory, disrupts the nature/culture dichotomy and fleshes out the garden metaphor as a site of co-creation between the human and the non-human. These three areas each play a critical role in answering questions of how we design, what we design, and who designs.

The motivation of this project is to find ways for engineering to take part in social, environmental, and ecological justice by recognizing and resisting the structural violence enacted upon marginalized communities, the skewed distribution of environmental resources and harm, and the degradation and exploitation of nonhuman species and ecosystems.⁶ It stems from a desire to approach engineering from a perspective of positioning humans as a species within ecological communities and understanding the interconnectedness of ecological degradation and social oppression. It also requires engaging with an intersectional understanding of oppression; intersectionality, a concept developed by black feminists, describes the ways in which one's identities, with regards to gender,

race, class, ethnicity, sexuality, (dis)ability, religion, etc., uniquely interact and shape one's experiences.⁷ Thus, there must be an understanding of how people experience multiple forms of oppression concurrently and synergistically, so that their movements through, and interactions with, spaces can be better understood and inform design.

By building upon and applying the previously mentioned social theories, this paper aims to develop a new framework for housing design. This eco-queer framework will fully recognize and engage the inherent politics of engineering; find solutions through the interconnectivity and inseparability of technology, society, and environment; and situate homes as a site for promoting social, environmental, and ecological justice. The three social theories will first be presented and explored for their potential contributions to a new political foundation for engineering. Then the framework, based on this political foundation, will be developed and its resulting principles will be presented, using examples of existing buildings and art/architectural installations to demonstrate what these principles might look like in practice.

Literature Review

Feminist technology studies

Feminist technology studies provide the bulk of the critique around engineering practice. They challenge the ways in which engineers conceptualize and navigate the design process by dismantling the technical/social dualism that shapes design, paying special attention to the ways gendered assumptions permeate design decision. It also holds engineering accountable for its close ties to militarism and Western imperialism and points to this as a barrier for the participation of those affected by war. Lastly, it brings forward the notion of the sociotechnical, a valuable tool to articulate the swirling influences of society and technology upon each other.

Technology is deeply embedded with many dualisms, including "people-focused vs. technology-focused, social vs. technical, detached objectivity vs. emotional connectedness, hard vs. soft technology, concrete vs. abstract, reductionist vs. holistic, specialist vs. heterogeneous."⁸ Despite the necessity of both in design, the two sides are not equally valued within engineering, where problems are often stripped of everything until they become purely mathematical puzzles.⁸ This imbalance in valuation leads to design becoming reductionist and removed from context. It becomes more challenging to design for particular situations and fulfill the needs of different communities when what matters from those communities is

(literally) taken out of the equation. For example, airplane seats are design based on a certain 'normal' human body size, despite the huge variety in actual body sizes that exist; there would not need to be the public debates over whether larger people should be charged for taking up two seats if engineers designed planes with varying seat sizes to account for people's varying body sizes. The focus on reductionist and standardized design leads to those who do not fit the assumed norm to not be able to access the resulting technologies as easily. Additionally, the imbalanced valuation causes the user interface, or the point in the technology where it interacts with humans, to also be devalued as 'fluffy', despite it being just as crucially important to the successful implementation of the technology as the functionality 'meat.'⁸ While the design of the functional design of the engine and wings are critical important for the successful flight of an airplane, the design of the cabin and seats are critically important for the experiences of passengers.

Despite claims of objectivity by engineers, it is not hard to find examples of engineers' biases drastically changing the technologies they design. The microwave oven was originally designed to appeal to single men; it was assumed that they would have little knowledge of, or interest in, cooking, and so microwaves were originally designed with the simple function of a timer.⁹ Additional cooking options and modes were added when the microwave was redesigned for women, who were assumed to be homemakers cooking meals for their families. These microwaves were designed to fit into their expected cooking practices.⁹ By denying that engineering is embedded within social influences, engineers fail to recognize how their own perspectives affect the technologies they design.

The influence of engineers' social positions upon the work they do should also be considered as a factor in the disregard of problems experienced by people in poverty and women, as well as the solutions found by those marginalized people.¹⁰ This is unsurprising, given that engineering has developed and continues to be guided by historical frameworks predominately driven by white, heterosexual, middle- to upper-class, cis men.¹ As such, the field by and large fails to address the needs of marginalized communities and effectively improve their livelihoods. This is in part because of an over-emphasis on Western and high-tech solutions, which make the developed solutions inaccessible to many because of the technical complexity and cost, and also diminishes local culture and autonomy by imposing standardized 'global' (read:

Western) solutions. Furthermore, historically and contemporarily, there have been strong ties between engineering and militarism.¹⁰ As more people from marginalized communities—especially those who have been directly affected by militarism and war—enter engineering, there is the potential for engineering to disengage with militarism. Engineer Aarne Vesilind published a volume on "peace engineering" and its development over the last several decades.¹⁰ He describes it as "the proactive use of engineering skills to promote a peaceful and just existence for all."¹¹ His work has focused on creating space in discussions of professional ethics to go beyond legal responsibilities and look at the moral responsibilities of engineers.¹⁰

Historian Thomas Hughes developed the notion of the sociotechnical in 1986, to reflect the idea that "technology is never 'just' technical or 'just' social," but rather is "a densely interactive seamless web."⁹ Hughes' work built upon previous rejection of two views of the relationship between technology and society. The first, technological determinism, contends that the views that technologies have singular possible paths of development and that they determine social change.⁹ The second view, technological constructivism, is that social factors drive technological development, again suggesting a singular relationship of influence.¹² The sociotechnical is a recognition of how social factors and biases shape the design, deployment, and use of technology, while conversely recognizing how the deployment of technologies reshapes social conditions and relations. Society and technology mutually influence each other in complex and inseparable ways. The sociotechnical is useful for the design of housing in recognizing how homes are not metaphysically stationary, but rather twist and turn with social realities.

Queer Space Theory

Queer space theory, which directs its inquiry towards architecture already, provides the questions of how we engage with spaces and technologies, especially on a personal level. Its first contribution is the blurring of the dichotomy between public and private space. Its second comes out of the presentation of spaces and identities as mutually reestablishing each other, underlying the fluidity of both. Lastly, it explores the ways in which design can be opened up to all to take part and shape the process and outcomes.

The concept of the public and private spheres is drawn from the feminist architecture binary of the public/outside/corporate/masculine vs. private/inside/domestic/feminine.¹³ It reflects the ways in

which certain activities or persons are seen as to 'belong' in particular spaces, such as queer affection/expressions being only appropriate 'behind bedroom doors.' To challenge this binary, a queer utopian view suggests that we view space, "not [as] one where different groups exist within separate spheres, but [as] one where space is understood and used as a collective sphere where they interact in full relationality."¹³ This means that instead of creating pockets of safety for marginalized communities, all spaces are shaped so as to be welcoming and inclusive to all. It means rejecting the current ways in which spaces are constructed for a normative white, able-bodied, heteronormative male, while expending additional effort to make those spaces open to others. To achieve this, spaces must be sufficiently flexible so that they can support any use, while also over-laying the public and private; the 'sense' of the space needs to be made elastic enough that it stretches as people pull upon it, rather than snaps and breaks.¹³

Queer space theory counters the assumption that the design of spaces can be removed from an understanding and consideration of how "an individual's self-identification (in relation to gender and sexuality, but also to age, race, and class categories) influence their use of their environment."¹³ Instead, it argues that spaces change in relation to the identities of those who inhabit and navigate it. This understanding makes space not only exist in the physical, but also in the intersubjectivity of people's relationships with the space, and with other people in that space.¹³ As such, the context of the space is defined by the identity of its inhabitants, and there's great potential for designing spaces geared towards specific communities.¹⁴ Thus, issues of gender, race, class, and sexuality must be central to the way spaces are conceptualized and designed. Currently, the imaginative potential of architectural engineering is stifled by the lack of diversity of its practitioners.

In order to address this problem, the importance of people's lived experiences must be recognized. Researcher Maria Udén explores how all people come with a multitude of experiences for common things, using the example of soil. Not only are its properties and characteristics the result of an ever-changing history that engineers must learn and engage with for construction, agriculture, etc., but all people have experienced soil.¹⁵ People know "this experience regardless of and beyond professions and education, ...we live on and by it; we know soil as that which we walk upon, ...soil to cultivate, soil as slopes that change each year with the flow of rivers and waves, ...soil sinking down and collapsing when permafrost melts and

the sea level rises."¹⁵ Finding ways to build on the unique experiences people have had with the materials and concepts can make the engineering process more accessible to marginalized communities. By creating these spaces which validate people's lived experiences and knowledge, the over-valuing of the abstract and technical is dismantled. This opens up new ways of conceptualizing and tackling problems that aren't currently considered.

When designing homes, there needs to be a flexibility and fluidity in the process and end product. The design process needs to be able to accommodate the participation of diverse groups and ensure that unexpected and unique contributions are not swept aside as insignificant. With the designs themselves, the spaces need to be created such that people with different identities and experiences can move through them and shape them to fulfill their needs.

Queer Ecology

Queer ecology melds queer theory and eco-criticism in order to create "asexual politics that more clearly includes considerations of the natural world and its biosocial constitution, and an environmental politics that demonstrates an understanding of the ways in which sexual relations organize and influence both the material world of nature and our perceptions, experiences, and constitutions of that world."¹⁶ It too takes aim at flawed dualities, this time with regards to nature and culture. It builds from this to position humans as members of ecological communities of co-creation through the metaphor of a garden. Lastly, with discussions of cyborgs, technology is also brought in as part of these communal processes.

Engineering is tied with hegemonic masculinity, much through their shared history of association with industrial capitalism, which has long strived for control, domination, and "mastery of nature." The environment is viewed as merely a resource base that is to be managed and used wisely; human activity is seen as being outside of the environment, the two affecting each other from a certain distance. It is important to note that even as engineering strives to optimize the use of environmental materials and space, deeply engrained politics of access ensure that not all benefit equally, and that many are actually harmed.

Theorist Donna Haraway uprooted this separation with her proposal of *natureculture* in her 2003 book, *The Companion Species Manifesto: Dogs, People, and Significant Otherness*. She posits that "the very idea of nature itself is not natural; *nature is cultural*," though that is not to say that nature is subsumed within

culture (emphasis in original).¹⁷ It reminds us of the inseparable interconnections between what we perceive to be nature and culture. Researcher Catriona Sandiland further explains this through the queering of environments, describing it as the process "by which all relations to nature become de-naturalized, by which we question the uses to which 'nature' has been put" in order to create queer environments where "the boundaries between 'nature' and 'culture' are shown to be arbitrary, dialectical, mutually constitutive."¹⁸ By seeing nature and culture as deeply connected and tied together, it becomes clear how social systems of oppression and marginalization can have implications for the environment.

The garden metaphor, used often in eco-queer writings, has been used to illuminate the blurring between humans and nature and the queering of natural spaces. In some North American Indigenous cultures, as noted by Joni Adamson, gardens are seen as "the middle space," where humans and nature engage in a relationship of reciprocity and co-construction.¹⁸ In discourse around the nature/culture duality, "culture" is conceptualized to incorporate all that is human. However, 'culture' can be unpacked more by bringing in Haraway's work on cyborgs, which breaks down the divisions between humans and technology. She suggests imagining "the profusion of spaces and identities and the permeability of boundaries in the personal body and in the body politic."¹⁹ By recognizing the ways our bodies and technology are fused, in both metaphysical and, at times, literal senses, she blurs the boundaries of body and technology. Together, the cyborg garden can be seen as the space whereby technology, humans, and nature converge to participate, interact, collaborate, and create. Nature is reworked not as a passive resource, but as an active agent; technology too goes from a passive tool to an agent of change.¹⁹

Re-imagining nature as an active participant in creation throws greater weight behind the call for ecological justice, and the position of the nonhuman also having inherent moral value. However, there does not exist the same quantitative bodies of works and thought around justice/rights/value for technology. What does it mean for technology to be seen as an active agent, to have needs and moral value? What would a technological justice look like if it were to exist? It might be that engineers develop fuller relationships with the technologies they design, that they take on some level of responsibility, not just for the impact of their designs upon social and ecological systems, but to the wellbeing and upkeep of the technologies themselves. Further, the goal

of engineering to reduce risk and uncertainty may not be reconcilable with the potential loss that results from technology and nature becoming co-engineers. Or perhaps it really means approaching design with a greater level of honesty about the control engineers actually have, and accepting the tension that exists between reducing risk and the “fluidity, über-inclusivity, indeterminacy, indefinability, unknowability, the preposterous, impossibility, unthinkability, unintelligibility, meaninglessness” of queer methodologies.²⁰

It is an accepted assumption that “the main purpose of the built environment is to separate humans from natural systems by providing protection from the elements.”²¹ This is an obvious manifestation of the nature/culture duality or a conceptual barrier made physical. Instead, the home can be re-imagined and redesigned so that it provides enough protection that humans are able to live comfortably but are still connected to their ecological communities. The home’s walls cease to be impenetrable barriers and become fluid, permeable membranes; the home stops being a refuge from nature and instead becomes a part of it.

Discussion & Recommendations

The insights drawn from feminist technology studies, queer space theory, and queer ecology can be brought together to create an eco-queer framework for the housing design. Using the political foundation laid by the social theory works, principles were drawn out from them to form the framework. While the framework aims to inform the design of all homes, some principles may be particularly geared towards those within more urban/densely populated areas or for the design of space where a greater flow of people through it is expected or desired. In this section, each principle will be explained and explored, and examples of homes or installations that reflect some fulfillment of that principle are provided to give more grounding to the practical applications of them. The framework consists of the following six principles:

(i) The design process is fluid, meaningfully engaging diverse communities throughout the entire process, and relying on both experimentation and analytical methods.

(ii) Societal power imbalances and systems of oppression and marginalization are challenged through the design and use of buildings.

(iii) The design prioritizes features that have flexibility of use to ensure the accessibility of the space.

(iv) The building is embedded within the environment, going beyond zero-impact to actively supporting the local ecological

community.

(v) The building’s design and use engages technology and nature as active agents.

(vi) The local context of the building guides its design and use, and low-tech solutions are preferred over high-tech ones.

The design process is fluid, meaningfully engaging diverse communities throughout the entire process, and relying on both experimentation and analytical methods.

The first aspect of this principle is to recognize and embrace a definition of the design problem and project, which does not have clearly set boundaries, both temporally and contextually. Instead of being the “implementation of a plan for action”, the practice of sustainable design should be understood to be “an on-going transformational process in which different actor interests and struggles are located.”²² This requires a new language, as “more fluid terms are needed: dialectical, open-ended terms to characterize the ebbs and flows, nuances and subtleties and the ambiguities of environmental politics.”²³

As mentioned previously, the mapping of a gendered dichotomy onto the existing dualities present in engineering results in the sides more associated with the feminine (holistic, heterogeneous, concrete, experimental, emotional connectedness) becoming devalued, while the others, associated with masculinity (atomistic, homogeneous, abstract, analytical, objective detachment), are overly valued.⁹ All methods of approaching and solving problems need to be encouraged. Experiments and prototypes provide information that analytic methods cannot. Local contexts for design projects particularly come through these different methods, as they are often lost in reductionist analysis. Additionally, alternative media for presenting ideas must be encouraged.²⁴ Engineering needs to be opened up so that people can express themselves and provide input in ways that are best for them, whether its mathematics or art. What this does is allow designs to capture aspects that wouldn’t otherwise fit, such as the ‘feel’ of a design.

This leads to the final aspect of this principle, which is the critical role that meaningful community engagement plays in an eco-queer design. All participants in the design process have important insights and experiences that should be received and incorporated within the design.¹ In order for meaningful engagement to occur, the engineers leading the project work on addressing the barriers of participation that prevent people, particularly marginalized communities, from taking part.²⁵ The process must also be understood as a mutual

relationship of co-construction, which means taking the time to have the necessary conversations and allowing projects to potentially take longer to move forward. Those involved in the designing need to develop the rules for how they will be working together and what their engagement will look like.²⁶

Additional thought must go towards what is being asked of different community groups. Often projects expect that the more vulnerable groups will contribute more of their scarce resources (in terms of time, cost of transportation, etc.) to participate in the processes.¹⁵ However, this perpetuates oppression and marginalization by placing greater burdens on those already oppressed. Careful consideration must go towards ensuring that marginalized communities are properly compensated for their involvement so that engaging in the process is worth their effort.

An architecture installation by architect Stephanie Malka entitled “Pocket of Active Resistance”, provides a unique example of how more fluid and open design processes might be carried out. The design, shown in Figure 1, is based on parasitic architecture, whereby un(der)used spaces in existing infrastructure are used as spaces for new designs and spaces to be created within.²⁷ Malka’s proposed project would fill the interior walls of the Arche de la Défense in Paris, France, with affordable, interconnected, and colourful living modules.²⁷ The vision came out of a desire to bring attention to issues of poverty and provides one solution to it through a more chaotic, messy, yet sound design. While it is only a proposed vision, it reflects the kind of imaginative work that is necessary for challenge current oppressive systems.

Societal power imbalances and systems of oppression and marginalization are challenged through the design and use of the building.

This principle underscores the importance of understanding the role social justice has in the home design project and how the home can be used to further social justice. Addressing questions of what kinds of homes and cities should be designed cannot be removed from questions of the societal values, community structures, lifestyles, and relationships with nature that are desired.²⁴ If it is understood that the root causes of the exploitation and destruction of the environment stem from a societal narrative of domination and exploitation that drives societal systems of oppression, then only by addressing social oppression can the environmental crisis be solved.²²

The public/private duality also comes into play in this principle, with the division



Figure 1. Pocket of Active Resistance, an example of parasitic architecture, in which colourful living modules are all along the interior wall of the Arche de la Défense.²⁷

between them being blurred. The BOOM Waves, a series of planned communities for elderly LGBT people, created by Matthias Hollwich and Hollwich Kushner Architects, is an example of how the public/private line can be purposefully blurred. The homes design is based on offset adjacent concrete ribbons, with “peaks dedicated to interior spaces and troughs cupping private and communal garden.”¹³ Glass walls are used as the other two walls buildings, creating homes that can be entirely open and visible to the public, though there are full-length curtains that occupants can use to create privacy.¹⁴ The result is a “communitarian utopia where traditional family definitions dissolve through varying degrees of publicness.”¹⁴ Designing the homes to be highly public not only challenges the homophobia that relegates queerness as something that should be kept hidden, but also helps further the goal of creating a sense of community and connection amongst the residents.

A second example that reflects this principle is an apartment complex in Nishi-ku, Yokohama, Kanagawa, Japan, designed by Osamu Nishida and Erika Nakagawa.²⁸ It is an open-space artist collective, where the tenants have small private apartments on the second story, but the main floor of the building is open to the environment and the public; it’s a space for the artists to create and exhibit their works.²⁸ The four private studio apartments have doors and their own small kitchens, while the main floor is a semi-public courtyard which also has a larger kitchen space.²⁹ The courtyard area is used by the surrounding community, creating a space not only for the community to come together and build relationships but also for potential political organizing

and mobilizing.²⁹ Through this potential and use, the building’s purpose changes temporally within the context of community needs, and the space is further shaped by the artistic creations and expressions of the artists living there.

The design prioritizes features that have flexibility of use to ensure the accessibility of the space.

An important aspect of the BOOM Waves community was that those living in the homes could easily move the line between public and private as they wanted, based on their comfort levels. In the Yokohama apartments, each of the 4 units has a small kitchenette space, while the main kitchen area is in the communal space. This allows the tenants to be able to move their food preparation and eating from public to private. Allowing the users to move between the private/public line creates flexibility in the space, which makes it more accessible and livable.

The purpose of architecture is not only to satisfy human needs, but also to create spaces that allow for human growth, creativity, and life to flourish.⁵ To achieve this goal, sustainable buildings need to be seen as sociotechnical artifacts, which are constructed and reconstructed in situationally specific contexts.²³ The identities of those who move through and live in them provide much of that context. As such, the building must be adaptable to the changing needs of its inhabitants and users.

An example of a space that is readily adaptable in a very literal sense is the Hong Kong apartment lived in and designed by architect Gary Chang. By creating sliding walls that hold the different features of his apartment, the 344-square-foot space can be quickly turned into 24 different rooms.³⁰ Different walls contain bookshelves, counters, cupboards, etc.; the apartment can change from lounge, to kitchen, to bedroom, to bathroom with ease.³⁰ By creating different rooms within the same space, it allows for a relatively large living space potential for a minimal environmental impact. The apartment becomes an impermanent space, continually changing form and purpose to fulfill the current needs of its inhabitants.

The building is embedded within the environment, going beyond zero-impact to actively supporting the local ecological community.

A lot of work has already gone into developing a framework for minimizing the environmental impact of buildings. By looking holistically at building materials and adopting a lifecycle analysis approach, several key features of sustainable homes are clear. A useful and thorough list of characteristics for a sustainable home is

given by Kilbert, Sendzimir, and Guy, who argue that a sustainable home is one:

- “(i) that is readily deconstructable at the end of its useful life
- (ii) whose components are decoupled from the building for easy replacement
- (iii) composed of products that are themselves designed for recycling
- (iv) whose bulk structural materials are recyclable
- (v) whose metabolism would be very slow due to its durability and adaptability, and
- (vi) that promotes health for its human occupants”²¹

An important dimension of these characteristics, and lifecycle analysis approaches in general, is the full consideration of the building’s place temporarily. There needs to be thought put into what the building will be and the impacts it will have at all stages of its existence.

Beyond minimizing the impacts of the materials the home is built from, the home can also be a site for promoting and supporting the nonhuman members of the local ecological community. This can be seen to different extents in many examples, including vertical green systems and green roofs, which have been incorporated into building designs with increasing frequency.³¹ Not only do they reduce heating-related energy consumption and improve air quality, they also preserve local biodiversity. Constructed wetlands are also a good example, providing a sustainable method of treating domestic waste and providing habitat space.³² Some homes have even been built into the ground, so as to prevent any loss of space for vegetation and nonhuman animals. Examples of this are eco-cottages being designed by Patkau Architects in Bear Run Nature Reserve, Pennsylvania.³³ The eco-cottage was a proposed design where the house is built into an existing hill with the only part visible from outside being the windows.³³ The roof of the house is then the top of the hill, meaning wildlife are still able to live there as well.³³ The design minimizes the ‘intrusion’ of human-built spaces within natural spaces; instead it promotes a more gradual flow and meld between them.

Finally, this principle aims for homes that are responsive to their environment rather than resistant to it. The goal is, ultimately, to strive towards the creation of living buildings that achieve a degree of homeostasis, which is “the tendency of living systems to gravitate towards a particular adaptive state in the face of disruptive perturbations.”³⁴ Rather than the current practices of stopping any perturbations at the boundaries of the building, an eco-queer home has walls

that are adaptive interfaces. For example, the walls could be low-pass filters, which would prevent turbulent winds from passing through while still allowing air ventilation.³⁴ The location and boundaries themselves of the house could also become impermanent, with the structures occupying the site in a transient manner, like the floating balloon homes designed by a graduate student at Oxford Brookes University.²⁴

The building's design and use engages technology and nature as active agents.

Engaging nature as an active co-creator has been done in some fields, though it is not always conceptualized in this way. Biomimicry especially positions nature as “model, measure, and mentor.”³² The Eastgate Center in Harare, Zimbabwe, shown in Figure 2, uses a passive heating-ventilation-air-conditioning (HVAC) system that is based off the infrastructure of termite mounds.³⁴ The mounds serve as climate-control infrastructure for the termite colony's subterranean nest, by creating an induced flow through the structure.³⁴ The Eastgate Center used that concept and the basic structural shapes of the termite mounds to inform the design of the building's HVAC system. By allowing

its occupancy and the environment.”³⁶ Intelligent building design allows the technology embedded within the house to actively engage with the users to define the space, and its characteristics, from moment to moment. A kinetic sculptural installation called “The Capacitor”, designed by John Grade, provides an interesting example of how technology and nature can be actively engaged in creating transient spaces. The piece is composed of a coil that curls and uncurls based on wind patterns from outside the building, mimicking the ebb and flow of the breeze.³⁷ The walls of the coil are made of a white fabric-like material which diffuses the lights within them; the soft lighting brightens and dims based on the outside temperature.³⁷ People then lay inside the curl and experience its shifting form, and are able to experience the environment outside through a new means. This has potential to show how homes might be designed such that people in them are not separated from the environment outside, but instead experience it and allow it to help shape the space. When environmental conditions are linked more directly to people's lives, there is a possibility for new and more intimate connections with nature to be developed and explored.

The local context of the building guides its design and use, and low-tech solutions are preferred over high-tech ones.

Seeking low-tech solutions before using high-tech solutions provides several important advantages. First, it will usually be the more accessible solution, especially for poorer communities. Second, it typically consumes less energy, as demonstrated by the passive heating and cooling system used in the Eastgate Centre discussed above. And lastly, it is less likely to involve components made of rare earth metals that exist in limited reserves or composite materials that cannot easily be separated for reuse and recycling.

It has been established that the cultural background of a community has an immense influence in the local needs for people's quality of life, as well as their usage of the space.⁵ As such, it is crucial that engineers understand how the local environment and culture have shaped architecture in the region.³² Technical training should shift away from universal design solutions and methods to focus more instead on the unique environmental conditions of regions they will be working in.²⁴ In promoting and fostering local culture, the result will be a decentralization of design and societal infrastructure, where energy and resource production becomes small-scale and locally controlled.²⁴

This final example of home design is especially useful because it brings in a

number of the different principles of this proposed framework. The home, called “Casa Pentimento” is in Quito, Ecuador and was designed by architects Jose Maria Sáez and David Barragán.³⁸ The building was constructed using prefabricated modular concrete pieces, comparable to giant Lego blocks, and steel rods, which allowed for a uniquely shaped home built around the existing trees, which was a restriction put upon the designers by the owners of the property.³⁸ The concrete modules also form slits when stacked, creating a passive heating and ventilation system for the home and a lot of natural lighting.³⁹ Another notable aspect of the modules is that they are designed so that different pieces, like stair treads or furniture, can be inserted into them, allowing the functionality of the spaces to be easily changed, as well as enabling living walls to be installed within them.⁴⁰

Because the home is designed around an existing garden, the resulting rooms are quite open; there are virtually no doors in between rooms and where there are doors to outside, they are glass sliding doors.³⁸ It is easy for the spaces to be changed and adapted to the needs of the users because of this open concept, and there are almost no places where a user is not close to some greenery.³⁹ While the concrete itself is not a preferable choice for a sustainable material, the use of the modules and design aims are quite impressive. The home was designed to fit around and within the existing garden, there is high flexibility in what features can be used within the home, and low-tech air conditioning and lighting solutions are employed.

Conclusion

Engineering is a political endeavor. The ways engineers decide what to solve, and the ways by which they decide to solve them, are the manifestations of those often-ignored politics. By purposefully engaging with social theory to challenge those underlying politics, new possibilities arise to conceptualize and address design problems.

The eco-queer housing design framework presented creates a means of positioning the home as an eco-sociotechnical artifact, a conceptual and physical space in which the complex interrelations between the individuals navigating it, nature, society, and technology play out. It becomes a site for social justice and a deconstruction of the normative, thus creating space for queer alternative narratives to develop within an ecological community. Instead of aiming to minimize society's impact on the environment, the conversation shifts to how humans and society can be supportive members of the ecological communities we



Figure 2. Harare, Zimbabwe: Eastgate Centre with its rooftop chimneys, which serve to drive the passive HVAC system³⁵
Photo by: David Brazier

for a more interpretive view of nature and “exploring the notion of discourse, we highlight the social production of space, place and the environment; we challenge the assumption that the environment is merely a physical entity and resist the categorization of it only in scientific terms.”²²

One aspect of this principle that is more difficult to understand is how technology can be an active agent in design. One of the most obvious ways for this to be achieved is through the design of an intelligent building. An intelligent building is “one that is not only able to react and change according to individual organizational and environmental requirement, but is also capable of learning and adjusting performance from

exist within. Additionally, by conceptualizing technology and nature as co-engineers in the design process within the garden metaphor, homes can fully realize the concept of being a living building, with lessons drawn from natural systems.

Perhaps one of the most important dynamics common throughout the social theories used is the breaking down of artificial binaries and categories to create space for imagination. Tearing down those boundaries means sitting with the new uncertainty and confusion of the uncategorized. It means looking for new ways to make sense of reality and imagining what could be. Ultimately this project is a pursuit of that imagination. This framework, and the theoretical homes that would be produced by using it, is an exploration of the potential that exists when the rules of engineering are challenged at a base level. In describing the cyborg, Haraway asks, "Why should our bodies end at the skin?"¹⁹ In that line, engineers should be asking, "Why should our homes end at the walls?"

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¡Patria, protestad!

BY ELÍAS MANUEL HERNÁNDEZ ESCALANTE
UNIVERSIDAD AUTÓNOMA DE YUCATÁN, MEXICO

English translation follows

Para Alejandra porque entiende la muerte

Cuando nos divorciamos
las arrugas eran cartografía de su rostro,
la altura se desparramó por la tierra,
todos los árboles mudaron en varillas de hierro y cemento.
Horrible, inmemorial, ya no servía para nada.
Vendí su pellejo después de separarnos,
miles taladraron su antes delicioso vientre:
cuerpos muertos ensamblados, de manufactura;
autómatas in vitro germinaron de hormigueros profundos
donde rumores de martillos son nanas y titilan con cariño:
“cálmate, siempre nunca estuvimos solos”
(con chillidos, balbuceos de pistón, me juran y perjuran su lealtad).
Siembra de moretones, cadenas, petróleo, vergüenza, ceguera.
Sexo fragmento cosechamos la pasada sequía.
Arranqué el anillo de su cutícula y mastiqué
hasta deglutir el oro, la plata, el plutonio.
Ahora es pozo infértil.
Ahora es yo mismo y mi reflejo
a compra/venta en las dos caras
de cualquier aparador.
Ahora es unos pocos aferrados a
pelearse la custodia argumentando el abandono.

Yo vendo,
río alegre, contaminado en carcajada,
al mejor postor, a la prensa, a mis amigos,

a quien quiera

un cuerpo muerto: seco, desnudo, acribillado

y en oferta.

Homeland, protest!

BY ELÍAS MANUEL HERNÁNDEZ ESCALANTE
AUTONOMOUS UNIVERSITY OF THE YUCATÁN, MEXICO

To Alejandra: she understands death

When we got divorced
wrinkles were the cartography of her face,
height scattered over the earth,
every tree changed into steel ribs and cement.
Horrific, immemorial, it was no longer useful.
I sold her skin after splitting up,
thousands drilled her once delicious belly:
assembled dead bodies, manufactured,
in-vitro automatons germinated from deep anthills
where the buzz from hammers is a lullaby and twinkles with affection:
'calm down, we were never alone'
(they swear and swear their loyalty to me with shrieks and piston babblings.)
Sowing of bruises, chains, oil, shame, blindness.
Fragments of sex were the harvest from the last drought.
I pulled out the ring from her cuticle and chewed
until the gold, silver and plutonium were swallowed.
Now it is an infertile well.
Now it is myself and my reflection
to trade both faces
in any display window.
Now there are a few held on
to fight the custody stating abandonment.

I sell,
cheerful river, polluted with a loud laughter,
to the best bidder, to the press, to my friends.

to anyone

a dead body: dried, naked, riddled

on sale.

Inequitable marriage: Financial dependence of women in the Victorian novel

BY GAVRIELLA LEVY HASKELL

SMITH COLLEGE, MASSACHUSETTS

What was [a wife's] personal property before marriage [...] becomes absolutely her husband's, and he may assign or dispose of them at his pleasure whether he and his wife live together or not[....]

Equity is defined to be a correction or qualification of the law, generally made in the part wherein it faileth, or is too severe[....] While the Common Law gives the whole of a wife's personal property to her husband, the Courts of Equity [...] oblige him to make a settlement of some portion of it upon her, if she be unprovided for and virtuous.

If her property be under 200l., or 10l. a-year, a Court of Equity will not interpose.

Neither the Courts of Common Law nor Equity have any direct power to oblige a man to support his wife,—the Ecclesiastical Courts [...] and a Magistrate's court at the instance of her parish alone can do this[....]¹

Victorian British marital property law consisted of a mess of contradictory legislation, applied inconsistently by judges in several different courts. To secure her separate property as a wife against an uncooperative husband—supposing, that is, any marriage settlement had been made for her in the first place (a privilege of upper- and middle-class women with access to “a competent lawyer”²)—a woman would have had to brave the notoriously unreliable court described in Charles Dickens’ inheritance-focused *Bleak House*: the Court of Chancery. Pin money (a yearly payment, arranged at the time of marriage, to be paid to a wife) in arrears might be sued for. That being said, unless it was withheld “without any implied acquiescence on her part”—not suing, of course, constituting acquiescence—she could get at most a year’s worth, and even this only if her husband had not “provided her with clothes and other necessities.”³ Sometimes judges were more generous, sometimes less. Poorer women were essentially out of luck; under the Common Law doctrine of coverture, everything a wife possessed belonged to her husband, and they had no recourse to equity.⁴ These conditions persisted throughout the nineteenth century: even the Married Women’s Property Act of 1882 “neither repealed coverture nor provided *feme sole* property rights for married women.”⁵

It was in this context that Victorian authors wrote: no wonder, then, that in “Victorian novels [...] the middle-class heroine’s marriage prospects are also her economic prospects.”⁶ This was true of poor women, too, but they might take a job without losing social status. No such luck for a middle-class woman; with the single—slightly tenuous, as many Victorian authors

(themselves women) would intimately have known—exception of authorship, any form of employment would mean a lessened position in society for a woman. Even governesses suffered from the discredit employment brought,⁷ and were furthermore habitually underpaid.⁸ On the other hand, while marrying a generous man with money might afford a middle-class woman a fair degree of independence and preserve her status, heaven help her if her husband tended towards profligacy or miserliness. Even if she had marriage settlements, contradictory and unpredictably enforced law⁹ meant she might or might not actually have recourse if her husband ignored those provisions.

For some authors, this precarious economic position became a point of social criticism. George Eliot “researched not only the immediate effects [of property law] on women’s position, but also the ideological assumptions embedded in the laws of inheritance and of kin,” and *Middlemarch* clearly reflects its author’s research.¹⁰ After all, *Middlemarch* describes the marriage of Dorothea Brooke first to the old and miserly Edward Casaubon, and then later to the much poorer, but much better suited, Will Ladislaw. Casaubon attempts to prevent her remarrying after his death by leaving his money to her on condition that she not marry Ladislaw, taking advantage of his legal control of their assets as a couple. Similarly, the major conflicts between Tertius Lydgate, a young and intellectually ambitious country doctor from a good family—but without many resources of his own—and his new wife Rosamond Vincy, the socially ambitious and spendthrift daughter of a newly rich merchant, stem from their financial disagreements. Even authors who did not necessarily have a social end in mind could

use the threat of a money-poor marriage—or no marriage at all—to build suspense, or to put up obstacles to their characters’ happiness. The instability of women’s financial futures gave weight and consequence to stories that today would be considered frivolous: a marriage plot means more when it potentially determines someone’s ability to eat.

Naturally, as happened in life, some nineteenth-century female characters end up as the perfectly comfortable beneficiaries of their husbands. As Charlotte Brontë writes in a letter to her friend Ellen Nussey, “in many cases [...] money is a very desirable contingent of matrimony.”¹¹ For a Victorian author, though, Brontë seems to hold an unusually optimistic view of men’s likelihood of supporting their wives—an optimism evidenced particularly in *Villette*, in which even the characters whose economic futures seem most tenuous end up relatively secure. Ginevra Fanshawe—who seems, due to her flirtations, determined to wind up in disrepute and poverty—ends up none the worse for the gambling debts her husband incurs. After her marriage, her greatest concerns revolve around her child. Lucy Snowe, who never marries her eventual beau Paul Emmanuel, nevertheless receives from him the means of supporting herself for the rest of her life. Such hopefulness seems strange coming from an author with such derision for the “wishes of those who demanded that fiction should provide the conciliatory, neat happy endings which life fails to deliver.”¹² Indeed, the fact that Brontë clearly still considers *Villette* a tragedy seems to suggest that for her, love really is the weightier consideration¹³—which makes sense, considering she and her sisters (though never wealthy) lived comfortably enough without husbands by trading stocks.¹⁴

Such certitude of material comfort is uncommon in Victorian literature; more often than not, the financial dependence a woman faces in marriage presents a threat instead of a comfort, since a Victorian woman—even outside of a novel—could do little about a poor or spendthrift husband. For women who were not wealthy enough for the courts of equity, “whatever the circumstances, the husband remained legally the owner or custodian of the family property, and [...] he could use this property, including that brought to him by his wife, in any way he chose[...]; he could leave his wife and children penniless.”¹⁵ It is perhaps this appropriation of property, even more than his habit of borrowing whether his lenders can afford it or not, that Charles Dickens uses to make Harold Skimpole so loathsome in *Bleak House*. That said, both Skimpole’s borrowing and his disregard for his family’s financial stability come to a head simultaneously when Ada, Esther, and Mr. Jarndyce (the friend from whom Skimpole borrows most often) visit his home to ask him not to take money from the impecunious Richard. Not only does Skimpole demur, but when he leaves with the three of them it seems “to escape his consideration that Mrs. Skimpole and the daughters remained behind to encounter the baker” whose furniture Skimpole had destroyed, and who, when he does show up, will presumably expect payment for the damages.¹⁶

Financially profligate (or even actively predatory) husbands weren’t the sole purview of poorer women; wealthier women, those with separate property agreed on at the time of their marriage, were not immune. Often enough, “despite separate property being secured to them, women were[...], as contemporaries said, ‘kissed or kicked,’ ‘bullied or coaxed’ out of it by husbands who had physical or emotional power that rendered their wives’ legal powers nugatory.”¹⁷ Even an attempt to exercise those legal powers did not guarantee success in such cases; on one occasion, an appeal to the law when “a wife sold part of her separate estate [...] ‘by compulsion of her husband, and for fear of losing her life if she refused,’” ended in the court declaring that, as “she is considered as a feme sole” where it concerns her separate property, the sale was valid.¹⁸

At the same time, for middle-class women, any marriage could be better than none at all. As Gail Houston points out, “for the many ‘superfluous’ women who could not find a partner, the culture’s answer seemed to be that marriage was the only way it was willing to support middle-class women.”¹⁹ John Jarndyce’s offer of marriage to his ward, Esther, in *Bleak House* is an

emotionally unsatisfactory effort to preserve her from the material discomfort of middle-class, or once-middle-class, spinsterhood. The illegitimate daughter of a hitherto-unidentified mother, her prospects are bleak at best. Though she will ultimately marry Dr. Allan Woodcourt, he has gone overseas—to the best of their current knowledge, permanently—in the hopes of making a living as a doctor abroad. The offer of marriage is one Jarndyce would not make if economic independence appeared to be an option for Esther; indeed, Victorian authors often use the dread of destitution to place characters in, or threaten characters with, otherwise obviously incompatible marriages. The situation is not a purely fictive one, either. English Bluestocking and paper artist Mary Delany wonders, nearly a century before any of the books considered here were written: “Why must women be *driven to the necessity* of marrying? [...] And if a young woman has not fortune sufficient to maintain her in the situation she has been bred to, what can she do, but marry?”²⁰ The concern remained relevant throughout the nineteenth century. As Gillian Beer points out, “[m]arrying for money, when the alternative is to live in the woman’s land of governessing, seamstressing, or even aimless genteel poverty, is a real alternative. It may give women some form of independence, a household to manage, funds to dispense, a career of a kind.”²¹ Just as Dickens could not have held the reader in such suspense over Esther’s relationship with Woodcourt if she had not had a real incentive to marry Jarndyce, he could not have constructed the whole story of *Bleak House* in the same way if Lady Dedlock could have reasonably married the poor Captain Hawdon with whom she had Esther, instead of the wealthy Lord Dedlock.²²

Although the Dedlocks’ marriage actually turns out to be surprisingly affectionate, the emotional intimacy of many Victorian marriages, in and out of literature, is often compromised by their economics. Charlotte Brontë “contends that ‘cash’ makes all the difference in a romantic relationship,”²³ and many of her fellow authors seem to agree. *Middlemarch*’s Tertius Lydgate and Rosamond Vincy would make a much better match if they didn’t spend so much time at odds over their finances, although, as J.D. Milne comments, they already have little in common: “Poor Lydgate! or shall I say, Poor Rosamond! Each lived in a world of which the other knew nothing.”²⁴ Even in situations where amount of capital cannot reasonably generate conflict, the question of who holds the purse strings could still complicate a marriage. George Eliot (author of *Middlemarch*) could not have made Edward Casaubon so plausibly commandeering

had Casaubon not felt himself Dorothea Brooke’s benefactor—not to mention that he might not then have felt it his “duty to hinder to the utmost the fulfillment of” what he saw as Will Ladislaw’s mercenary designs on her.²⁵ Supposing Casaubon had not rewritten his will, Eliot might have had to find a different way of putting off Dorothea’s marriage than using Ladislaw’s belief that “marriage to him [...] would mean that she consented to be penniless” to crush his “secret hope that after some years he might come back with the sense that he had at least a personal value equal to her wealth.”²⁶ As it stands, though, Eliot, like other Victorian authors, could make use of her female character’s presumed financial dependence to prolong the suspense before her marriage.

With financial dependence offering so many opportunities for doubt and drama, it is unsurprising that authors choose to grant relatively few of their Victorian heroines enough money to subsist comfortably on their own. That said, for those who do command fortunes, their property would still in large part be considered their husbands’ when they married—to the extent that “if a woman who accepted a proposal of marriage sought, before the marriage took place, to dispose any of her property without the knowledge and consent of her intended husband, the disposition could be set aside as a legal fraud”²⁷—so fortune hunters could still provide a source of drama. Even above that, as “[i]n George Eliot’s novels [...] money does not guarantee independence,”²⁸ so it did not eliminate the possibility, as an author, of putting the heroine through her paces. However, in many cases (in novels as in life) wealth does allow a woman an unusual degree of liberty, especially in her choice of husband. Though she does not grant her independence, Eliot can permit Dorothea to marry Ladislaw in spite of his “position, outside money inheritance, sharing the awkward financial dependency more often associated with women.”²⁹ Indeed, in actuality, “after marriage, wealthy women who had separate estates were the most liberated group of women in nineteenth-century England, [...] although [...] for this reason they were often hated and feared, envied or derided, and verbally censured (behind their backs).”³⁰ Interestingly, in the Victorian novel women with stable and independent fortunes mostly escape scorn, probably because they almost always dispose of it quickly to some deserving man or other, or at least feel guilty for possessing it in the first place. Authors instead choose women who like or spend money as villainous foils for their virtuous heroines. How unequivocally awful the unnamed female teacher’s avarice seems in Charlotte Brontë’s *Villette*, showing

Lucy Snowe “as a mark of high favour, [...] a hoard [...] of coarse, large coin—about fifteen guineas, in five-franc pieces.”³¹ Her enthusiasm stands as a foil to Lucy’s careful, but less acquisitive, approach to money.

Even worse, to the Victorian author’s eye, are those women who spend other people’s money (ignoring, of course, the fact that for married women in the Victorian era, the only money they ever had was considered “someone else’s”). Rosamond Vincy’s profligacy should be read as painful and dispiriting, and yet Lydgate’s objections to her behavior closely parallel the arguments of those opposing the separate apportioning even of just pocket money to wives. Susan Staves summarizes a contemporary view objecting to pin money, writing that “requiring the husband to pay pin money, it was said, gave the husband and wife separate interests [...] and, what was perhaps worst, made the husband’s payments to the wife seem to depend on her right rather than on his generosity, thus, it was said, not inspiring appropriate wifely gratitude.”³² When “the culture confronted [middle-class women] with impossible expectations: [...] they must rely on husbands, fathers, and brothers for economic support but not understand money,” it seems unreasonable to completely demonize characters who fail to meet them.³³ Such figures as *Middlemarch*’s Rosamond, who spends her husband’s money on fripperies and resents his insistence that she not; Ginevra Fanshawe, who, in *Villette*, jeopardizes her financial future by committing that grave sin of flirting with the insufficiently affluent; or even Madame Malravens who, also in *Villette*, continues to extort money from the man who might once have married her daughter many years after that daughter’s death, are all products of their time. They are, in effect, expected to be Harold Skimpole—and then punished for meeting expectations.

What is most interesting, though, is the way authors write about women’s lives in a society in which “women [...] were] ‘doubly enjoined against seeking their own economic success: first by the strictures of bourgeois society in relation to work and the marketplace, and second by the values of romantic love as they affected marriage.’”³⁴ In such a culture, marriage itself becomes a sort of Morton’s fork: do not marry, and you may end up penniless, but marry, and your husband may make you penniless. However, that sort of dilemma could become a useful driving force in the Victorian novel: authors could raise the stakes of the marriage plot by involving not merely a woman’s heart, but also her stomach. That pattern began before and continued beyond the nineteenth century, even outside of Britain: Edith

Wharton’s 1905 novel *House of Mirth*, set in the nineteenth century, boils down to a tale of financial insecurity and middle-class women’s reliance on marriage for mere subsistence. It is no wonder, then, that the marriage plot has become so generally disparaged; when a woman can, and is generally expected to, make a living on her own, in or out of marriage—and her husband is *not* expected to lay claim to her every worldly good—the choice of a husband becomes considerably less a matter of life or death.

References:

- ¹Milnes, M. (1854) “A Brief Summary, in Plain Language, of the Most Important Laws Concerning Women; Together with a Few Observations Thereon.” In *On the Property of Married Women and the Law of Divorce*. John Chapman. Pg 6–7.
- ²“There are great difficulties and complexities in making settlements, and they should always be made by a competent lawyer.” Ibid. 8–9.
- ³Spence, G. and Maddock, H. (1849) *The Equitable Jurisdiction of the Court of Chancery*. V. and R. Stevens and G.S. Norton. Pg 501.
- ⁴“Marriage settlements and appeals to the Courts of Equity helped [upper- and middle-class] women, but the courts occasionally failed to do justice, and moreover ‘legal devices, patched upon a law which is radically unjust, can only work clumsily.’ For women of the lower classes, marriage settlements and actions in equity were out of the question.” Lyndon Shanley, M. (1989) *Feminism, Marriage, and the Law in Victorian England, 1850–1895*. Princeton University Press. Pg 32.
- ⁵Stetson, D. (1982) *A Woman’s Issue: the Politics of Family Law Reform in England*. Greenwood Press. Pg 54.
- ⁶Houston, G. (2005) *From Dickens to Dracula: Gothic, Economics, and Victorian Fiction*. Cambridge University Press. Pg 54.
- ⁷“Sophia Jex-Blake’s father told her that if she accepted a salary she ‘would be considered mean and illiberal, ... accepting wages that belonged to a class beneath you in social rank.’ Others put it more strongly: ‘Society has thought fit to assert that the woman who works for herself loses her social position.’” Peterson, M. (1972) Pg 6.
- ⁸“Pay was notoriously low. Governesses were, of course, housed and fed, but they were expected to pay for such expenses as laundry, travel, and medical care. They had to dress appropriately, and it was wise for them to make their own provisions for unemployment and old age. A governess often tried to support a parent or a dependent sister or brother as well.” Peterson, M. (1972) “The Victorian Governess: Status Incongruence in Family and Society.” In *Suffer and Be Still: Women in the Victorian Age*. Martha Vicinus, ed. Indiana University Press. Pg 7.
- ⁹See note 4.
- ¹⁰Beer, G. (1986) *George Eliot*. Indiana University Press. Pg 169–170.
- ¹¹Houston, G. (2005) Pg 52.
- ¹²Flint, K. (2013) “The Victorian Novel and Its Readers.” In *The Cambridge Companion to the Victorian Novel: Second Edition*, David, D., ed. Cambridge University Press. Pg 21.
- ¹³Tim Dolin suggests that “[t]he unresolved ending may be read as a fantasy of property and freedom [...] in which] Lucy’s suspended marriage is in many ways the appropriate condition for a heroine desperately seeking both security and independence.” In a way, that makes equal sense for a woman used to managing her own affairs financially—Brontë’s father being, as Houston points out on pages 59–60 of *From Dickens to Dracula*, rather a worse bookkeeper than she, even while alive—but does not explain the surprising material comfort of every other female character in

the novel. Dolin, T. (1997) *Mistress of the House: Women of Property in the Victorian Novel*. Ashgate Publishing Limited. Pg 53.

- ¹⁴Houston, G. (2005) Pg 55–56.
- ¹⁵Holcombe, L. (1983) *Property: Reform of the Married Women’s Property Law in Nineteenth-Century England*. University of Toronto Press. Pg 36. That said, as Sara Zeigler comments of nineteenth-century America, “to speak of the husband’s proprietary interest in his wife’s labor or his ownership of her work is to head down the wrong path—toward the claim that the wife, herself, was the property of her husband. But a wife was not a slave.” Ziegler, S. (1996) “Wifely Duties: Marriage, Labor, and the Common Law in Nineteenth-Century America.” *Social Science History*. 20. 1. Pg 66.
- ¹⁶Dickens, C. (2008) *Bleak House*. Oxford University Press. Pg 626.
- ¹⁷Staves, S. (1990) *Married Women’s Separate Property in England, 1660–1833*. Harvard University Press. Pg 135.
- ¹⁸Ibid. Pg 152. The case referred to is *Grigby v. Cox* (1750).
- ¹⁹Houston, G. (2005) Pg 54.
- ²⁰Hayden, R. (1980) *Mrs. Delaney, Her Life and Her Flowers*. British Museum Publications. Pg 38.
- ²¹Beer, G. (1986) Pg 171.
- ²²“In fact, [Lady Dedlock] had in early life been engaged to marry a young rake[*], Captain Hawdon*—he was a captain in the army—nothing connected with whom came to any good. She never did marry him, but she gave birth to a child of which he was the father.” Dickens, C. (2008) Pg 601.
- ²³Houston, G. (2005) Pg 52.
- ²⁴Beer, G. (1986) Pg 158.
- ²⁵Eliot, G. (2008) Pg 395.
- ²⁶Ibid. Pg 588.
- ²⁷Holcombe, L. (1983) Pg 18.
- ²⁸Beer, G. (1986) Pg 170.
- ²⁹Ibid. Pg 172.
- ³⁰Perkin, J. (1989) *Women and Marriage in Nineteenth-Century England*. Lyceum Books, Inc. Pg 76.
- ³¹Brontë, C. (2004) *Villette*. Penguin Classics. Pg 139.
- ³²Staves, S. (1990) Pg 158.
- ³³Houston, G. (2005) Pg 52.
- ³⁴Ibid. Pg 54.

Midnight memories

BY NICOLE CATHERINE MASSEY-SMITH
COLORADO STATE UNIVERSITY, COLORADO

The pavement drenched with midnight memories
clock hands of water topple down to kiss
the earth with dying seconds, melodies—
and cloaks its hide in tears of sky's abyss.

Reflections dance and clasp the hands of light,
the shadows spinning round to starlit waltz.
Hear laughter echo down rain's chime so bright
and cling time's ever fleeting fickle salts—

let tears not swallow the eyes of the past
in angst of seeing end's abrupt approach,
for mind's museum the moment ever lasts.
Be free, together sing in time's caroché.

Hold moonlight's hand through midnight memories
and laugh with starlit eyes, hope's clarity.

100

BY NICOLE CATHERINE MASSEY-SMITH
COLORADO STATE UNIVERSITY, COLORADO

Growing Growing Growing Up. Please stop. No more. Colors fade
drunken Laughter
weeps
seeping green paper
(stoic faces)
cutting
(laughing frowns)
all the way down

Growing Growing Growing Up. Dark. Grass melts to
concrete
playdough to papers
Neverending
Papers
(sewn to skin)
sinning and drinking
(choking, burning)
in hopes to taste

Sinking Sinking Sinking Down. Resting lids pressed under
air, dirt
warm, dry

Finally sleep.
Finally dreams

in Color.

KADIN KOSTELIC

COLORADO STATE UNIVERSITY, COLORADO



K. Kostelic, *Accidental Connections*, 2012
Acrylic paint on paper; 12" x 12"

My artwork revels in visual impact. Instead of pursuing a conceptual goal, I explore the formal qualities of artwork; its surface texture, color and line. In that way, I think of myself as a designer rather than a traditional artist.

My art is metaphor, as opposed to narrative. Rather than trying to spell out a story, I attempt to communicate a feeling, a state of being. Like a candid photograph, my work seeks to capture transient moments of beauty. Although my work varies widely in medium, subject and purpose, my pieces all retain a few common characteristics that define my style. I would describe these qualities as subtlety, dynamism, sophistication, and abstracted realism.



K. Kostelic, *I Feel It In My Bones*, 2014
Black ballpoint pen on white paper, white conte
on black charcoal paper; 24" x 22"

ALEJANDRA GUADALUPE MEDINA MÁRQUEZ

UNIVERSIDAD AUTÓNOMA DE YUCATÁN, MEXICO

Cultural festivals are the most dynamic and interesting phenomena in the current cultural and art scene. Reasons in the increase in its importance are based on supply and demand factors, as well as the use of culture in different local and regional development strategies for urban regeneration. Cultural festivals are urban space reclaimers as an ludic space: spaces for creative interpretation of urban life.

In this context, the project finds a chance for art students to be part of Mérida Fest, which is a festival that emphasizes the ancient culture of Mérida, México. The project named ART UNIVERSITY PAVILION, creates a space for art production showcased by university students for university students, fitted to present artistic expressions like paintings, sculptures, light shows, videos, sounds and performances, set up yearly in different festival locations.

The idea of the project is based on the nature of street play in the creation of ludic space, because it has the power to strengthen the public space as a micro universe where everything is possible. No matter the nature of the play, the generated space characterized for its nature and clarity that limits it, and spontaneity and versatility that it is formed, and the ease in the obtained space.

01

ART UNIVERSITY PAVILION

Cultural festivals are the most dynamic and interesting facts in the cultural and art scene. They are more than a phenomenon with their own cultural value: they transform urban space into ludic space, capable of producing new city perceptions, generating social and cultural identity images.

AUP | UNIVERSITY ARTISTIC EXPRESSION FORUM

It is a space for art production showcased by university students for university students, fitted to present artistic expressions like paintings, sculptures, light shows, videos, sounds and performances, set up during MÉRIDA FEST. By creating a forum for artists in training, Yucatan's essence in art university expression will be reflected, leaving a print in the collective imagination as a space for recreation and leisure in every place where it will be installed.

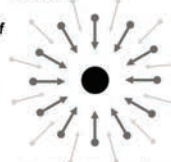
CONCEPTION



Street art nature: creator of ludic space.

It is identified by the ease in which it delimits itself, by the spontaneity and its formation, and by how it moves freely within the space obtained.

IDEAS



Centripetal attraction

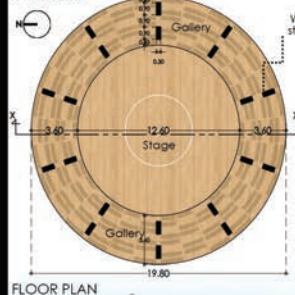


Permeable skin

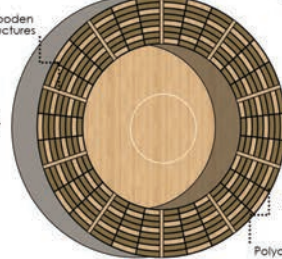


Virtual demarcation by light

PLANS



FLOOR PLAN



ROOF PLAN

ELEVATIONS



SIDE ELEVATION



SECTION X-X'

Polycarbonate

*Scale in meters



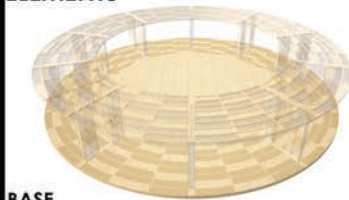
PROJECTS B WORKSHOP: ARCHITECTURE AND ART | MENTOR: ARCH. ROBERTO NOVELO ZOREDA | DESIGN BY: ALEJANDRA G. MEDINA MARQUEZ

A. Medina, *Art University Pavilion*, 2014
Digital image; 90 cm x 60 cm

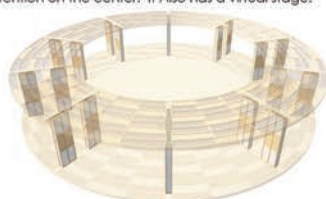
02

ELEMENTS

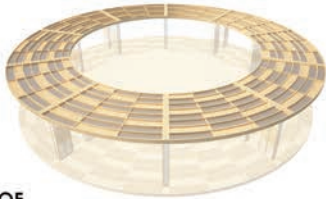
ART UNIVERSITY PAVILION

**BASE**

Horizontal element, with directing shapes which focuses attention on the center. It also has a virtual stage.

**VERTICAL STRUCTURES**

Directing elements which separate virtually the outside and the inside, creating a path that goes through the gallery allowing the center for mass events. At night, they have their own lights to create a virtual layer to contain space.

**ROOF**

Horizontal element that, along with the base, frames the view. It has holes to create light effects.



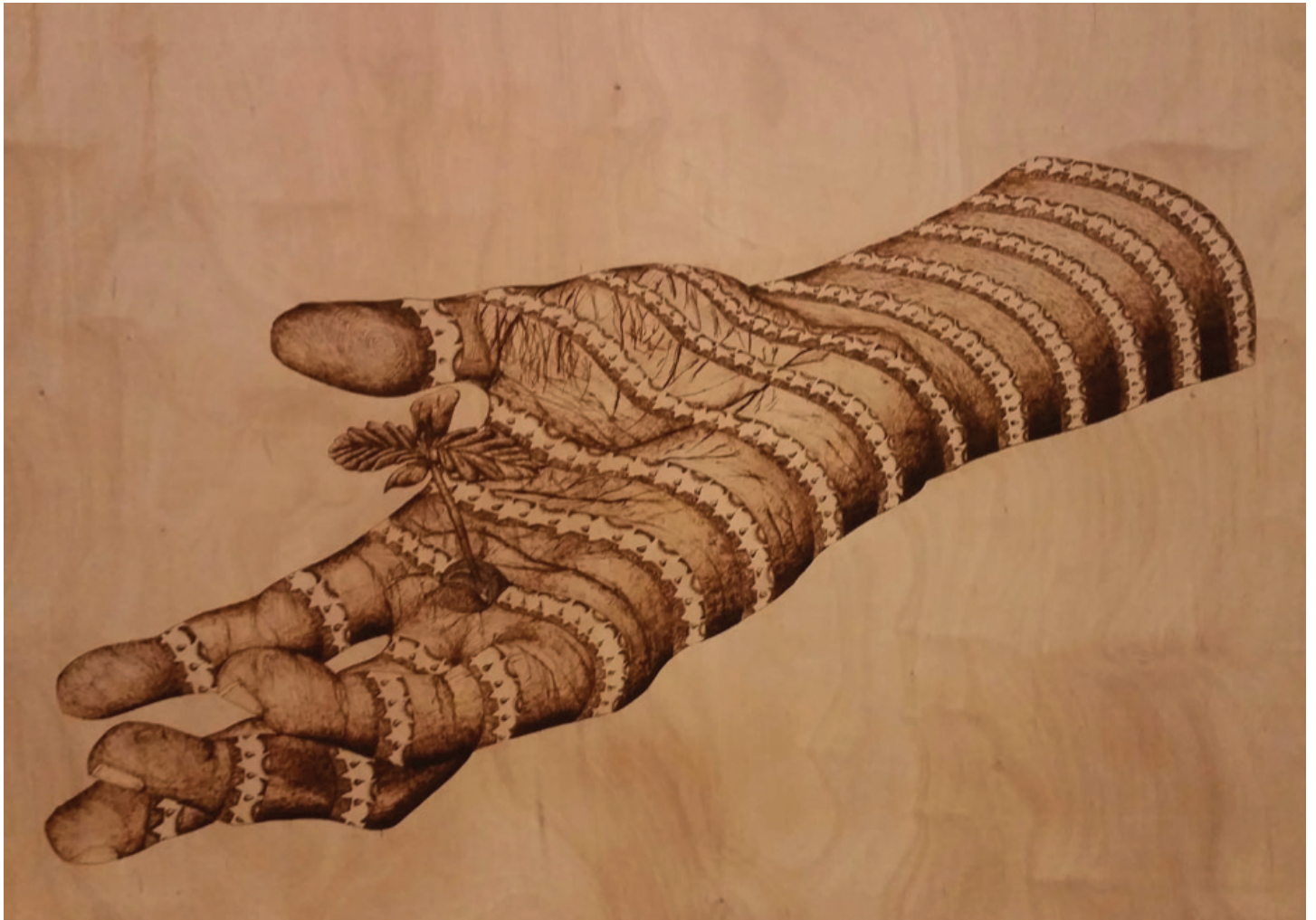
PROJECTS B WORKSHOP: ARCHITECTURE AND ART | MENTOR: ARCH. ROBERTO NOVELO ZOREDA | DESIGN BY: ALEJANDRA G. MEDINA MARQUEZ

The spatial and formal expression of the project arised from the next intentions that were inspired by the generative idea. The first one is the centripetal attraction, the space configuration is result of the attraction that generates the action focus; the second is a permeable membrane, just like the street play have no limits, but people arrangement creates a light membrane that cover the space; and finally, setting virtual limits, where the light as virtual configurator of space, set up the difference between inside and outside of the project.

The naturalness and simplicity expression acquired by the ART UNIVERSITY PAVILION creates a meeting and recreation space that emphasize ties between art and design students, creating a group able to make interesting proposals for art scene in the city.

A. Medina, *Art University Pavilion*, 2014
Digital image; 90 cm x 60 cm

ALEXANDER KUHN
TEMPLE UNIVERSITY, PENNSYLVANIA



A. Kuhn, *The Key*, 2014
Pyrography on Maple; 50" x 37"



The iconography depicted in *The Key* is meant to act as an agricultural instruction manual. If one were to imagine the age before modern agriculture, the human species did not know how to cultivate crops or create organized farming spaces. The imagery on the ribbon wrapping the hand depicts a repeating Sun & Moon placed above successive “V” shaped divots (representing the soil). Between the Sun, Moon and soil, water droplets are continually repeated.

At first glance, the icons may be nothing more than repetitive imagery. Upon deeper inspection, the significance of the pattern reveals itself. If a recipient of the seed could decipher the images represented, they might learn the processes necessary for organized farming. By the ribbon’s instruction, the seedling must first be placed in the soil “V”. Then, each seedling should be evenly spaced out from other seeds and watered between every Sun & Moon (Day and Night). This process must be repeated for 120 days (roughly ~4 months) or the average time for many plants to reach full maturation. On the ribbon, exactly 120 Suns and 120 moons are represented.

I find this medium interesting to work with because I am able to watch the wood transition into a new form. While working, the combustion of the wood causes both a physical and a chemical change. As I burn through the layers, the heat of the iron converts the solid wood into ash. As this is happening, the carbon and the oxygen stored in the wood are released and the aroma of the burning begins to permeate my workspace. Although the reaction is simple, I find the process timeless and meditative.



SYDNEY LACKEY, DAWNA MAZZULLA, AND HALLIE POTTHOFF

COLORADO STATE UNIVERSITY, COLORADO



S. Lackey, D. Mazzulla, H. Potthoff,
Broken Glass, 2014
Glass beer bottles, spray paint,
glue and vinyl plastic; 29" x 68"

Photographs by Stefan Rodriguez

The dress, *Broken Glass* is an illustration of new design techniques using re-purposed everyday items to create something new and unique. The dress design is a one of a kind, made up of glass beer bottles, spray paint, glue and vinyl plastic. The glass was softened in a tumbler to dull down the sharp edges of each piece, so that the garment was wearable. Vinyl plastic was sewn together creating a corset bodice and an A-line shape with an open back. Additional straps were sewn together across the top to give more support due to the heaviness of the glass pieces. Once the dress was sewn and spray-painted, glass pieces were glued individually down the

dress. The glass was intended to look like it was trickling down the bodice starting heavy on top to highlight the corset as the focal point of the garment. The remaining glass glances below the corset creating an overall flow to the gown. What was challenging about this project was creating a garment that could be made functional, yet not be made conventionally using fabrics. Being creative and innovative allowed us to challenge our thinking about materials we use everyday to engineer and create a new style of garment. It allows us designers to use something basic like a shower curtain and imagine it could be used functionally and beautifully in the world of fashion design.

DUY NGUYEN

COLORADO STATE UNIVERSITY, COLORADO

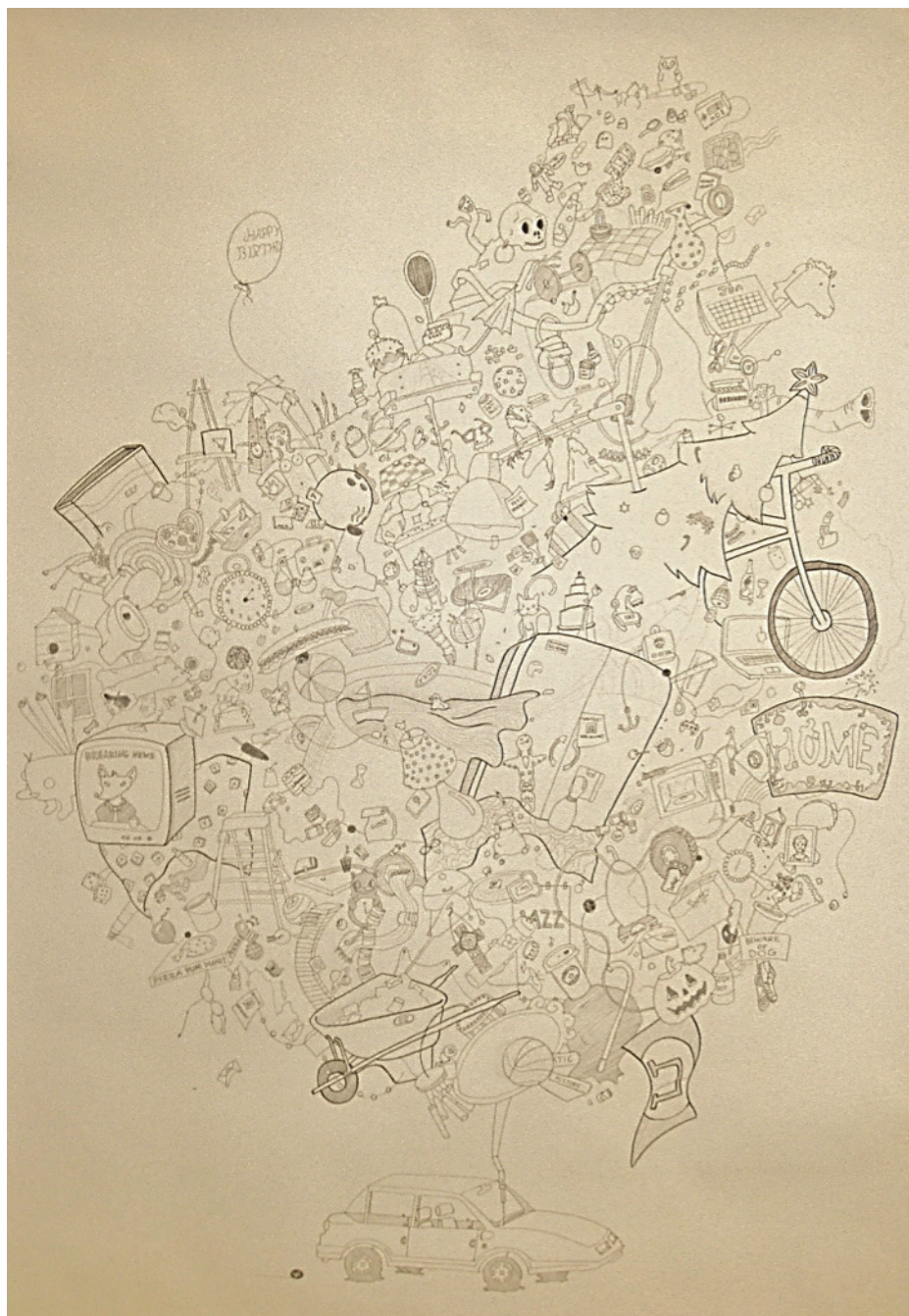
Inspiration comes from what we see and remember and that our minds can craft amazing imagery through our imagination. I am interested in the fantastical and enjoy stepping into realms where imagination is infinite. What inspires me is fantasy and science-fiction and the beautiful worlds that take us beyond our reality. My artwork explores these fantastical imagery through the arrangement of shapes, textures, and lines that guide the viewer through the piece.

Digital media is a newer type of art medium where I find myself using in most of my artwork, but it always begins with initial sketches and experimentation in traditional media. My influences come from video games, comics, fantasy and surreal art, and artists like Alphonse Mucha, Gustav Klimt, Andrew “Android” Jones, and Michael Parkes.

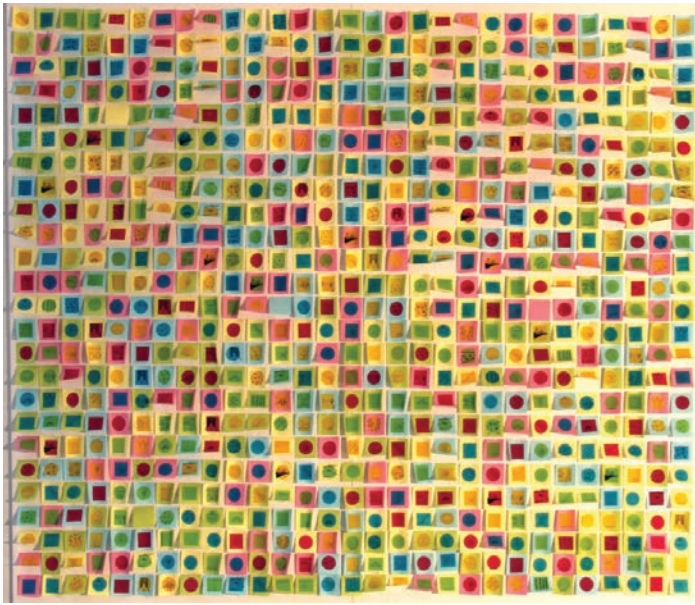


D. Nguyen, *Inspiration for Revolution – Inspired by Andrew Jones*, 2014
Ink woodblock print on Rives BFK; 22.5" x 22.5"

JULIETTE DAVIDIA HEBERT
BOWLING GREEN STATE UNIVERSITY, OHIO



J. D. Hebert, *Rubber Chicken*, 2014
Materials; 4 ft x 5 ft



J. D. Hebert, *Remnants; Things Forgotten, Things Ignored*, 2014
Materials; 8 ft x 6 ft

For the past two years my work has endeavored to bring attention to what we in the twenty-first century often disregard: junk. Junk is all around us; from kitchen appliances and souvenirs to kitschy décor and children's toys. The objects we own (and the objects we throw away) say a great deal about us both as individuals and as a culture. By depicting the objects of everyday life I hope to remind the viewer how much we often depend on the things we own not only as a means of convenience but as a means of identification.

My work exploring the importance and disposability of everyday objects was achieved using two very different possesses. My first work, titled *Rubber Chicken*, is a pen-and-ink drawing that was created as an exercise in stream-of-consciousness narrative. I drew impressions of the first objects that occurred to me, then began building off of those by loosely associating their form and function. This process lead to a fluid, organic composition comprised of odds and ends that interact with each other in humorous and sometimes puzzling ways.

My next work is an installation of 700 screen printed Post-It Notes titled *Remnants; Things Forgotten, Things Ignored*. This work discusses not only the disposability of objects but the disposability of thoughts and experiences as well. Today's fast-paced lifestyle often leaves little time for contemplation and reflection. As a result, it can be easy to grow detached from the present. Printed sentiments such as "I'm so tired" and "I didn't mean it" are a playful reminder that our busy lives are still measured in small moments, as inconsequential as they may seem.

A simplified combinatorial analysis of Charles-Louis Hanon's *The Virtuoso Pianist in 60 Exercises*

BY KATHERINE BURRIS AND LORI CARMACK, PHD

SALISBURY UNIVERSITY, MARYLAND

Abstract

This paper presents a mathematical application of music theory that is accessible to the undergraduate student. In particular, we analyze some simple finger drills published in The Virtuoso Pianist in 60 Exercises by Charles-Louis Hanon (1819-1900), a 19th century French musician. Using Hanon's exercises as a guide, we formulate a model that will generate exercises akin to Hanon's, but in a manner that is simpler and easier to enumerate. We then apply some basic counting methods and theory from the mathematical field of combinatorics to count the number of exercises our model can produce.

Introduction

Enumeration is a common application of mathematics to music theory.¹ Due to the complex nature of musical compositions, such analysis readily extends itself to the use of graduate level mathematics, even for seemingly simple problems. For example, counting the total possible number of different five-note scales that can be created out of the 12 notes of an octave can be addressed using higher level group theory, a concept central to the field of abstract algebra.² Ideas from graph theory can be applied to analyze combinatorial relationships among the 24 major and minor chords.³ Because of this it is challenging to find a mathematical problem in music theory that is both accessible to and worthy of research for an undergraduate mathematics student. The basic compositions of Charles-Louis Hanon, however, provide an ideal setting for such mathematical analysis.

Background

Throughout his life, Hanon produced various works for the organ and piano, but he was most notably renowned for his collection of 60 pedagogical etudes, *The Virtuoso Pianist in 60 Exercises*, first published in 1874. The purposes of the exercises are to help the pianist acquire, "agility, independence, strength, and perfect evenness in the fingers, as well as suppleness of the wrists—all indispensable qualities for fine execution."⁴ The 60 drills transition easily from one to another so that the musician may play through the entire set of exercises in a one hour sitting. At the time of first publication, Hanon's exercises quickly became popular among pianists. By 1878, both the Conservatoire de Paris and Royal Conservatoire of Brussels formally adopted 60 Exercises for the *Virtuoso Pianist* for use. In 1900, the

New York-based music publishing company, G. Schirmer, Inc., first printed its famous edition, making the work available to pianists in the United States. By the early 1900s, the use of Hanon's drills was well established among conservatories and music schools throughout Europe and Russia. The emphasis the Moscow Conservatory placed on the exercises is described by the famous composer and performer Sergei Rachmaninoff, who graduated from the Conservatory in 1891. Recounting examination requirements at the end of the fifth year of the conservatory, Rachmaninoff states, "[The student] knows the exercises in the book of studies by Hanon so well that he knows each study by number, and the examiner may ask him, for instance, to play study 17, or 28, or 32, etc. The student at once sits at the keyboard and plays."⁵ Over the years, "literally thousands of reprints and transcriptions of the exercises have been published in dozens of languages"⁶. Their use continues to be a substantial and fundamental part of many pianists' regimen today.⁷

Hanon's exercises are divided into three parts. Etudes 1—20 make up Part I, Part II consists of exercises 21—43, and the remaining 17 exercises comprise Part III. The sections are purposefully designed to address specific challenges and difficulties that virtuoso pianists face while honing their skills. In this paper, we focus on the exercises in Part I. Each exercise in this section is based upon a simple pattern that appears in the first measure. Subsequent measures are merely a repetition of the pattern set in the previous, but with the hands shifted up the scale by one note (see Figure 1). The exercise proceeds as the hands ascend, shifting up one note at a time per measure for two octaves. The hands then similarly descend down the scale, one note at a time; the exercise ends once the

hands reach their initial position. The right and left hands play simultaneously and in unison throughout the exercise.

When mathematically analyzing the music in Hanon's *The Virtuoso Pianist in 60 Exercises*, a natural problem to consider is the total possible number of exercises Hanon could have composed in Part I, since they appear to be formulaic. As is commonly necessary in mathematics however, we must first consider a simpler problem. That is, we construct a model that will generate finger exercises that are similar to Hanon's, but are based upon fewer notes. We then enumerate the number of exercises our model can produce. To do the counting, rather than applying a brute force method, we instead use a combination of basic counting principles and some theory from the field of combinatorics. This computation provides an interesting and challenging application of undergraduate mathematics to music theory. What follows are the details of the model and the accompanying computation.

Model

In determining assumptions for our model, we aim to produce exercises that are analogous to Hanon's, and that serve to accomplish his goals of developing the agility and strength of the fingers. In addition, the exercises should transition easily from one measure to the next. Finally, we attempt to create exercises that have some type of musical form and are pleasing to the ear. Two fundamental concepts in music theory are the notions of consonance and dissonance. These terms refer to how two or more notes sound in relation to each other. Generally speaking, the human ear prefers the sound of consonant notes, and is somewhat repelled by dissonance. Both however, play an important role in music, as they "work to-

THE VIRTUOSO PIANIST, PART I

Preparatory Exercises to Acquire Speed, Precision, Agility and Strength in the Fingers of Both Hands as well as Flexibility of the Wrists.

The two "Metronome Marks" (M.M.) at the head of the first exercise means to begin playing at "60" and gradually increase the speed to "108". Play all exercises in Part I in this manner.

Exercise 1 gives practice in stretching the 4th and 5th fingers of the left hand while ascending, the 4th and 5th fingers of the right hand while descending. Lift the fingers high and play each note distinctly.

M. M. ♩ = 60 to 108 C. L. HANON

1. (Ascending) *mf*

2.

10.

18.

Figure 1. The first few measures of Hanon Exercises 1, 2, 10, 18⁴

gether to create interest, drama, and beauty.”⁸ Dissonance brings an unsettled and expectant feeling, while consonance is used to resolve that feeling. Hanon’s etudes have a strong consonant sound. Also, the vast majority of compositions, including Hanon’s 60 Exercises for the Virtuoso Pianist, are based upon a specific set of pitches. As the piece progresses, the melody may stray from this foundation of tones, but never too far and not for too long. This is what musicians refer to as tonality.⁹ Hanon’s exercises are centered on the consonant fundamental chord of C-

Major, that is, the notes C, E, and G. Therefore, in constructing our model we need a condition that will guarantee a consonant sound as well as maintain the tonality of the C-Major chord.

In the world of composition, there are no hard and fast rules for establishing tonality. However, one rule of thumb is that the first and last notes of a piece must be of the fundamental pitches upon which the composition is based. Musicians refer to these as “chord tones,” and to all other notes as “non-chord tones.”⁷ The exercises

in our model consist solely of the five musical notes C, D, E, F, and G. The notes C, E, and G are the chord tones, and D and F the non-chord tones. To mimic the tonality of Hanon in our model, we insist that each exercise begins on C and that no more than two non-chord tones appear consecutively. This seems to be one of the guidelines Hanon used to establish tonality in exercises 1 through 20 (excepting number 6).

With the above goals in mind, we formulate the model assumptions. It is sufficient to describe the pattern for only the first measure of an exercise, since this measure determines the entire exercise. The pattern requirements for each exercise follow:

- i. The pattern consists of eight tones.
- ii. We consider only “five-finger” patterns.

That is, the thumb remains on C, the first finger on D, second finger on E, third finger on F, and the fourth finger on G throughout the pattern. This assumption simplifies the counting.

iii. No note appears consecutively in the pattern. Hanon’s exercises in Part I satisfy this condition. Presumably this allows the exercises to be played more fluidly.

iv. Each finger needs to play at least once. Equivalently, each of the notes C, D, E, F, and G must appear in the pattern at least once. In this way, each finger is exercised. Hanon’s Part I exercises satisfy this condition as well.

v. The pattern starts on C and ends on either an E or an F. This assumption helps establish the tonality of the exercise and ensures a smooth transition between measures. In order to develop speed, dexterity, and agility, the pianist must be able to move easily between measures, playing as continuously as possible to maximize effort. Ending on a C or D would hinder the ascending motion of the piece. Additionally, this assumption simplifies the counting.

vi. At most two non-chord tones appear consecutively. This condition attempts to maintain tonality.

At this point then, we can utilize assumptions i through vi to generate piano exercises that are similar to Hanon’s. The exercises produced from the model essentially differ from those of Hanon’s only in that they are based upon five notes of the C-major scale, whereas Hanon’s exercises are based upon six.

Enumeration

We next address the issue of counting the total possible number of exercises that can be produced from the model. To this end, the counting is simplified by separating the various main patterns into the following individual cases:

A) The pattern consists of one pair of

consecutive non-chord tones and six chord tones.

B) The pattern consists of one pair of consecutive non-chord tones, one single non-chord tone, and five chord tones.

C) The pattern consists of one pair of consecutive non-chord tones, two single non-chord tones, and four chord tones.

D) The pattern consists of two single non-chord tones and six chord tones. (Note: a pattern consisting of only one single non-chord tone would violate assumption iv).

E) The pattern consists of three or four single non-chord tones, and the remaining are chord tones.

F) The pattern consists of two pairs of non-chord tones and four chord tones.

G) The pattern consists of two pairs of non-chord tones, one single non-chord tone, and three chord tones.

Because the enumeration is unique to each case, to compute the total possible number of exercises we must separately consider each. To illustrate how the computations take place, we detail the calculation for Case C. There are 12 different configurations in which one pair of non-chord tones, two single non-chord tones, and four chord tones occur. Let \bar{C} represent a chord tone (that is, a C, E, or G) and N represent a non-chord tone (a D or F). The possible configurations in Case C then are the following:

1. $CNN\bar{C}N\bar{C}NE$
2. $CNN\bar{C}N\bar{C}\bar{C}F$
3. $CNN\bar{C}\bar{C}N\bar{C}\bar{F}$
4. $\bar{C}\bar{C}NN\bar{C}N\bar{C}\bar{F}$
5. $CN\bar{C}NN\bar{C}NE$
6. $CN\bar{C}NN\bar{C}\bar{C}F$
7. $CN\bar{C}\bar{C}NN\bar{C}\bar{F}$
8. $\bar{C}\bar{C}N\bar{C}NN\bar{C}\bar{F}$
9. $CN\bar{C}N\bar{C}NNE$
10. $CN\bar{C}N\bar{C}\bar{C}NF$
11. $CN\bar{C}\bar{C}N\bar{C}NF$
12. $\bar{C}\bar{C}N\bar{C}N\bar{C}NF$

Note that the above configurations satisfy assumption v, which states that the pattern begins on C and ends on an E or F.

There are various approaches to counting the total number of patterns in each of these configurations. The method that we found to be most efficient is to multiply the possible number of non-chord tone combinations by the possible number of chord tone combinations, all the while enforcing assumptions i through vi. The most problematic aspect of this is ensuring that each note appears at least once in the pattern. This counting method uses ideas from the mathematical field of combinatorics, the study of enumeration of various sets of objects. In particular, we use the Multiplication

Principle which states that if one object can be selected in p different ways, and a second object can be selected in q different ways, where p and q are positive integers, then a choice of both the first and second object can be made in $p \times q$ different ways.¹⁰ For example, an octave contains 12 notes, so the number of two-note patterns that can be formed from the notes of an octave is $12 \times 12 = 144$. The Multiplication Principle extends to selecting multiple objects. Applying the Multiplication Principle in this way to count the number of exercises our model can generate by using only assumptions i and ii yields $5 \cdot 5 \cdot 5 \cdot 5 \cdot 5 \cdot 5 = 5^6 = 15,625$ —an impressive number.

As an illustration of the counting procedure, consider the following calculation that yields the number of patterns for Configuration 1,

$$\begin{aligned}
 & \left(\begin{array}{c} \text{total number} \\ \text{of patterns that} \\ \text{satisfy assumptions} \end{array} \right) = \\
 & \left(\begin{array}{c} \text{number of} \\ \text{non-chord tone} \\ \text{combinations} \end{array} \right) \times \left(\begin{array}{c} \text{number of} \\ \text{of chord tone} \\ \text{combinations} \end{array} \right) = \\
 & \left[\left(\begin{array}{c} \text{number of} \\ \text{paired} \\ \text{non-chord tones} \end{array} \right) \times \left(\begin{array}{c} \text{number of} \\ \text{single} \\ \text{non-chord tones} \end{array} \right) \right] \times \\
 & \left[\left(\begin{array}{c} \text{number of} \\ \text{single} \\ \text{non-chord tones} \end{array} \right) \right] \times \left[\left(\begin{array}{c} \text{number of} \\ \text{single} \\ \text{chord tones} \end{array} \right) \times \right. \\
 & \left. \left(\begin{array}{c} \text{number of} \\ \text{single} \\ \text{chord tones} \end{array} \right) - \left(\begin{array}{c} \text{number of} \\ \text{paired chord tones} \\ \text{without a G} \end{array} \right) \right] \\
 & = (2 \cdot 1 \times 2 \times 2) \times (3 \times 3 - 2 \times 2) = (2^3) \times (3^2 - 2^2) \\
 & = 8 \times 5 = 40
 \end{aligned}$$

If a pair of non-chord tones appears, then the pattern contains both a D and an F, since notes cannot occur consecutively (assumption iii). Subtracting the possible number of paired chord tones that do not contain a G from the total number of chord tone combinations forces a G to appear in the pattern. This is known in combinatorics as an inclusion-exclusion principle.¹¹ In this way, the pattern satisfies all of the model assumptions. Figure 2 presents several first measures of exercise that arise from Configuration 1 of Case C.

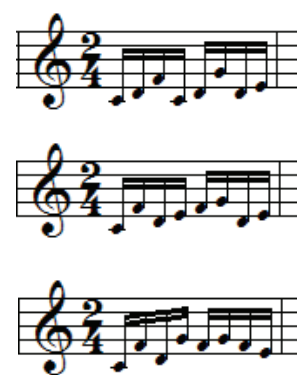


Figure 2. Examples of basic patterns generated from Configuration 1 of Case C that satisfy the model assumptions. The first pattern consists of the notes C-D-F-C-D-G-D-E, the second C-F-D-E-F-G-D-E, and the third C-F-D-G-F-G-F-E. (This figure was created using NoteWorthy Composer Software).

The remaining configurations of Case C are counted in a similar fashion. The results are presented in Table 1.

When counting, we can take advantage of some obvious symmetry in the configurations. For example, it is easy to see that Configurations 1 and 9 of Case C are symmetric. For the sake of completion however, we will present results for each possible configuration.

Since the computations for the remaining cases are similar, we briefly summarize them in the following tables. Again, we comment that the operation of subtraction in the number of non-chord tone combinations eliminates those in which every note does not appear, thus enforcing assumption iv. On occasion, a combination is subtracted twice and needs to be added back in for accuracy, as in Case G.

| Case C) | | |
|---|---|--------------------------|
| Configuration | (Number of Non-Chord Tone Combinations) × (Number of Chord Tone Combinations) | Total Number of Patterns |
| $CNN\bar{C}N\bar{C}NE$ | $(2^3) \times (3^2 - 2^2)$ | 40 |
| $CNN\bar{C}N\bar{C}CF$ | $(2^2) \times (3^2 \cdot 2 - 2^2 - 2^2)$ | 40 |
| $CNN\bar{C}CN\bar{C}F$ | $(2^2) \times (3 \cdot 2 \cdot 3 - 2^2 - 2^2)$ | 40 |
| $\bar{C}CNN\bar{C}N\bar{C}F$ | $(2^2) \times (2 \cdot 3^2 - 2^2 - 2^2)$ | 40 |
| $CN\bar{C}NN\bar{C}NE$ | $(2^3) \times (3^2 - 2^2)$ | 40 |
| $CN\bar{C}NN\bar{C}CF$ | $(2^2) \times (3^2 \cdot 2 - 2^2 - 2^2)$ | 40 |
| $CN\bar{C}CN\bar{C}F$ | $(2^2) \times (3 \cdot 2 \cdot 3 - 2^2 - 2^2)$ | 40 |
| $\bar{C}\bar{C}N\bar{C}NN\bar{C}F$ | $(2^2) \times (2 \cdot 3^2 - 2^2 - 2^2)$ | 40 |
| $CN\bar{C}N\bar{C}NNE$ | $(2^3) \times (3^2 - 2^2)$ | 40 |
| $CN\bar{C}N\bar{C}N\bar{C}F$ | $(2^2) \times (3^2 \cdot 2 - 2^2 - 2^2)$ | 40 |
| $CN\bar{C}CN\bar{C}N\bar{C}F$ | $(2^2) \times (3 \cdot 2 \cdot 3 - 2^2 - 2^2)$ | 40 |
| $\bar{C}\bar{C}N\bar{C}N\bar{C}N\bar{C}F$ | $(2^2) \times (2 \cdot 3^2 - 2^2 - 2^2)$ | 40 |

Table 1. Pattern counts for Case C configurations (one pair of consecutive non-chord tones, two single non-chord tones, and four chord tones)

| Case A) | | |
|--|---|--------------------------|
| Configuration | (Number of Non-Chord Tone Combinations) × (Number of Chord Tone Combinations) | Total Number of Patterns |
| $CNN\bar{C}\bar{C}\bar{C}\bar{C}E$ | $(2) \times (2^4 - 1)$ | 30 |
| $\bar{C}\bar{C}NN\bar{C}\bar{C}\bar{C}E$ | $(2) \times (2^4 - 1)$ | 30 |
| $\bar{C}\bar{C}\bar{C}NN\bar{C}\bar{C}E$ | $(2) \times (2^4 - 1)$ | 30 |
| $\bar{C}\bar{C}\bar{C}\bar{C}NN\bar{C}E$ | $(2) \times (2^4 - 1)$ | 30 |
| $\bar{C}\bar{C}\bar{C}\bar{C}\bar{C}NNE$ | $(2) \times (2^4 - 1)$ | 30 |
| $\bar{C}\bar{C}\bar{C}\bar{C}\bar{C}N\bar{C}F$ | $(1) \times (2^5 - 1 - 1)$ | 30 |

Table 2. Pattern counts for Case A configurations (one pair of consecutive non-chord tones and six chord tones)

| Case B) | | |
|---|---|--------------------------|
| Configuration | (Number of Non-Chord Tone Combinations) × (Number of Chord Tone Combinations) | Total Number of Patterns |
| $CNN\bar{C}N\bar{C}\bar{C}E$ | $(2^2) \times (3 \cdot 2^2 - 2)$ | 40 |
| $CNN\bar{C}CN\bar{C}E$ | $(2^2) \times (3 \cdot 2^2 - 2)$ | 40 |
| $CNN\bar{C}\bar{C}\bar{C}NE$ | $(2^2) \times (3 \cdot 2^2 - 2)$ | 40 |
| $CNN\bar{C}\bar{C}\bar{C}CF$ | $(2) \times (3 \cdot 2^3 - 2 - 2)$ | 40 |
| $\bar{C}\bar{C}NN\bar{C}N\bar{C}E$ | $(2^2) \times (2 \cdot 3 \cdot 2 - 2)$ | 40 |
| $\bar{C}\bar{C}NN\bar{C}\bar{C}NE$ | $(2^2) \times (2 \cdot 3 \cdot 2 - 2)$ | 40 |
| $\bar{C}\bar{C}NN\bar{C}\bar{C}CF$ | $(2) \times (2 \cdot 3 \cdot 2^2 - 2 - 2)$ | 40 |
| $\bar{C}\bar{C}\bar{C}NN\bar{C}NE$ | $(2^2) \times (2^2 \cdot 3 - 2)$ | 40 |
| $\bar{C}\bar{C}\bar{C}NN\bar{C}CF$ | $(2) \times (2^2 \cdot 3 \cdot 2 - 2 - 2)$ | 40 |
| $\bar{C}\bar{C}\bar{C}\bar{C}NN\bar{C}F$ | $(2) \times (2^3 \cdot 3 - 2 - 2)$ | 40 |
| $CN\bar{C}NN\bar{C}\bar{C}E$ | $(2^2) \times (3 \cdot 2^2 - 2)$ | 40 |
| $CN\bar{C}CN\bar{C}N\bar{C}E$ | $(2^2) \times (3 \cdot 2 \cdot 2 - 2)$ | 40 |
| $CN\bar{C}\bar{C}\bar{C}NNE$ | $(2^2) \times (3 \cdot 2^2 - 2)$ | 40 |
| $CN\bar{C}\bar{C}\bar{C}CN\bar{C}F$ | $(2) \times (3 \cdot 2^3 - 2 - 2)$ | 40 |
| $\bar{C}\bar{C}N\bar{C}NN\bar{C}E$ | $(2^2) \times (2 \cdot 3 \cdot 2 - 2)$ | 40 |
| $\bar{C}\bar{C}N\bar{C}\bar{C}NNE$ | $(2^2) \times (2 \cdot 3 \cdot 2 - 2)$ | 40 |
| $\bar{C}\bar{C}N\bar{C}\bar{C}CN\bar{C}F$ | $(2) \times (2 \cdot 3 \cdot 2^2 - 2 - 2)$ | 40 |
| $\bar{C}\bar{C}\bar{C}N\bar{C}NNE$ | $(2^2) \times (2^2 \cdot 3 - 2)$ | 40 |
| $\bar{C}\bar{C}\bar{C}N\bar{C}CN\bar{C}F$ | $(2) \times (2^2 \cdot 3 \cdot 2 - 2 - 2)$ | 40 |
| $\bar{C}\bar{C}\bar{C}\bar{C}N\bar{C}N\bar{C}F$ | $(2) \times (2^3 \cdot 3 - 2 - 2)$ | 40 |

Table 3. Pattern counts for Case B configurations (one pair of consecutive non-chord tones, one single non-chord tone, and five chord tones)

| Case D) | | |
|--|---|--------------------------|
| Configuration | (Number of Non-Chord Tone Combinations) × (Number of Chord Tone Combinations) | Total Number of Patterns |
| $CN\bar{C}N\bar{C}\bar{C}\bar{C}E$ | $(2^2 - 1 - 1) \times (3 \cdot 2^3 - 2)$ | 44 |
| $CN\bar{C}\bar{C}\bar{C}N\bar{C}E$ | $(2^2 - 1 - 1) \times (3 \cdot 2^3 - 2)$ | 44 |
| $CN\bar{C}\bar{C}\bar{C}\bar{C}N\bar{C}E$ | $(2^2 - 1 - 1) \times (3 \cdot 2^3 - 2)$ | 44 |
| $CN\bar{C}\bar{C}\bar{C}\bar{C}NE$ | $(2^2 - 1 - 1) \times (3 \cdot 2^3 - 2)$ | 44 |
| $CN\bar{C}\bar{C}\bar{C}\bar{C}CF$ | $(2 - 1) \times (3 \cdot 2^4 - 2 - 2)$ | 44 |
| $\bar{C}\bar{C}N\bar{C}N\bar{C}\bar{C}E$ | $(2^2 - 1 - 1) \times (2 \cdot 3^2 \cdot 2 - 2)$ | 44 |
| $\bar{C}\bar{C}N\bar{C}\bar{C}N\bar{C}E$ | $(2^2 - 1 - 1) \times (2 \cdot 3 \cdot 2^2 - 2)$ | 44 |
| $\bar{C}\bar{C}N\bar{C}\bar{C}\bar{C}NE$ | $(2^2 - 1 - 1) \times (2 \cdot 3 \cdot 2^2 - 2)$ | 44 |
| $\bar{C}\bar{C}N\bar{C}\bar{C}\bar{C}CF$ | $(2 - 1) \times (2 \cdot 3 \cdot 2^3 - 2 - 2)$ | 44 |
| $\bar{C}\bar{C}\bar{C}N\bar{C}N\bar{C}E$ | $(2^2 - 1 - 1) \times (2^2 \cdot 3 \cdot 2 - 2)$ | 44 |
| $\bar{C}\bar{C}\bar{C}N\bar{C}\bar{C}NE$ | $(2^2 - 1 - 1) \times (2^2 \cdot 3 \cdot 2 - 2)$ | 44 |
| $\bar{C}\bar{C}\bar{C}N\bar{C}\bar{C}CF$ | $(2 - 1) \times (2^3 \cdot 3 \cdot 2 - 2 - 2)$ | 44 |
| $\bar{C}\bar{C}\bar{C}\bar{C}N\bar{C}NE$ | $(2^2 - 1 - 1) \times (2^3 \cdot 3 - 2)$ | 44 |
| $\bar{C}\bar{C}\bar{C}\bar{C}N\bar{C}CF$ | $(2 - 1) \times (2^2 \cdot 3 \cdot 2 - 2 - 2)$ | 44 |
| $\bar{C}\bar{C}\bar{C}\bar{C}\bar{C}N\bar{C}F$ | $(2 - 1) \times (2^4 \cdot 3 - 2 - 2)$ | 44 |

Table 4. Pattern counts for Case D configurations (two single non-chord tones and six chord tones)

| Case E) | | |
|---------------|--|--------------------------|
| Configuration | (Number of Non-Chord Tone Combinations) × (Number of Chord Tone Combinations) | Total Number of Patterns |
| CNC̄NC̄NC̄F | $\frac{(2^3-1) \times (3^3-2^3-2^3+1)}{(3^3-2^3-2^3+1)}$ | 84 |
| CNC̄NC̄NC̄E | $\frac{(2^3-1-1) \times (3^2 \cdot 2-2^2)}{(3^2 \cdot 2-2^2)}$ | 84 |
| CNC̄NC̄NC̄NE | $\frac{(2^3-1-1) \times (3^2 \cdot 2-2^2)}{(3^2 \cdot 2-2^2)}$ | 84 |
| CNC̄NC̄NC̄CF | $\frac{(2^2-1) \times (3^3-2^2-2^2-2^2)}{(3^3-2^2-2^2-2^2)}$ | 84 |
| CNC̄NC̄NC̄NE | $\frac{(2^3-1-1) \times (3 \cdot 2 \cdot 3-2^2)}{(3 \cdot 2 \cdot 3-2^2)}$ | 84 |
| CNC̄NC̄NC̄CF | $\frac{(2^2-1) \times (3 \cdot 2 \cdot 3 \cdot 2-2^2-2^2)}{(3 \cdot 2 \cdot 3 \cdot 2-2^2-2^2)}$ | 84 |
| CNC̄NC̄NC̄CF | $\frac{(2^2-1) \times (3 \cdot 2^2 \cdot 3-2^2-2^2)}{(3 \cdot 2^2 \cdot 3-2^2-2^2)}$ | 84 |
| C̄C̄NC̄NC̄NE | $\frac{(2^3-1-1) \times (2 \cdot 3^2-2^2)}{(2 \cdot 3^2-2^2)}$ | 84 |
| C̄C̄NC̄NC̄CF | $\frac{(2^2-1) \times (2 \cdot 3^2 \cdot 2-2^2-2^2)}{(2 \cdot 3^2 \cdot 2-2^2-2^2)}$ | 84 |
| C̄C̄NC̄NC̄CF | $\frac{(2^2-1) \times (2 \cdot 3 \cdot 2 \cdot 3-2^2-2^2)}{(2 \cdot 3 \cdot 2 \cdot 3-2^2-2^2)}$ | 84 |
| C̄C̄C̄NC̄NC̄F | $\frac{(2^2-1) \times (2^2 \cdot 3^2-2^2-2^2)}{(2^2 \cdot 3^2-2^2-2^2)}$ | 44 |

Table 5. Pattern counts for Case E configurations (three or four single non-chord tones and four or five chord tones, respectively)

| Case F) | | |
|---------------|---|--------------------------|
| Configuration | (Number of Non-Chord Tone Combinations) × (Number of Chord Tone Combinations) | Total Number of Patterns |
| CNN̄C̄NN̄E | $(2^2) \times (3 \cdot 2-2)$ | 16 |
| CNN̄C̄NN̄E | $(2^2) \times (3 \cdot 2-2)$ | 16 |
| CNN̄C̄C̄NF | $(2) \times (3 \cdot 2^2-2-2)$ | 16 |
| C̄C̄NN̄C̄NN̄E | $(2^2) \times (2 \cdot 3-2)$ | 16 |
| C̄C̄NN̄C̄C̄NF | $(2) \times (2 \cdot 3 \cdot 2-2-2)$ | 16 |
| C̄C̄C̄NN̄C̄NF | $(2) \times (2^2 \cdot 3-2-2)$ | 16 |

Table 6. Pattern counts for Case F configurations (two pairs of non-chord tones and four chord tones)

| Case G) | | |
|---------------|---|--------------------------|
| Configuration | (Number of Non-Chord Tone Combinations) × (Number of Chord Tone Combinations) | Total Number of Patterns |
| CNN̄C̄NN̄CF | $\frac{(2^2) \times (3^2-2^2-2^2+1)}{(3^2-2^2-2^2+1)}$ | 8 |
| CNN̄C̄C̄NF | $\frac{(2^2) \times (3^2-2^2-2^2+1)}{(3^2-2^2-2^2+1)}$ | 8 |
| C̄NC̄NN̄C̄NF | $\frac{(2^2) \times (3^2-2^2-2^2+1)}{(3^2-2^2-2^2+1)}$ | 8 |

Table 7. Pattern counts for Case G configurations (two pairs of non-chord tones, one single non-chord tone, and three chord tones)

Summary

We have presented a mathematical analysis of some simple five-finger exercises for the pianist. The exercises are generated from a formulaic model we constructed, inspired by the celebrated exercises of the 19th century composer Charles-Louis Hanon. The model's exercises are similar to Hanon's, but easier to analyze. In this way, we were able to enumerate the total number of possible exercises that can be generated from our model using mathematics at the undergraduate level. All told, there are 3,164 different five-finger exercises that can be generated from our model—a remarkable number of possible compositions given the restrictions and limited number of notes used in the model. The enumeration provides an application of mathematics to music theory and an insight into the mathematics required to analyze music at a higher level.

Additionally, the result of the computation gives an appreciation for the vast number of potential piano compositions, considering that compositions have no restrictions. Many notes can be played at same time, notes can be sustained for various durations, and the piece can be of any length and based upon different sets of pitches that can change at any time during the work.

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Recognizing cultural dysthymia: The implications of including discrimination- mediated mental illnesses in the *Diagnostic and Statistical Manual of Mental Disorders*

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Abstract

Cultural dysthymia is a form of persistent depressive disorder (PDD; dysthymia) that is precipitated and exacerbated by racial discrimination.^{2,3,21} Symptoms include chronic depressed mood and anger or hostility, especially when in interpersonal conflicts with a member of a privileged group. Racism is a known stressor that precipitates and exacerbates mental illness in those targeted; however, the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) does not officially recognize disorders arising from discrimination. Cultural dysthymia is mainly applied to African Americans, but can be applied to other racially oppressed groups. This paper will address how stress affects mental and physical health, including factors that lead to development of this condition, categorizing cultural dysthymia in the DSM as to yield the most accurate and beneficial results, and some implications of this diagnosis being officially recognized by the DSM. Tangible future steps to improve adequacy of care for disadvantaged groups will be presented.

Introduction

Racism and poverty are two major stressors that are known to negatively impact mental and physical health.^{2,9} Currently, there is little mention of these two stressors as precipitators of mental illness in the *Diagnostic and Statistical Manual of Mental Disorders (DSM-5)*. At the end of the *DSM-5* under the “Other Conditions” section, poverty- and discrimination-induced mental stress appear.¹ However, these are not included in the main areas of the *DSM-5* as legitimate causes of mental illness, leaving many people misdiagnosed and undertreated. The “Other Conditions” is meant to give context to possible factors leading to the development of mental illness, however, there is also a section titled “Conditions for Further Study”. In this section, there are several proposed conditions complete with accompanying symptoms, etiology, prevalence, and comorbidity. A condition such as cultural dysthymia could be placed here where it can be thoroughly detailed, instead of having a few sentences in the “Other Conditions” section.

Though poverty and discrimination are included as possible stressors and precipitators of mental disorders, the language surrounding these risk factors is problematic; discrimination is described as “perceived” instead of “experienced”. This invalidates the lived experiences of people facing discrimination – which does not have

to be validated by someone not experiencing that discrimination, nor does it have to be deliberate or overt discrimination in order to be legitimate. By calling discrimination “perceived”, it puts the onus on the receiver for supposedly having the “wrong” perception and outlook on life.

All residents of a country do not share the same culture, regardless of a supposed shared national culture and identity. Ethnicity and socioeconomic status are two of many factors that influence the way people live, and mental health professionals are supposed to view symptoms with cultural awareness. Without this awareness, it is ignored that many mental illnesses have factors directly stemming from societal discrimination. Among African Americans, racism has been identified as the number one most prevalent and most potent cause of psychological distress.³ Since racism and poverty are inextricably linked¹⁶, African Americans experience more than just “pure” race-based discrimination; being Black in America precipitates and exacerbates mental illness. Cultural dysthymia is a form of persistent depressive disorder (PDD; dysthymia) that is precipitated and exacerbated by racial discrimination.^{3,4} Symptoms include chronic depressed mood and anger or hostility, especially when in interpersonal conflicts with a member of a privileged group.⁴ Although the condition is primarily applied to African Americans, it is applicable to

a range of ethnic groups that experience historic and contemporary oppression and discrimination resulting from colonization. As a result of centuries of enslavement, dehumanization, and deliberate social exclusion and inhibition, these stressors have negative and lasting impacts on the mental and physical health of those targeted. Cultural awareness, and respect for underprivileged groups, in therapeutic settings is necessary to provide more adequate and appropriate care. These cannot stem from interpersonal interactions between health providers and patients; systemic incorporation of the ways in which discrimination impact mental health is necessary. Including cultural dysthymia in the *DSM-5* would lead to better treatment outcomes and greater attention to combating the intersectional factors that cause cultural dysthymia. While this paper is focusing specifically on Black American populations, racism has negative effects on the mental health of other ethnic minority groups as well.

Racism as Stress and its Effects on Mental and Physical Health

It is known that stress precipitates and exacerbates many health conditions.¹⁶ Overall health on average decreases (including increases of early mortality and morbidity) as one decreases along the socioeconomic scale.⁶ To a certain degree the body is able to adapt to changes caused

by stress; the ability to maintain homeostasis through change is called allostasis.⁶ The amygdala and hippocampus are involved in fear learning and conditioning and play an important role in the response to instances of stress (in this case, the stress is racism); they, along with other brain structures, form a “network”. With trauma, it is believed that amygdala-based fear completely circumvents the hippocampus (which is important for memory and learning), leading to somatic and physiological effects when presented with the same or similar stimuli; this recreates the negative experience of being introduced to the stimuli for the first time. Each time the body has to remedy an unbalance it is referred to as an allostatic cycle.^{5,6,27} Allostatic load describes the “wear and tear the body experiences due to repeated cycles of allostasis” and stress from having to repeatedly start and stop these cycles.⁶ Stress disrupts physiological homeostasis, and the body must have sufficient ability to remedy this (allostasis); although the body may return to homeostasis, there exists a gradual deterioration of overall health due to the build-up of stressful incidents (allostatic load).

Stress is a broad term that can be applied to a multitude of entities. In terms of social stress, it is very subjective: what is a stressor to one person may not be a stressor to another. Sometimes, as is the case with racism and sexism, only segments of a population experience a specific stressor. Discriminatory stressors, such as race- or sexual orientation-based, have compounding effects, often because a person can identify with one or more marginalized identity. For instance, a woman would experience systemic gender discrimination, but an ethnic minority woman would also face systemic racial discrimination whereas a woman of the dominant racial group would not. Dr. Kimberlé Crenshaw defined this phenomenon as intersectionality, the inextricably linked manner in which systems of oppression and discrimination operate.⁸ Discrimination is a prominent social stressor that is detrimental to psychological and physical health. From a biopsychosocial viewpoint, cultural dysthymia has a complex etiology involving multiple interconnected factors.

Psychological stress

Discrimination is a stressor that is significant in the lives of those who experience it. For African Americans, the most prevalent and potent stressor is racism.²⁷ On average, racism causes Black Americans to experience greater overall psychological distress and decreased mastery (skills performance).⁹ Interpersonal racism

has been shown to have many negative health effects.^{3,10,11} Institutional racism, which affects economic status and education for example, also has negative effects on physical and mental health. Among Black inner-city residents, there are higher rates of suicide (including attempts), post-traumatic stress disorder (PTSD), emotional instability, depression, and substance dependence.^{12,13,14} It has been found that PTSD rates within impoverished communities in inner cities rival that of returning military veterans, even after controlling for other factors.¹⁵ “Racism operates within objective life conditions, popular culture, and religious and educational institutions”.¹⁶ Because of the covert pervasiveness of institutional racism, Black Americans often can better point to specific, isolated instances of interpersonal racism. Racism is also sustained by implicit biases, which are stereotypes that, unknown to ourselves, affect our thoughts and actions. These racist incidents, both institutional and interpersonal, increase allostatic load and have detrimental effects on psychological health.

Physical stress

Institutional racism negatively impacts physical health. Disparities in rates of disease between White and Black Americans can be attributed to historical and social inequality.^{10,11,17} Because poverty and race are inextricably linked, the negative health effects from living in poverty are compounded with the negative health effects of racism; those in the cycle of poverty tend to only be aware of scarcity of their resources and not about how their gender and/or race play a role in their situation. Even when socioeconomic status is relatively equal between races, African Americans still experience higher rates of disease.¹⁷ African American women (largely slave-descendant) experience higher rates of fibroids than White women, which can in part be attributed to early medical experimentation on female slaves by J. Marion Sims, whose work helped found the field of gynecology.¹⁸ There is a plethora of instances of historic and contemporary medical experimentation on usually poor and under-educated Black Americans, sometimes funded by the United States government.^{19,20,21} This grim reality also negatively impacts psychological health; being faced with the prospects of a higher likelihood of poor health outcomes is a source of stress.

Categorizing Cultural Dysthymia in the DSM-5

If cultural dysthymia were to be included in the *DSM* it would most likely be placed under an existing category. Depressive

disorders and trauma- and stressor-related disorders are the two diagnostic categories most relevant to cultural dysthymia. The specific classification of cultural dysthymia does matter, and after analyzing both categories for fit, it was determined that cultural dysthymia would be best suited in a new, distinct category.

Depressive disorders

The *DSM-5* defines persistent depressive disorder (PDD; dysthymia) as “a depressed mood that occurs for most of the day, for more days than not, for at least 2 years, or at least 1 year for children and adolescents”.²² Sometimes PDD is characterized as a low-grade, chronic depression. The major distinguishing factors are four symptoms often present in major depressive disorder (MDD) that are absent in PDD: near daily psychomotor agitation or retardation, suicidal thoughts and actions, anhedonia, and feelings of worthlessness or excessive guilt.²² Other symptoms of PDD include abnormal sleep, feelings of hopelessness, poor concentration, appetite changes or disturbances, low self-esteem, and low energy or fatigue.²²

The only environmental risk factor for PDD listed in the *DSM* is parental loss or separation during childhood.²³ Genetic and physiological risk factors do not differ from those of major depressive disorder (MDD).²²

Trauma- and stressor-related disorders.

The *DSM-5* defines trauma- and stressor-related disorders as disorders in which the main criterion for diagnosis is a traumatic or stressful event(s).²⁴ The disorders included under this umbrella are: reactive attachment disorder, disinhibited social engagement disorder, post-traumatic stress disorder, acute stress disorder, adjustment disorders, and other and unspecified trauma- and stressor-related disorders.²⁴

Several environmental, pre-traumatic (before onset) risk factors of PTSD most directly related to cultural dysthymia are: “lower socioeconomic status; lower education; exposure to prior trauma (especially during childhood); childhood adversity (e.g., economic deprivation, family dysfunction, parental separation or death); minority racial/ethnic status; and a family psychiatric history”.²⁴ Although these risk factors are included here in the *DSM-5*, these factors also play large roles in the development of other mental illnesses, such as depression.

Categorizing cultural dysthymia

Given these criteria, it is clear that cultural dysthymia overlaps greatly with both categories. The depressive disorders category

best describes the symptoms of cultural dysthymia whereas the trauma- and stressor-related disorders category encapsulates the triggers. Cultural dysthymia differs from other depressive disorders in that the primary risk factors are racial discrimination-based. While White Americans experience higher rates of depression than African Americans, African Americans experience higher rates of dysthymia.²⁵ Because of the heavy influence of discrimination-based trauma, cultural dysthymia would be best categorized under trauma- and stressor-related disorders instead of depressive disorders. However, there are other unexplored conditions caused by discriminations such as gender-based and sexuality-based discrimination. Those disorders, like cultural dysthymia, share risk factors that have similar mechanisms of action and could potentially have the same symptoms; because of this, they should be classified under a "Discrimination-mediated" category due to their distinct—but often overlapping—primary causes. For many people, these three areas—race, gender, and sexuality—overlap. There are more interactions between risk factors for these people, and the symptoms are magnified. A separate classification category, complete with uniquely modified treatment options, would best suit people experiencing cultural dysthymia. Although there have been many changes over the years, the *DSM-5* groups disorders by common characteristics such as symptoms and risk factors. While there is much overlap between cultural dysthymia, depressive disorders, and trauma- and stressor-related disorders, a separate category for discrimination-precipitated disorders would follow *DSM-5* structure and be most beneficial.

Importance of accurate classification

The categorization of cultural dysthymia is important because of the current general methodology of *DSM* classifications; classification is often an indicator of beneficial treatment options. Per classification group, there are similar stressors and treatments across disorders. A treatment for one disorder can be more beneficial for a patient with a related disorder than the recommended treatment for their specific condition. Thus, it is most beneficial for patients for cultural dysthymia to be classified in the most relevant category.

Implications and Future Steps

Overwhelming evidence of racism's detrimental effects on mental health indicates it is imperative that discrimination-mediated mental disorders be included in the *DSM*. Although dysthymia and MDD have great overlap in symptoms, etiology,

and treatment, there are differences that make certain treatments better for the latter condition than the former. For example, a combination of drug therapy and psychotherapy may be more appropriate for MDD, whereas dysthymia may only require psychotherapy. With cultural dysthymia, there are environmental factors that need to be accounted for when assessing patients for diagnosis and conceptualizing treatment. Healthcare professionals must be aware of cultural factors that influence mental health – especially when a patient and professional do not share cultures – the professional must be acutely aware of how gender, race, and class affect mental health. This is important because it affords the provider a more holistic view of the condition and can inform the provider as to the best course of treatment. Treatments geared towards identifying, understanding, and coping with these unique stressors are necessary in order to provide adequate care. For example, schools of social work across the country offer comprehensive courses and programs in diversity and discrimination education so professionals are as equipped as possible to serve diverse groups of disadvantaged populations. The social work profession was founded based on principals of social justice, and this foundation sets these programs apart from other medical professions that later added these components to their training. The issue is not simply a lack of training for future providers, but the disconnect between taking one cultural sensitivity course in school and making that an integral part of an individual's professional praxis. The dilemma is that these environmental factors are vast and pervasive social problems that cannot be escaped; cultural dysthymia would not exist if racial discrimination also did not exist.

If cultural dysthymia were to be recognized in the *DSM*, it would have great implications for society. Although there exists extensive research on racism as a major stressor, societal changes are slow and often stagnant.^{8,9,10,11,13} Racial power dynamics in America put African Americans and other non-White people beneath White Americans. Racism exists as an institution in which, fueled by societal power dynamics with historical roots, ethnic groups are stratified by arbitrarily defined and supposedly inherent measures of value, and are disadvantaged accordingly. Those in power, even if they are aware of these effects and are combating them, also hold implicit and explicit racial, class, and gender biases that affect their actions and worldview.

Many cities and towns across America are racially segregated, even if there exist significant populations of different racial groups.²⁶ It has been shown that lack of early

childhood introduction to racially diverse groups (outgroup members) is strongly correlated with heightened amygdala-based responses later in life when in contact with those outgroup members.²⁷ The amygdala become active when presented with new stimuli, which is an evolutionary defense mechanism. With repeated exposure, the stimuli are conditioned, or coded, loosely as "safe" or "unsafe"; with conditioning, the amygdala will respond less to "safe" stimuli. How, then, can a health professional raised in a homogenous environment with little to no contact with other racial group members begin to understand and recognize the significant effects racism has on certain groups of people? What are patients supposed to do when they need psychiatric help, but the vast majority of available professionals are members of a privileged class who are complicit in institutional discrimination? This presents a problem for racially oppressed groups, who report discrimination, apathy, and subpar treatment from medical professionals and other authority figures across fields.^{28,29,30}

Possible future steps

There are many actions that can be taken to improve the adequacy of mental health care for members of disadvantaged groups. Oppression awareness programs that exist in social work schools can be implemented in other health professional schools on a wider scale. Health professionals at all levels should be required to have this comprehensive level of discrimination education in order to obtain a license to practice. For residents in poorer neighborhoods, there is a shortage of funding that directly impacts the quality of care and resources available to them. Better allocation of monetary resources, especially for public community health centers, would greatly benefit residents of those neighborhoods. Diversity of staff in multiple areas – such as gender, language, race and ethnicity, socioeconomic background, ability, and sexual orientation – would allow for patients to seek treatment from providers who share common background and experiences. This is vital for care, because often times people are deterred from seeking medical care due to a lack of professionals who look – literally and figuratively – like them. The problem is circular because marginalized people are also deterred from entering fields that are dominated by privileged majority groups. These are only a few of a myriad of avenues on the path to improving mental health care.

Impacts on other Discrimination-mediated Mental Illnesses

If cultural dysthymia were to be recognized by the *DSM*, more mental

illnesses catalyzed by discrimination would be recognized as well. Often times in health research, those who are being studied are left out of the process. Epidemiology of diseases is only one component; the experiences and criticisms from patients are important as well. Health professionals and researchers need to be receptive to criticisms of their field, actions, and beliefs in order to benefit disadvantaged populations. It is also critical for members of disadvantaged groups to be health professionals, researchers, and other authority figures in order to be available for disadvantaged group members seeking help; knowledge and awareness have limitations and cannot replace lived experiences. As mentioned previously, groups become underrepresented in fields that are dominated by privileged majority groups due to discrimination and unaccommodating environments; in the sciences especially, there are histories of experimentation on minority groups that make minority group members distrustful of the field and those who are a part of it.^{20,21,32,33}

This would have beneficial effects for many groups of people, provided that health care providers are informed and aware of discrimination, as well as their own implicit biases. When aware of biases, providers can take extra steps to assure their patients are being assessed against equitable measures. One issue with this in the medical field is inevitable face-to-face communication, which creates difficulty in assess patients "blindly". However, a double-blind evaluation of patients is possible. Upon arrival for appointments, many health centers already ask patients to fill out a short computer survey before they meet with their provider, rating their emotional wellbeing across numerous measures. A different healthcare provider that does not know the ethnicity of the patient could then evaluate this survey, possibly as part of an oversight committee. The assessment of the patient from their assigned provider and the oversight provider could then be compared, with discrepancies being noted and analyzed. It is important for the survey to be evaluated by someone other than the patient's physician so that the physician does not recognize the patient's verbal answers from their written ones. Financial and time constraints prohibit this kind of intervention from being implemented in high needs areas.

Although extensive research exists on discrimination's effects on mental and physical health, there are substantial improvements to be made.^{8,9,10,11,13} Because the healthcare field does not exist independent of society, changes in the field reflect societal attitudes. Female hysteria and homosexuality are two examples of things

labeled mental illnesses due to discrimination and ignorance that were later retracted, only after much damage to cisgender women and homosexual people.^{30,31,32,33} Including cultural dysthymia and other discrimination-mediated mental illnesses in the *DSM* is a small step toward providing more culturally-sensitive care. Attitudes of health professionals, researchers, and other authority figures also need to change (as well as the demographic makeup of these groups) in order for those seeking care to receive the best care possible.

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Radicalization of politics: Obstructing the Oslo Peace Process

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Abstract

This article examines the radicalization of politics in the 1990s leading up to the al-Aqsa intifada, also known as the Second Intifada. A study of the Palestinian Islamic Jihad Movement, Kach, and Kahane Chai reveals that the violence of these radical groups is not necessarily senseless rebellions against oppression but could instead be seen as calculated efforts to obstruct the peace process, suggesting that unsuccessful negotiations and a subsequent turn to violence are not failures of the peace process but are instead deliberate attempts to undermine it. Understanding the motivation behind acts of terror in Israel and Palestine today and its role in radicalization is crucial in countering terrorism and highlighting the road to peace.

Introduction

A Palestinian uprising called the Intifada began in the 1980s and resulted in the loss of 2,000 Palestinian lives. Those who initiated the uprising viewed it as an act of rebellion against what they saw as a mass repression from the Israeli state. The Madrid Conference and the Oslo Peace Process, both of which were important steps toward peace in Israeli-Palestinian negotiations, came after the Intifada, suggesting that it highlighted the necessity of lasting peace. The progress made in Oslo did not last and the agreements were never fully implemented. In 2000, the Second Intifada was launched. Nicknamed the Al-Aqsa Intifada, this uprising started at the Al-Aqsa Mosque as a direct reaction to then Israeli opposition leader Ariel Sharon visiting the Temple Mount, where the mosque stands. Considered a holy place in both Judaism and Islam, this is also where the Dome of the Rock is found. Although Sharon's visit acted as a catalyst, there are many other underlying reasons for this Intifada, some of which will be explored in this article.

In a time when yet another attempt at peace between Israel and Palestine have failed and tensions are increasing, some predict the rise of a Third Intifada. While there are people in both Israel and Palestine working towards peace, there are also forces that are thriving within the continued struggle. These radical groups on both sides are unwilling to compromise, and they gain support with rhetoric that does nothing but antagonize the other side. The following study will examine the radicalization of politics and its effect on the possibility of lasting peace. The Palestinian Islamic Jihad (PIJ), the Israeli Kach, and the latter's splinter group, Kahane Chai, will be used as representatives

of uncompromising factions, with emphasis placed on how the violence of such groups contributes to the preservation of an uncertain situation that neither provides security for Israel nor recognition or dignity for Palestine. The study will focus on the 1990s, the failure of the Oslo Peace Process, and the events that led to the Second Intifada in order to clarify the current situation, to understand the effects of violence today, and to determine whether or not we are seeing renewed radicalization leading to a new intifada.

While originally called "hopeful", the Oslo Peace Process turned out to be nothing but a disappointment. Some have argued that hopefulness in itself kept the peace process going, that the belief in the possibility of peace was a prerequisite for success.¹ The push for peace, however, deteriorated quickly, and hope dwindled. Security issues became one of the earliest dangers to the process. In the five years following the 1993 agreement, more than 600 people were killed by extremists who opposed the peace process. The extremists succeeded in disrupting the peace talks before lasting peace was achieved.^{1, 2} The progress made during the Oslo Process was not unmade by a single party or a single side. The purpose of this article is thus not to place blame but rather to explore one of the many variables in the failure of the peace process leading up to the Second Intifada: radicalism. While the PIJ did play a role in breaking down the peace process, they did not do so singlehandedly. The PIJ is not the sole force responsible for the failure of the Oslo Peace Process. The group is part of a larger mechanism that continues to counteract any possibility of a peaceful future.

This article seeks to answer the following:

How have organizations such as the PIJ and Kach contributed to the overall radicalization that led to the failure of the Oslo Peace Process?

Analysis

The U.S. State Department describes the Palestinian Islamic Jihad (PIJ) as a militant organization whose objective is the creation of an Islamic-Palestinian state and the "destruction of Israel through attacks against Israeli military and civilian targets."³ The PIJ was founded in the late 1970s by two members of the Muslim Brotherhood in Egypt who felt that the Brotherhood had become too moderate. Unlike the Palestinian Muslim Brotherhood, Hamas, the PIJ does not participate in politics. It uses violence as its main tool to achieve its goals, consistently refuses to recognize Israel, and refuses to participate in diplomatic relations.⁴ The writings of Sayyid Qutb, who has been credited as the intellectual forefather of the terrorist group Al-Qaida, provide a foundation for the PIJ's beliefs on Islam and militarism. Qutb viewed Islam as inherently revolutionary and necessarily militaristic when not existing in its ideal form: a community of Muslims under an Islamic state, ruled by Sharia law.⁵

According to Ilan Pappé, Professor of History at the University of Exeter, the PIJ gained momentum when members of the Muslim Brotherhood wanted to be involved in a group with a more clearly defined political agenda. They left the Brotherhood for the PIJ, where they were still able to maintain their religious affiliation but also subscribe to a national-political cause. The Muslim Brotherhood, on the other hand, maintained a pan-ideology that did little for Palestinian nationalism.⁶

The PIJ was not the only radical entity in the region during the 1990s. In addition to the PIJ, the Kach and Kahane Chai terrorist groups gained a strong presence in Israel and Palestine. For example, in 1994 Baruch Goldstein, a physician who moved from America to Israel to join the radical group Kach, killed 29 Palestinians at the Mosque of al-Ibrahim.⁷ As a result, Kach and its breakaway faction, Kahane Chai, became designated as terrorist groups.⁸ In 2005, an Israeli Defense Force (IDF) soldier with links to Kahane Chai went missing without official leave, refusing to participate in the evacuation of Israelis from the Gaza Strip. Several weeks later, he opened fire on a bus of Israeli-Arabs, killing four before being beaten to death. Apart from this attack, members of Kahane Chai have not claimed responsibility for, nor been proved to be involved in, any major attacks in the 21st century, but they do continue to express support of violence against Palestinians and Israeli-Arabs.⁹ “Preaching the motto of ‘terror against terror,’ Kach openly espoused violence against Arabs and actively participated in anti-Arab activities in Israel.”¹⁰ The PIJ, however, has continued to orchestrate several suicide bombings, including one at a Tel-Aviv nightclub in 2001, killing 21 people, and at a restaurant in Haifa in 2003, killing 22.⁴

Former U.S. President Jimmy Carter claims that the victory of Benjamin Netanyahu’s Likud party in the 1996 election was the result of two recent Palestinian acts of terrorism.¹² In the election, Netanyahu took advantage of his status as a former professional soldier of the IDF specializing in counter-terrorism.¹ For example, he was involved in a 1972 counter-terrorism operation, when four terrorists from the group Black September hijacked a plane going from Brussels to Tel Aviv, demanding the release of 317 Palestinian prisoners. An Israeli commando team managed to sabotage the plane and, after the hijackers had been convinced that it needed repair, the team entered the aircraft disguised as mechanics and seized the terrorists. The incident was highly publicized and the commando team, which included Netanyahu, was praised as heroes.¹¹ The memory of this could easily be evoked when debating between the two major parties, Likud and Labour, in the 1996 election, which was held following a series of terrorist attacks. Netanyahu and his then-Minister of Foreign Affairs, Ariel Sharon, pointed to these attacks and the 32 Israelis who were killed, as failures of the Oslo Peace Process. Therefore, Netanyahu saw no problems with supporting the expansion of settlements, something which the previous Israeli government had already

agreed not to do as part of the Oslo Process. According to Carter, Ariel Sharon even stated that “everything we take now will stay ours... everything we don’t grab will go to [the Palestinians].”¹² Netanyahu has since continued to push for more settlements, which has incited threats and violence from the Palestinian side, causing further contentiousness.^{13, 14, 15} Acts of terror led to retaliatory aggression, which promoted more violence.¹²

Laurie Zittrain Eisenberg and Neil Caplan cite the psychological effects of the failed peace process as a contributing factor to the continued violence. As previously mentioned, hope for a brighter future increased the chances of that happening. The Oslo Peace Process, negotiations that began in 1993, effectively showed how hopefulness may benefit the peace process. It works the other way around too. Acts of terror not only destroy lives and property but also incite terror and fear, which leads to suspicion, alienation, and contention. This stifled the peace process even when negotiations went smoothly because it demanded that both Israelis and Palestinians completely change their mindsets.⁷ There is, however, a more direct link between Palestinian violence and the failure to uphold the agreements made in Oslo. From the Israeli perspective, one of the most important aspects of the peace process was security. By reaching an agreement, they put their trust in Yasser Arafat and the Palestinian Liberation Organization (PLO) to handle the security situation of Palestine. When the PIJ continued to target and kill Israeli civilians, not only did that reflect badly on the PLO, but it also meant a devastating blow to the very foundation of Israel’s cooperation.¹

While it could be argued that the Likud party and its leaders would not have implemented the agreements made in Oslo anyway, considering Netanyahu’s own admission of actively trying to undermine the process, the continued violence by, among others, the PIJ gave them both reason and public support to continue their firm position on security.¹⁸ Between the Israeli right and the PIJ, we can see a cyclical pattern of action and reaction, creating distance rather than working toward understanding. This is true not only between the extremists but also between the Israeli government and the Palestinian Authorities (PA). In fact, the relationship between Likud and Kach is not much different. Their violence, such as the al-Ibrahim Massacre, is just as much a breach of security as the violence by the PIJ. After the attack in 2005 by the Kahane Chai/IDF soldier, *The New York Times* wrote, “the shooting on Thursday is certain to inflame passions on all sides.”¹⁶ Kach and Kahane

Chai, just as much as the PIJ, contribute to justifying the so-called *Hawkish*, or politically aggressive, position that has been reluctant to compromise, especially on security.

These actions of the PIJ, Kach, and Kahane Chai cannot be seen as anything other than acts of terror. According to Paul Rogers, Professor of Peace Studies at the University of Bradford, there are typically three ways of responding to terrorism: (1) intelligence and security, (2) military action, and (3) proactively undermine the motivations behind the actions.¹⁷ With the motivations being the creation of Greater Israel—a geographical area composed of at least what is currently Israel and the Palestinian Territories, but may also include Sinai and stretching to the Euphrates River—on the one side and Israel’s complete destruction on the other, there is little room to work proactively.¹⁸ One can see direct correlations between acts of terror and public support for the Israeli right’s hardline on settlements and security. This hardline, in turn, contributed to the breakdown of the Oslo Peace Process and eventually, the radicalization culminated in the Second Intifada (Al-Aqsa).

Conclusion

The use of violence can be seen as a means of creating a situation where negotiations are impossible and thus making violence the “last and only resort.” In other words, violence is self-perpetuating; it incites a radical response and cancels out all concessions that are made. For those holding to the belief that the only acceptable future is one where “the other” has been annihilated, violence has been an effective tactic.

The glorification and participation in violence has directly led to contention and tension. This has only worked in favor of those who are uncompromising on either side of the conflict. The essence of radicalization is that one act of radicalism feeds the next, which becomes a cycle. It could be said that in this way, not only have Kach, Kahane Chai, and the PIJ utilized the same methods, but they have used them to same end.

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Seeing myself through new eyes: The relationships between mentoring relationship quality and youth self-concept

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Abstract

Adolescence is a critical, and often confusing, period of development in which youth form working models of their self-worth based on experiences and interactions with others. As society continues to see youth participating in delinquent behaviors, the attention paid to the effectiveness of mentoring intervention programs has increased. The present study explored the relationships between mentor relationship quality and youth self-esteem, happiness, and loneliness among adolescents enrolled in Campus Corps, a 12-week mentoring program for at-risk youth. Surveys were distributed to 248 youth (ages 11-18) at three time points during the program. Results from a series of paired sample t-tests indicated significant increases in self-esteem and happiness from pre-test to post-test, but did not reveal significant decreases in loneliness, as predicted. Results of the regression analyses indicated that mentor relationship quality was not a significant predictor of self-esteem or happiness above and beyond control variables; however, relationship quality did significantly predict youth loneliness levels. These results suggest that, for the participants of the sample, youth had higher self-esteem and were happier after participating in the mentoring program, regardless of mentor relationship quality. Furthermore, youth who experienced higher quality relationships felt less lonely. Directives for future research exploring mentoring effectiveness and youth well-being are discussed.

Introduction

Little debate exists regarding adolescence as a critical period of the human lifespan for identity exploration and development. These years, from personal and academic standpoints, are often filled with countless opportunities to experience new things, meet new people, and develop new beliefs and ways of thinking.¹ It is from these diverse experiences that adolescents formulate their unique identities and perceptions regarding their abilities and self-worth.

Considering the substantial influence that peer groups have on adolescents, it is understandable that youth with low self-esteem are more inclined to turn to delinquent groups and activities.¹ They develop the mindset that their self-worth is determined by their participation in delinquent acts and associate feeling better about themselves with said delinquent acts.² As a result, it is critical that interventions are explored and put into place to assist these youth through healthy identity and self-concept development trajectories.

One such intervention option that has been gaining considerable strength in the past few decades is mentoring programs, in which youth are partnered with role-models who advise and guide them through the academic, social, and occupational realms of their lives.³ Mentoring intervention programs have the potential to guide these youth down more favorable paths, away

from delinquency, and in the direction of fulfilling futures.⁴ The purpose of the current study is to explore the relationship between mentoring relationship quality and self-concept (i.e., self-esteem, happiness, and loneliness) development in at-risk adolescent youth.

Literature Review

Frameworks

A leading comprehensive model regarding the influence of mentoring on youth development is that of Jean Rhodes. According to her model, the first critical step towards modifying and enhancing youth development is establishing a personal connection, characterised by empathy and mutual trust, between the mentee and mentor.^{5,6} This creates a strong framework on which an even stronger mentoring relationship can develop. As the relationship grows, it has the potential to influence multiple domains of youth development, specifically those of social-emotion, cognition, and identity, resulting in improved outcomes for adolescents.^{5,6}

In addition to Rhodes' model, research has suggested that effective mentoring programs dedicate substantial time and energy towards training mentors, clearly communicate their goals and objectives to mentors, and consistently provide mentoring services in a constant setting.^{7,8,9} Additionally, the most effective mentors are those who

identify with the goals and objectives of the mentoring program, are tactful, firm, and patient with youth, and model appropriate and desired behaviors for youth.^{7,10} Furthermore, it is critical that mentors are committed to the relationship, serving as reliable and stable figures in the youth's lives.⁵

Mentoring effectiveness

Empirical evidence, although mixed, seems to suggest that mentoring relationships can be beneficial for the youth involved. For example, youth who participated in an 18-month mentoring program reported lower levels of alcohol and drug use, violent outbursts, and truancy when compared to non-mentored youth.⁹ Additionally, interviews revealed that the mentored youth reported higher levels of confidence regarding academics and more positive relationships with parents and peers.⁹ Similarly, research conducted in the realm of self-perception enhancement through mentoring relationships suggests that youth who viewed their mentors as reliable, significant figures in their lives were more likely to report higher levels of self-esteem and empowerment and lower levels of loneliness.^{11,12} Furthermore, mentoring, especially that which occurs in a structured, formal setting, can empower youth by providing them with the opportunity for pro-social interactions with peers and adults.⁶ This has the potential to increase

their self-esteem while lowering their levels of loneliness.⁶

Research has also suggested that the longer a youth is involved in a consistent mentoring relationship, the greater the positive manifestations the youth experiences.¹³ For example, in one mentoring program, youth involved in relationships that extended beyond 12 months reported less drug and alcohol use and elevated intrapersonal, interpersonal, and academic self-worth levels.^{8,13} However, other research has suggested that perceived mentor/mentee closeness, in comparison to relationship duration, may be more strongly associated with perceived relationship benefits.¹¹ In that, shared activities and the amount of contact youth had with mentors were stronger predictors of perceived youth benefits than relationship duration.¹¹ This suggests that the quality of a mentoring relationship may be more important and influential than the amount of time mentors and youth spend together in shared activities, regardless of relationship duration.

The current study

The purpose of the current study is to examine whether the quality of mentoring relationships is related to youth's self-esteem, happiness, and loneliness. It is hypothesized that a positive association will be found

between mentor relationship quality and youth self-esteem and happiness levels. Conversely, it is hypothesized that mentoring relationship quality will be negatively associated with youth feelings of loneliness.

Methods

Participants

The sample consisted of 248 mentored youth over the course of three academic semesters from Fall 2011 to Fall 2012. Sixty-two percent of the participants were male, ranging in age from 11-18 years ($M=15.02$, $SD=1.93$). Just less than the majority of participants identified as white (48.4%), followed by Hispanic/Latina at 34.3%, and the remaining 17.3% as other minority statuses. Of the 248 participants, 68.5% of participants had charges. These charges were primarily misdemeanors (68.5%) or petty offenses (22.2%). The most common charges were for drugs (17.6%) and theft (15.5%). In regards to the mentor/mentee pairs of this sample, just over 52% were in opposite-gender pairs, indicating that the remaining 47% were in same-gender matches.

Procedures

This study protocol was approved by the Institutional Review Board at Colorado State University (IRB #10-2115H). Participants of the current study

were recruited using convenience sampling. Trained staff informed youth and guardians of the purpose of the study during an intake meeting with Campus Corps. They were informed that they could decline or discontinue research participation at any time with no consequences to them. Informed consent was obtained from youth interested in participating and at least one legal guardian.

All participants were members of Campus Corps, an on-campus intervention mentoring program offered through Colorado State University. Campus Corps serves youth who have been identified as at-risk for poor outcomes. Each youth, referred by probation officers, schools, the Department of Human Services, and other community programs, is partnered with a trained college student mentor for a 12-week period.⁴ Mentee/mentor pairings are made based on similarities in information (i.e., interests, hobbies) collected during mentee intake meetings and mentor training sessions.⁴ During the course of their mentoring relationship, mentors assist youth with homework, the development of effective study and life habits, and participation in pro-social activities.⁴ Mentors and youth meet at the same night each week for four hours on the Colorado State University campus.⁴

Previous research indicates that Campus

| Variable | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---------------------|---------|---------|---------|-------|---------|---------|---------|---------|--------|---------|----|
| 1. Mismatched pairs | 1 | | | | | | | | | | |
| 2. Female | -.746** | 1 | | | | | | | | | |
| 3. Age | -.035 | .080 | 1 | | | | | | | | |
| 4. Minority | -.154* | .058 | -.189** | 1 | | | | | | | |
| 5. preSDQ | .018 | -.168** | -.053 | -.031 | 1 | | | | | | |
| 6. pSDQ | .095 | -.252** | -.101 | -.027 | .560** | 1 | | | | | |
| 7. preHAPPY | .063 | -.114 | -.109 | -.004 | .541** | .457** | 1 | | | | |
| 8. pHAPPY | .203* | -.193** | .014 | .034 | .460** | .516** | .559** | 1 | | | |
| 9. preLONELY | .038 | -.020 | .078 | .149* | -.372** | -.344** | -.385** | -.290** | 1 | | |
| 10. pLONELY | -.065 | .112 | .187** | .004 | -.334** | -.444** | -.348** | -.333** | .516** | 1 | |
| 11. YMSrel | .064 | -.092 | -.124 | -.066 | .120 | .154* | .231** | .146* | -.060 | -.182** | 1 |

Table 1. Correlation coefficients for key variables

Note. * $p < .05$, ** $p < .001$; pre=pre-test, p = post-test; SDQ = self-esteem, HAPPY = happiness, LONELY = loneliness, YMSrel = relationship quality

Corps is effective in reducing youth's involvement in problem behaviors including alcohol and marijuana consumption and academic truancy.⁴ The program takes a one-on-one mentoring approach within a larger family systems context.¹⁴ On any given Campus Corps evening, youth experience one-on-one interactions with their mentors as well as larger group interactions with other mentees and their mentors. Each mentor-mentee pair is part of a larger "mentor family", composed of 4-5 other youth of similar age and gender and their mentors.⁴ This allows them to develop close relationships while also gaining experience as a member of a larger group context.

Participants filled out three surveys (e.g. pre-test, mid-way, and post-test) each. The pre-test survey was administered prior to youth participation in Campus Corps, the mid-way survey was administered halfway through the program at six weeks, and the post-test survey was administered at the end of the program. The pre-test survey examined youth self-perceptions regarding self-esteem, feelings of happiness, and feelings of loneliness. The mid-way survey measured youth perceptions regarding mentoring relationship quality, and the post-test examined mentoring relationship quality and youth self-esteem, happiness, and loneliness. Each survey took approximately 30-60 minutes to complete.

Demographic information was collected as part of the study. All demographic information was coded in order to ensure participant confidentiality. In addition, participant names were entered into a drawing for an iPod, providing incentive to participate. Once the surveys were completed, the data was imputed and

analyzed using IBM SPSS software.

Measures

Participants self-reported demographic information as part of each survey. For regression control variable purposes, dummy codes were created for youth gender (female=1, male=0) and minority status (minority=1, Caucasian/non-Hispanic=0). Additionally, dummy codes were applied to mentoring relationship gender matching (gender mismatch= 1, gender match= 0), or whether the gender of the mentor and mentee in each relationship was the same or different.

Mentor Relationship Quality

Youth perceptions of the quality of their mentoring relationships were assessed using the 25-item relational quality subscale of the Youth Mentoring Survey (see Appendix A).¹⁵ A 4-point Likert scale was used to assess participant responses, with available responses ranging from 1.00 ('not at all true') to 4.00 ('very true'). An example item includes: 'My mentor and I are close (very good friends).' This measure was reliable with Cronbach's alpha equal to .88.

Self-esteem

To assess self-esteem, the 12-item general self-esteem subscale of the Strength Description Questionnaire III was used (see Appendix B).¹⁶ A 4-point Likert scale was used to assess participant responses, with available responses ranging from 1.00 ('false') to 4.00 ('true'). One item is: 'I have a pretty positive feeling about myself.' With Cronbach's alpha equal to .89, this measure was reliable.

Happiness

The Subjective Happiness Scale was utilized to assess participant happiness (see Appendix C).¹⁷ Four statements were measured on a 7-point Likert scale, with possible responses ranging from 1.00 ('not a very happy person', 'less happy', 'not at all') to 7.00 ('a very happy person', 'more happy', 'a great deal'). The statements included: 'In general, I consider myself...' and 'Compared to most of my peers, I consider myself...' The sum of participant responses was calculated. The measure was reliable, with Cronbach's alpha equal to .71.

Loneliness

Participant loneliness was measured with the 4-item Revised Loneliness Scale (see Appendix D).¹⁸ A 4-point Likert scale, with possible responses ranging from 1.00 ('never') to 4.00 ('always'), was used to examine participant responses. An example statement included: 'I feel in tune with the people around me.' This measure had low reliability with Cronbach's alpha equal to .51.

Results

Prior to hypothesis testing, correlation analyses were conducted to examine how demographics and other variables were related to the dependent variables (e.g. self-esteem, happiness, and loneliness) (Table 1). Demographic variables that were significantly related to the dependent variables were included in the regression models. Specifically, youth gender was negatively correlated with self-esteem at post-test, suggesting that female youth have lower levels of self-esteem both prior to and after involvement in mentoring relationships. Youth gender, therefore, was controlled for in the subsequent analysis regarding self-esteem. Youth gender was also observed to have a significant negative association with happiness, suggesting that female youth were more likely to be less happy at post-test. Male/female pairs were positively associated with happiness, supporting the notion that youth with mentors of the opposite sex were happier at post-test than those with same sex mentors. Because of these associations, youth gender and male/female pairs were controlled for in the subsequent happiness model. Furthermore, age was controlled for in the loneliness model due to the significant positive relationship observed. In other words, older youth are lonelier.

Descriptive statistics were run on key variables between pre and post-test. For means and standard deviations of key variables, see Table 2. Paired samples t-tests were conducted in order to determine if the changes observed in the mean scores of the dependent variables between pre and

| Variable | N | Minimum | Maximum | M | SD |
|-----------|-----|---------|---------|------|------|
| preSDQ | 247 | 1.58 | 4.00 | 3.18 | .57 |
| pSDQ | 217 | 1.58 | 4.00 | 3.36 | .60 |
| preHAPPY | 243 | 1.75 | 7.00 | 4.99 | 1.13 |
| pHAPPY | 211 | 1.00 | 7.00 | 5.48 | 1.30 |
| preLONELY | 240 | 1.00 | 3.50 | 2.12 | .54 |
| pLONELY | 213 | 1.00 | 3.50 | 2.07 | .58 |
| YMSrel | 209 | 1.00 | 4.00 | 3.19 | .74 |

Table 2. Tier Two Responses Table

Note: pre= pre-test, p = post-test; SDQ = self-esteem, HAPPY = happiness, LONELY = loneliness, YMSrel = relationship quality

post-test were statistically significant. The t-test run on youth self-esteem revealed that the observed increase in mean score was statistically significant, $t(215) = -4.242$, $p < .001$. Similarly, the happiness t-test revealed a significant difference between pre and post-test, $t(207) = -6.062$, $p < .001$, with mean scores increasing. The loneliness t-test revealed that the observed decrease in these mean scores between pre and post-test was not significant, $t(204) = 1.043$, $p = .298$.

Testing of Hypotheses

Linear regression analyses were conducted to determine whether the quality of mentoring relationships significantly predicted youth self-esteem, happiness, and loneliness above and beyond identified control demographic variables and pre-test levels of the outcome of interest.

Self-esteem

In the self-esteem regression model, youth gender and self-esteem levels at pretest were controlled for. Results suggested that this model was significant, $F(3, 204) = 41.89$, $p < .001$, and that about 38% of the variance in self-esteem was accounted for by the full model, $R^2 = .38$. However, relationship quality did not significantly predict post-test self-esteem levels above and beyond the control variables. For regression coefficients, see Table 3.

Happiness

Youth gender, happiness levels at pre-test, and whether mentor/mentee pairs were the same or different genders were controlled for in the regression model predicting youth happiness. This model was significant, $F(4, 149) = 18.62$, $p < .001$, $R^2 = .33$. Approximately 33% of the variance in happiness was accounted for by this model. Results suggested that when controlling for the listed variables, relationship quality did not significantly predict post-test happiness levels (Table 3).

Loneliness

Youth age and loneliness levels at pre-test were controlled for in the model predicting loneliness. The model was significant, $F(3, 197) = 33.67$, $p < .001$, $R^2 = .34$. About 34% of the variance observed in loneliness was accounted for by the model. The regression analysis suggested that relationship quality significantly predicted post-test loneliness levels above and beyond the influence of the control variables (Table 3). That is, higher relationship quality was associated with lower levels of youth loneliness.

Discussion

The goal of the present study was to

explore the relationship between mentoring relationship quality and subsequent self-rated levels of youth self-esteem, happiness, and loneliness. It was hypothesized that relationship quality would be positively related to levels of self-esteem and happiness, and negatively associated with loneliness. Although both self-esteem and happiness increased between pre and post-tests, the findings of this study did not support that a significant correlation exists between relationship quality and these dependent variables. However, results did suggest that relationship quality and levels of youth loneliness had a significant negative association.

Relationship quality and self-esteem and happiness

Although theoretical perspectives (i.e., Rhodes' mentoring model) would suggest that youth who experience high quality mentoring relationships would be more likely to experience elevated levels of self-esteem and happiness, there are explanations as to why no significant relationship was found between these variables in this study.^{5,6,19} Having a close relationship with at least one person and feeling as though one belongs to a supportive community were identified as protective factors for youth in adversity.²⁰ Although results suggest that specific mentoring relationships may not significantly influence self-esteem and happiness, Campus Corps as a community serves as a protective factor against negative self-perceptions and low happiness because of the support and sense of belonging that it provides to youth participants.²¹ This could explain the increases observed in averaged youth scores of self-esteem and happiness between pre and post-test, regardless of the lack of a significant relationship between these variables and mentoring relationship quality.

It is also possible that, in this specific study, no significant relationship was found between mentoring relationship quality and youth self-esteem and happiness because of mentoring relationship duration. At 12 weeks, the youth of this study experienced a relatively short mentoring relationship which may have lacked sufficient time to establish trust between mentors and mentees. Research has suggested that mentoring relationships lasting less than 12 months are too short to yield significant benefits for the youth involved due to lack of trust formation.^{8,13} This could potentially explain why neither of the associations explored were found to be significant.

Relationship quality and loneliness

As previously stated, mentoring relationship quality had a significant negative

association with youth loneliness levels. It is possible that, as their self-esteem and happiness levels increased, the youth began to feel less lonely because they saw Campus Corps as a safe environment where they were supported by people who believe in them and their self-worth. Additionally, the weekly presence of a consistent and reliable mentor may have contributed to youth feeling less lonely, as they knew that at that specific time on that specific day every week, someone would be checking in to see how they were doing. This falls in line with the research of Rhodes, which emphasized the importance of mentors being consistent and reliable figures in the lives of their mentees.⁵

No significant difference was observed in loneliness, however, between pre and post-test. In light of the significant relationship observed between mentor relationship quality and youth loneliness levels, it is possible that, in order for significant differences to occur, youth must be involved in high quality mentoring relationships. If they experience a high quality one-on-one relationship with their mentor, they will be the sole focus of that mentor's attention and thus feel less lonely.

Study limitations

This study had limitations that may have impacted the results. First and foremost, the sample was not representative due to convenience sampling, creating potential biases with the youth involved. Because of this sampling methodology, the findings are low in external validity and not generalizable to a larger, representative adolescent population. Further biases may have been incurred due to the self-report nature of the surveys. Additionally, the Revised Loneliness Scale used to measure youth loneliness had low reliability.¹⁸ The results regarding relationship quality and loneliness, therefore, should be taken with caution.

Implications and future directives

The findings of this study have important implications for adolescent intervention programs and future research. Although no significant relationship was found between relationship quality and youth self-esteem and happiness, the observed increases in these variables over the duration of the program suggest that youth still experienced benefits from their involvement. This suggests that mentoring programs may be viable intervention options.

The potential protective functions that intervention programs may provide youth, such as safe environments in which the youth feel accepted and nurtured by the staff, would be valuable to explore in future research. Additionally, experimentally exploring how

| | Self-Esteem (post) | | Happiness (post) | | Loneliness (post) | |
|------------------|--------------------|-------|------------------|-------|-------------------|-------|
| | B | SE | B | SE | B | SE |
| Constant | 1.279*** | .241 | 2.309*** | .550 | .423 | .350 |
| Female | -0.173* | 0.69 | -0.190 | .269 | | |
| Mismatched Pairs | | | .292 | .266 | | |
| Age | | | | | 0.054** | 0.18 |
| preSDQ | 0.603*** | 0.061 | | | | |
| preHAPPY | | | 0.622*** | .080 | | |
| preLONELY | | | | | 0.565*** | 0.063 |
| YMSrel | 0.068 | 0.045 | -0.007 | 0.123 | -0.113* | 0.048 |

Table 3. Regression analyses predicting self-esteem, happiness, and loneliness

Note: *** $p < .001$ ** $p < .01$ * $p < .05$; pre= pre-test, SDQ = self-esteem, YMSrel = relationship quality, HAPPY = happiness, LONELY = loneliness

relationship duration is specifically related to youth self-esteem, happiness, and loneliness with control and treatment groups would be beneficial. Lastly, repeating this study with a more reliable measure of loneliness may enhance our understanding of just how influential intervention programs may be in this domain.

Conclusion

The research regarding intervention mentoring programs continues to be mixed regarding effectiveness for the youth involved. Despite this, youth do seem to experience some degree of benefits from being involved in well-structured programs. The current study suggested that mentoring relationship quality is negatively associated with youth loneliness, and that youth involved in mentoring relationships, on average, experience increases in self-esteem and happiness. As research in this field continues, it will be important to aim to further disentangle the benefits youth may experience from high-quality mentoring relationships and programs to enhance adaptive, pro-social development in future generations.

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Appendix A

Relational quality subscale of the youth mentoring survey

| Statements | Not at All True | A Little True | Pretty True | Very True |
|---|-----------------|---------------|-------------|-----------|
| I talk with my mentor when I have problems or things that worry me. | 1 | 2 | 3 | 4 |
| My mentor lets me choose what we do, or else we choose it together. | 1 | 2 | 3 | 4 |
| I have learned a lot from my mentor. | 1 | 2 | 3 | 4 |
| My mentor makes me happy. | 1 | 2 | 3 | 4 |
| My mentor and I hit it off right away (liked each other quickly). | 1 | 2 | 3 | 4 |
| My mentor and I are close (very good friends). | 1 | 2 | 3 | 4 |
| I just want my mentor to be fun, not someone who helps with schoolwork or problems. | 1 | 2 | 3 | 4 |
| My mentor focuses too much on school. | 1 | 2 | 3 | 4 |
| My mentor makes me feel special. | 1 | 2 | 3 | 4 |
| My mentor is a good match for me. | 1 | 2 | 3 | 4 |
| I am doing better at school because of my mentor's help. | 1 | 2 | 3 | 4 |
| I know a lot about my mentor's life (his/her family, job, etc.). | 1 | 2 | 3 | 4 |
| I want my mentor to teach me how to do things. | 1 | 2 | 3 | 4 |
| I wish my mentor would not try so hard to get me to talk about things I don't want to talk about. | 1 | 2 | 3 | 4 |
| My mentor has helped me with problems in my life. | 1 | 2 | 3 | 4 |
| I can always count on my mentor (to show up, to do what he/she promises, etc.). | 1 | 2 | 3 | 4 |
| My mentor and I like to do the same things. | 1 | 2 | 3 | 4 |
| My mentor really cares about me. | 1 | 2 | 3 | 4 |
| I am willing to try new things that my mentor suggests (foods, activities, etc.). | 1 | 2 | 3 | 4 |
| I wish my mentor would not get on my case so much (about how I act, what I wear, etc.). | 1 | 2 | 3 | 4 |
| My mentor helps me get in less trouble (make better decisions, behave better, etc.). | 1 | 2 | 3 | 4 |
| I get to see my mentor regularly. | 1 | 2 | 3 | 4 |
| My mentor and I like to talk about the same things. | 1 | 2 | 3 | 4 |
| My mentor knows what is going on in my life. | 1 | 2 | 3 | 4 |
| I want my mentor to help me do better at school. | 1 | 2 | 3 | 4 |

Appendix B

General self-esteem subscale of the strength description questionnaire III

| Statements | False | Mostly false | Mostly true | True |
|--|-------|--------------|-------------|------|
| I have a lot of respect for myself. | 1 | 2 | 3 | 4 |
| I lack self-confidence. | 1 | 2 | 3 | 4 |
| I am pretty accepting of myself. | 1 | 2 | 3 | 4 |
| I don't have much respect for myself. | 1 | 2 | 3 | 4 |
| I have a lot of self- confidence. | 1 | 2 | 3 | 4 |
| I have a very good self-concept. | 1 | 2 | 3 | 4 |
| Nothing that I do is very important. | 1 | 2 | 3 | 4 |
| I have a pretty positive feeling about myself. | 1 | 2 | 3 | 4 |
| I have a very poor self-concept. | 1 | 2 | 3 | 4 |
| I have pretty negative feelings about myself. | 1 | 2 | 3 | 4 |
| I do lots of things that are important. | 1 | 2 | 3 | 4 |
| I am not very accepting of myself. | 1 | 2 | 3 | 4 |

Appendix C

Subjective happiness scale

| | | | | | | |
|--|---|---|---|---|---|---------------------|
| In general, I consider myself: | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Not a very happy person | | | | | | A very happy person |
| Compared to most of my peers, I consider myself: | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Less happy | | | | | | More happy |
| Some people are generally very happy. They enjoy life and get the most out of everything. How much does this describe you? | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Not at all | | | | | | |
| Some people are not very happy. They aren't depressed, but they aren't as happy as they might be. How much does this describe you? | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Not at all | | | | | | A great deal |

Appendix D

Revised loneliness scale

| Statements | Never | Rarely | Sometimes | Always |
|---|-------|--------|-----------|--------|
| I feel in tune with the people around me. | 1 | 2 | 3 | 4 |
| No one really knows me well. | 1 | 2 | 3 | 4 |
| I can find companionship when I want it. | 1 | 2 | 3 | 4 |
| People are around me, but not with me. | 1 | 2 | 3 | 4 |

Service-learning: Bridging the gap between classroom instruction and ground reality

BY STUTI DAS

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Abstract

Stuti was part of a five-member delegation from her college to an international conference and service-learning program, Learning From Yolanda: Disaster Response, Community Resilience and the Role of Asian Universities organized in response to Typhoon Haiyan by the United Board for Christian Higher Education in Asia in collaboration with five universities in the Central Philippines, namely, Central Philippine University, University of St. La Salle, Silliman University, Filamer Christian University and St. John's College, in the Visayas region of the Philippines from June 28 to July 11, 2014. The contingent was led by Dr. J. Sasitha, Head of the Department of Sociology, Stella Maris College, Chennai, India. The objective of this program was to offer the participants an insight into the disruptive effects of a natural disaster on community life and to provide them with an opportunity to participate in the rebuilding and restorative efforts that follow. In this piece, Stuti reflects on her experience of volunteering at a shelter complex in Estancia, Philippines through her interactions with those displaced by the typhoon.

I can recollect the first time I came across the news of Typhoon Haiyan: on a morning very much like any other, while reading the day's newspaper. "Typhoon Haiyan kills over 1000 in Philippines," the headline read.¹ The report that followed described the resultant death and devastation, and the relief efforts being undertaken. I read it, feeling quite shocked at the scale of damage, before rushing out for a morning class.

While considering the headline during my walk to class, I thought of Susan Sontag's book, *On Regarding the Pain of Others*, a thought-provoking meditation on modern life. In the context of her study of wartime photographs, Sontag speaks of the great distinction that lies between the reality of war as experienced firsthand and the perception of those who only observe and respond to the images of war. Dwelling on the representations of atrocity, she argues that, depending on the context in which they are being viewed, photographs often confer upon reality an altogether different meaning. In his review of Sontag's book, Peter Conrad from *The Observer* asked a resonating question: In our 'culture of spectatorship', have we lost the power to be shocked?²

I argue that perhaps we have. Of the remainder of the day on which the news and images of Haiyan first reached me, I do not remember anything. Within a month, barring an occasional reference or two, Haiyan was out of international news. I cannot claim that it was on my own mind for much longer than that.

We can extend Sontag's observations to the context of our current education system. Given its excessive reliance on classroom

instruction, I began to wonder about the extent to which this system contributes to Conrad's "culture of spectatorship". Within the relative comfort and security of the four walls of a classroom, reality is communicated far removed from its actual context. These transmitted words and images at best convey only a partial meaning; in turn, they endow the recipient with only an imperfect understanding. The truth then is this: between traditional classroom experience and a near-accurate understanding of reality, a world lies waiting.

This is where, I believe, service-learning programs which seek to combine formal instruction with the opportunity to serve in the community assume importance. I say this in light of my own experience. Nearly eight months after first reading about Typhoon Haiyan, I found myself as part of a delegation to an international conference and service-learning program, titled *Learning from Yolanda: Disaster Response, Community Resilience and the Role of Asian Universities* organized in Panay and Negros islands by the United Board for Christian Higher Education in Asia. The aim of the program was to help a contingency of international students and teachers learn about the processes of renewal and recovery from the trauma of a disaster, and to give them an opportunity to contribute their bit to the process. After a two-day conference followed by a day-long orientation program on the beautiful green campus of the Central Philippine University – a locally declared tourism site with parks, gardens and open spaces – we set out for a seven-day sojourn among people with whom we had never before crossed paths. In total

we encompassed 12 groups of service-learners, and 12 host communities. Our aim was to observe, to understand, to learn, and wherever possible to lend a helping hand.

Having never been part of anything similar before, I arrived not knowing what to expect. Forced out of the familiarity of my own life into unfamiliar terrains, both geographically and mentally, I experienced a sensation quite akin to landing on another planet. What I returned with, in addition to several enriching experiences, was the awareness that classroom education informs, but service-learning educates by helping us to transcend the state of being a mere spectator to being part of the situation itself. In the process it imparts us not just with an in-depth knowledge of the phenomenon at hand but also with valuable lessons on empathy and understanding, teaching us to reach out – not merely with our hands but also with our hearts.

Memories of our first day of work among those displaced by the typhoon still remain fresh in my mind. It is 11:20 in the morning. A scene composed of several smaller images greets us: in front of a row of wooden houses, children play, and their shouts and laughter fill the air. In one corner, under a tarpaulin sheet, a small group of women sit huddled around a big table. In the clear, blue, infinite sky overhead, the summer sun shines strong and bright: a glaring Cyclops. You cannot see the ocean, but you can sense its presence. Straining our ears, we hear the warm, briny air carrying the rhythmic sound of waves falling on the shore.

This is Estancia, a municipality in the province of Iloilo in the Philippines. These

women and children are among those who have been rendered homeless by Typhoon Haiyan. The wooden houses, evocative of Pete Seeger's *Little Boxes*, constitute the shelter complex the government has assigned them.

"... they are all made out of ticky tacky
And they all look just the same."

The UN estimates that more than 4 million people remain homeless due to Haiyan, or Yolanda, as it is referred to in the Philippines.³ The National Disaster Risk Reduction & Management Council (NDRRMC) estimates the total cost of damage at Philippine Peso 89,598,068,634.88.⁴ Here, statistics take on human form: numbers seldom tell the whole story.

The shelter complex bustles with activity: people going about their domestic chores, clothes being washed, pots and pans being cleaned, soil being tilled for a kitchen garden. Several *sari-sari*⁵ stores are doing a brisk business; children play at their games. Amidst all these, under the makeshift tarpaulin sheet shelter, a meeting is in progress. In the wee hours of the morning, when the sun has yet to ambush the night, the men go out into the ocean to cast their nets, we are told. Life goes on.

Located along the Pacific Ocean's "Ring of Fire" and surrounded by bodies of water, the Philippines is no stranger to natural disasters. From typhoons to tsunamis, volcanic eruptions to earthquakes, the country has seen it all. Nobody had imagined Haiyan to be any more devastating than any of the other 20 or so typhoons that lash the scattered archipelago every year. However, it came to be documented as the strongest storm recorded at landfall. Unofficially the strongest typhoon recorded in terms of wind speed, Haiyan remains the deadliest Philippine typhoon ever.⁶

What these facts translate into, in terms of the typhoon's impact on the lives of the people, becomes evident to us on the sultry afternoon when we meet 60-year-old Ananio Putashio. In a clear, quiet voice she recounts her losses: the house; the fishing boats; the animals – pigs, poultry; all of her material belongings.

We are stunned into silence: this is a lot to take in. Eventually, the conversation resumes.

Many a typhoon have been witnessed and experienced by Ananio during her lifetime. She could not imagine Haiyan would be any different. But there was something very unusual about November 8, 2013.

First there was wind, coming in strong violent gusts. Then there was water: at around 10 p.m. on November 7, the first

rains from Haiyan started pouring down. In the early hours of November 8, the typhoon hit with full force. In a matter of minutes the ocean water began surging in, ready to devour all. Typhoons usually bring high winds but rarely mountainous waves; this was not the case with Haiyan. Ananio and her family ran out of their house to the safety of a small hill nearby. Two hours later when the rain stopped, the reality of her life had been entirely re-written: house gone; livelihood gone; a lifetime of accumulations, loves, thoughts, hopes – all gone.

"... A crash of sorrow on the shores
of Earth. ..."⁷

What must it have felt like? The question remains unasked, unanswered.

Reasons behind the recurrence of such natural disasters continue to be explored and researched. Many climatologists have held climate change responsible for Typhoon Haiyan. According to Professor Will Steffen, a former director of the Australian National University Climate Change Institute, there exists a clear link between Haiyan and a warming world.⁸ Typhoons, hurricanes and all tropical storms draw their vast energy from the warmth of the sea. Therefore, rising sea-surface temperatures have a direct influence on the nature of storms. New research suggests that the Pacific Ocean is warming possibly at its fastest rate in 10,000 years. When released into the atmosphere, the extra heat will lead to an inevitable increase in the severity of storms.⁹ The Philippines, which is the first landmass that typhoons encounter on their usual track westwards from the mid-Pacific, is always the first to face extreme events. Haiyan is the third superstorm to strike the archipelago in a year.¹⁰

Walking along the shore, the deep, sapphire waters of the Pacific Ocean look so calm, so peaceful, so incapable of evil that it requires a fair stretch of the imagination to think of the havoc it unleashed only a few months ago. 45-year old Noël, one of the residents of the shelter complex, tells us that the speed of recovery in most parts of the Philippines has been quite incredible, but efforts are far from over. Physical evidence lives on to tell the tale: trees ripped from their roots, buildings without roofs, broken schoolroom windows, piles of wood stacked where houses once stood. There is a sudden disappearance of familiar landmarks, but a gradual obliteration of cultural history and memory.

But personal memories are strange things in that they endure. Memories of the good as well as the bad linger. A poignant example of the emotional toll that natural disasters

can and do take on those affected comes in the form of an interview with Noël, who tells us about the utter helplessness he felt as he stood watching his house – the one his siblings and he grew up in, the one he called home – getting washed away into the ocean. He narrates to us the terror he experienced on seeing those huge waves coming in one after the other – one receding, another rising. We listen on as he tells us about the fear invoked in him by the deep roar of the wind and the eerie silence afterwards; about the shock he experienced from the sight of corpses scattered along the coast, of trees strewn across roads, of ships washed ashore, of mountains of rubble everywhere, of farmlands reduced to lakes of brown mud; about the profound sadness he felt at the sound of children's cries through nights; about how weak and exhausted he had grown from having to survive on water alone for a week before help was to arrive. All these and a great deal more Noël remembers. There is a lot that he has to come to terms with, he tells us. A surge of grief overwhelms us.

A tragedy, however, is never the story of just a day; it is also the story of the days and months afterwards. This we realize as we hear about how even after 8 months, when it has long gone out of international news, Haiyan continues to shape the lives of the people. 31-year old Raia recounts the overwhelming uncertainty that has suddenly gripped her life. Having lost his boat to the ocean, her fisherman husband has now taken up the work of carrying fish to the market. Concerns about providing for their four children, which had never featured among their worries before, now haunt them night and day. In another six months they will have to arrange for their own accommodation, as the present one has been allotted for a period of only a year. Added to this problem are concerns of space constraints, water shortages, occasional fights among neighbors, ailments that arise from living in cramped quarters, and above all, deep down in their heart of hearts, the fear of losing this shelter too to nature's wrath. And from all these arises the question: how do we start again?

At a makeshift day care center we are greeted by a bunch of cheerful toddlers. On rainy nights they still cry themselves to sleep, their mothers tell us.

But despite all this, the Filipino spirit shines. Even in the face of overwhelming grief, they smile. Ever kind, always helpful, and never unwilling to engage in friendly chatter, one finds no dearth of kind faces in public places. We go to them during one of their most difficult periods, yet they welcome us with open arms. They share with us stories not just of that one fateful night,

but also of the days and months after as they struggled to get back on their feet. Once during a late afternoon visit to a school in Botongon, one of the worst affected areas, in the last rays of the setting sun, a graffiti scribbled across a classroom wall caught our eye. It read: NOTHING CAN DESTROY US, summing up perfectly well, we thought, what the Filipino spirit embodies: a powerful lesson for all of humankind on the resilience of the human spirit and the invincibility of the human mind.

Disasters – natural or anthropogenic – pose a great challenge to local leadership and the pace of recovery often rests on its efficiency. Nowhere is it more evident than in the case of Haiyan, where we witnessed firsthand the significance of community leadership in dealing with the aftermath of a calamity. Condemnations of slow government action in the relief effort in response to the typhoon surfaced in media reports soon after the storm is over.¹¹ The government has also been criticized for its apparent lack of preparation and for its failure to effectively facilitate coordination among its agencies during the aid operation.¹² Yet one cannot help but feel amazed at the rapidity with which the Filipinos seem to have sprung back on their feet. Throughout our interactions, stories of survivors coming together in an expression of solidarity to help each other rebuild their lives kept emerging, underlining the importance of bottom-up mobilization in combating the effects of disaster and of social cohesion in nurturing resilience to tragedy. The traits of openness, freedom of expression, flexibility, strong family orientation and a spirit of communal unity that characterize their culture infuse Filipinos with a rare strength which surfaces as that resilient spirit which aids them during times of catastrophe. Our initial apprehensions about this journey being one in which we would tread only territories of grief and loss are soon replaced by the lesson that tragedies are not just about grief and mourning but also about optimism and camaraderie.

Our final day of volunteering at the shelter complex was a particularly gritty, scorching day. Post-lunch we decided to go around the premises one last time, only to be greeted by a sight that had come to seem all too familiar: numerous banners announcing the presence of the non-governmental organizations that have been offering their services; rows of houses, similar looking, all painted in green; a yellow cardboard pinned on each door announcing the household number and the name, age and occupation of each resident. And then something none of us remembered coming across before caught our attention: perhaps it had escaped

our notice, or it could have just been put up: we may never know. Adorning the entrance of one of the houses was a wind chime, the metal rods suspended from a tiny wooden model of a boat on the mast of which are engraved in black the words: GOD BLESS OUR HOME.

“...And then the fling of hope, the finding of a shadow Earth in the implications of enfolded time, submerged dimensions, the pull of parallels, the deep pull, the spin of will, the hurl and split of it, the fight. A new Earth pulled into replacement ...”¹³

We pause to think. We never speak of people as being houseless, but always as being homeless. What is home anyway? Is it something more than a house? What is it that makes a house home? Is it the people who reside in it, the things that grace it, or the memories that accumulate from years of living in it? Here, where we are, people have lost all that to them had been familiar; most things that had been dear and beloved had left them. How long, then, would it take them to build a home? We ponder these questions, here at this shelter complex, where leaving and living coexist. We mull over several possibilities, as answers elude us.

Two days later we leave the Philippines, unsure whether we will ever come back, but certain in the knowledge that we shall carry the impressions of the past two weeks in our heads and in our hearts all our lives. We realize that we are going back with several valuable lessons – lessons on the frailty and fragility of the human body and at the same time lessons on the invincibility of the human mind and the resilience of the human spirit in the face of overwhelming grief – all of which, we trust, will last us a lifetime and beyond. We realize that we are going back a mere 15 days older but several experiences richer and numerous emotions fuller; we know that we are returning with answers, but more importantly with questions we could spend a lifetime answering.

And therein, I believe, lie the merits of service-learning programs. Facts and figures imparted through classroom education no doubt build our stock of knowledge and endow us with an awareness of the different facets of the reality around us, but service learning programs help bring textbook knowledge and news information from the realm of the impersonal to the personal, thereby functioning as a bridge between perception and insight. As a result what had once been distant ceases to remain so, and in the process understanding and empathy are born.

Looking back, I realize that the program made it possible for us to not be just tourists looking in on hardship from a comfortable place outside, but to be guests in our host communities. It helped us to strive, in our own little ways, to become part of the community and leave something behind: a house painted, a patch of land tilled, children taught, health care given, a patient ear lent. What it enabled us was to do a bit more than sighing, mourning, feeling helpless and moving on; it helped us to pause and share our humanity across cultures, languages, geographies, and life circumstances, for therein lies the seeds of compassion and the possibility of healing.

While reminiscing of his childhood days, Noël narrated how his fisher folk parents had taught them that the ocean always gives back all that it takes away. He lives in the hope that one day it will. We hope so too.

Acknowledgements

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Double majors: When interests intersect in unexpected ways

By MICHAELA KORETKO

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On the first Monday of summer, I couldn't find my sunglasses, but I found two pairs of lab goggles in between my field journals. In summer school, I explained to two classmates that the plant gene FAMA was named after a terrifying thousand-eyed, thousand-eared goddess in Vergil's *Aeneid*. And, in the first week of the semester, I used my physics homework as a bookmark for Best American Magazine Writing.

Some people would call being a journalism-biology double major crazy, but I call it being well-rounded.

I'm a junior at Colorado State University, and to date, I've only met one other science-journalism double major, Deanna Cox. Like me, she's found that the double major both merges interests and creates ambiguity. Students who choose to double major do so out of desire and necessity: the desire to pursue two interests and the lack of obvious options that incorporate aspects of both. "So, I was thinking of what careers blend both writing and environmental science, and I came up with none," Cox said with a laugh, "So I thought, 'Well, why don't I just create my own?' And I didn't really have an idea about what that would be, but when I applied to CSU, I knew that I wanted to do something with the environment and I knew I wanted to do something with writing."

Being a double major involves having two separate peer groups that often don't share your other interests, as Cox puts it. "I'm passionate about natural resources, and when I go into a journalism class, I'm the only one passionate about that." CSU's journalism program equips its students well, so much so that Cox and I feel, in some ways, more prepared to be a journalist than a scientist. However, Cox wants journalism to be her secondary skill set. "I didn't want to be a journalist. I've never wanted to be a journalist. What I wanted was to have good communication skills to integrate with the rest of my life, which is being a scientist."

Perhaps this is why CSU added a Science and Technical Communication minor to complement science majors. But there are two kinds of science writing: pieces directed towards academia and pieces directed towards a general audience, writing directed at scientists and writing directed toward science education. Both are critical, but serve different purposes, depending on which is the pri-

mary skill set. Whereas Cox wants to be a scientist with the media-oriented skill set, I want to be a journalist who pursues scientific literacy and conversation.

I came to my double major as Cox did, through interests in two different subjects, and an interest in improving scientific literacy. My classical education from elementary to high school was also largely responsible for my decision.

"The classical education provides a very thorough education, in the sense that it's liberal arts," explained Derek Anderson, principal of Ridgeview Classical Schools, the Fort Collins charter school I graduated from. "It's going to give attention to math and to music and to literature and to poetry, and to science and to emerging technologies and things like that. There isn't going to be much that's left undiscovered, unexamined." Ridgeview wasn't only where I found my desire to pursue both subjects. It's also where I decided that the combination was valuable.

In moral philosophy my junior year, I read Aldous Huxley's *Brave New World*. The novel, depicts a world that hails consumerism, efficiency, eugenics, and science. The world becomes, though created by humans, inhuman; it's cold, sterile, and amoral. One question echoed in my mind: "How could the world become like this?" Ultimately, my answer was that an ignorance of science, as well as putting scientific principles above morality, could create such a future. Even though Huxley's world was a dystopian exaggeration, it revealed a strong need to spread scientific awareness through conversation.

My college education, therefore, has become about acquiring the skills necessary to have an intelligent conversation about science, but the more I look at my experiences, the more I find that college is not primarily about education; it's mostly about vocation. Anderson says that he doesn't understand programs that are narrowly tailored early in a student's education, but that college's vocational nature makes sense. He does not see the value in high school STEM (Science, Technology, Engineering and Math) programs. "I don't know why you would narrow your focus at such a young age to say these things because they will provide a financial remuneration later on in life. The [goal] at this point in education, at this stage in life, is to provide an actual education... [University]

used to be about education, but I don't believe it is anymore. I think that it's about vocation. And actually, I don't know that that's as bad as it's sometimes derided as being, because at some point people have to acquire skills by which they can earn a living."

Although the realistic part of me hopes I can earn a living with my degree, the intellectual side of me still focuses on the need for conversation. This, too, seems linked to my classical education. "[Ridgeview graduates] know how to have conversations," Anderson said. "Most people don't have conversations. They simply rattle off one story after another, or repeat lines of movies or gossip or something else. But a Ridgeview student is one of the few out there who knows how to have a conversation. People, employers, especially if they're a little bit older, find that endearing because they encounter it so rarely." This resonates with me because Mr. Anderson's point about the scarcity of conversation is the same warning from *Brave New World*.

Conversation about serious topics, and a desire to pursue those conversations, requires that I combine my interests in biology and journalism. These desires and goals stem from not only a diverse background, but also from an understanding of various intelligence types.

Howard Gardner, a developmental psychologist, has redefined the traditional view of intelligence, concluding that there aren't just one or two types, but seven: linguistic, logical-mathematical, spatial, bodily-kinesesthetic, musical, interpersonal, and intrapersonal intelligence. The classical education model nurtures all of these intelligences in primary and secondary school. Indeed, a truly "liberal" education does. At the university level, these intelligences start to diverge more. Scientists are logical-mathematic, English majors are linguistic, music majors are musical, etc.

Frances Glycener is an honors professor at CSU who both possesses and recognizes multiple intelligences. She received a bachelor's degree in economics and a master's in dance. To her, "Dance is pretty much the same way [as economics] because you have to be technical and specific but when you're creating and everything. A lot of times you're looking at the big picture. So...in terms of how you learn about them and how you

view the world, the viewpoint is very much the same,”

Students at the university level tend to think in a linear fashion, adhering to a single topic. “I think it has to do with the educational system they’ve been in up until there and I think it’s also just a part of the whole development thing,” Glycenfer said. She has studied some developmental psychology and believes that some undergraduates’ fixation of their given subject area is because they know their own skill sets, goals, and talents. Sometimes, she said, their choices reflect a lack of development and maturity in the brain’s frontal lobe.

People who can combine majors or interests generally see overlap where maybe others do not. “I think there are probably a lot of connections between [journalism and biology], aside from the obvious [parts] where they intertwine. That’s what I found with economics and dance,” Glycenfer said. “That’s why I was surprised how much I would approach dance more in a technical sort of way.” Glycenfer’s use of certain words seems to reflect this flexibility. When she explained how she helped rearrange the honors office to make it more functional, she said, “I choreographed the desks.” Her loose use of the word “choreograph” comes from an understanding that the intelligences are fluid, and with this fluidity comes ease of conversation.

So maybe choosing a double major isn’t about pursuing two areas of study. Maybe it’s about blending multiple intelligence types and using them in conjunction with one another to approach one discipline or the other in a unique and exciting way. In my case, it’s about being a scientist who thinks like a journalist, a journalist who thinks like a scientist, and allowing those two perspectives to contribute to the larger conversation.

China's energy demand: Political, economic, and environmental implications, and its relationship to Canada's oil sands

BY DANE NEUMEYER AND SIMON NANTAIS, PHD
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Abstract

In recent decades, China has undergone a sweeping and dramatic socio-political and economic transformative process that is nothing less than extraordinary. At present, it boasts the world's largest population (at 1.3 billion), and the second largest economy. According to the International Monetary Fund, it will surpass the United States in terms of GDP growth rates by 2016, which could result in "a near-unipolar world in which China is [economically] supreme"¹ by 2030. This economic shift is feasible since currently, "China acts as the world's creditor, is the world's biggest export market, and is the world's largest manufacturing nation."² Inextricably linked to this unique and unprecedented economic surge is a need for energy. Indeed, the crux in China's sustained economic growth will rest upon its ability to develop, bolster, and secure sufficient energy supply in the coming decades.³ One arena the Chinese are subscribing to is the Canadian energy sector, which at present, is experiencing a substantial boom in both oil and natural gas. This, of course, is a complex and multifaceted issue. This paper will examine the role of Chinese energy policy through a historic, economic, political, and environmental lens. It will then explain what this consumptive pattern means for the Canadian energy sector and economy, particularly the profoundly contentious Northern Gateway⁴ project which would ship crude oil to Asian markets, notably the Chinese. I hold that China has diligently and rightfully sought out and secured energy sources to meet the demand imposed by an unprecedented economic surge, yet the current administration, which operates in a political climate that holds nations responsible for their actions to a greater degree than in the past, can and must do more to ensure that the preservation of the environment receives sufficient attention in their economic and political agenda moving forward.

Background: China's energy nationalism

In October of 1949, following a bloody and arduous civil war, the People's Republic of China came into existence under the leadership of Mao Zedong. China's bureaucratic structures and economic systems were modeled after the Soviet Union's centrally controlled government.⁵ Within this central government, "a web of constantly changing bureaucratic agencies controlled planning, production, and distribution in the energy sector."⁶ The Ministry of Petroleum Industry was one of these large agencies that dealt with extracting, distributing, and using petroleum. The agencies' plans focused primarily on short-term economic goals at the expense of long-term economic responsibility and prosperity, as, "ideology, rather than economic development, dictated the institutional structure... favour[ing] institutional simplification and consolidation."⁷ In summary, the five year plans defined China's nation-building and energy policy for the next three decades.

Spurred by rapid population and economic growth as well as a shortage of domestic energy supplies, China began to open its door to outside markets and reformed its economic system during the 1980's.⁸ This market liberalization of sorts

would provide its energy sector room for autonomy. The once amalgamated Ministry of Petroleum Industry was split into three organizations. The China National Offshore Oil Corporation (CNOOC), held the rights to the exploration for and, development, production, and sale of petroleum in predetermined offshore zones, and directed international cooperation in offshore petroleum development.⁹ The China National Petrochemical Corporation (Sinopec) was established to utilize petroleum and natural gas for production of oil products, synthetic materials, and organic raw materials.¹⁰ Lastly, the China National Petroleum Corporation (CNPC) focused on domestic petroleum exploration and the production and management of onshore petroleum development.¹¹ The central government's move to diversify and loosen regulations represented "the first time that the central government tried to remove [direct] government control of production in any of the energy sub sectors."¹² This foreshadows China's economic and, more specifically, energy strategies and consequently, its eventual emergence as a legitimate world power.

By 1993, China lacked sufficient indigenous energy supplies to sustain

economic growth and began to import oil.¹³ Though China still operated under one-party rule, a newly open approach to free markets and the erstwhile preponderant role of state-owned enterprises in domestic and now foreign economic affairs¹⁴ exemplified an indiscriminate economic transformation that at present, remains intact. The importation of energy resources was part of China's shift toward free-market economics representing a momentous transition in China's economic policy and as it turned out, the harmonious relationship that thus developed between socialist policy and capitalist apparatus appears unique to China, and has proven to be immensely successful with regard to economic growth. Today, in fact, China is the world's second largest importer of oil, has the fastest growing automobile market, and is unequivocally the largest importer of raw materials such as aluminum, coal, copper, iron ore, nickel, and steel.¹⁵ This translates to a heightened need for energy sources moving forward. CNPC alone "is currently operating eighty upstream projects with over 80 million tons of oil operated in 29 countries, spearheading the country's drive of energy expansion as a flagship globally."¹⁶ As several experts and scholars have noted, this transition has occurred in an almost

organic sense, devoid of a concrete master plan.¹⁷ Moving forward, however, China will need to address several materializations that could threaten the rate of its economic surge. Among these is the realization that declining birthrates (due to China's one child policy)¹⁸ and a rising middle-class calling for higher wages and affordable housing¹⁹ "could rapidly translate into higher production costs and lessened competitiveness of products abroad."²⁰ Such corollaries could prove burdensome given that the current state of China's economic development is one that is resource and energy intensive.²¹ That is, "since China is still in the stage of on-going urbanization and industrialization, no major changes are likely for the overall trend of energy demand growth and energy structure."²²

Sigfrido Caceres Burgos, a specialist in international development, political economy, and foreign affairs, suggests that China should eventually re-organize its economy and look to the West for guidance, as "the post-industrial economies of the West, along with Japan and South Korea, have been able, through innovation, technological improvements and steep learning curves"²³ to better diversify their economies by utilizing a variety of energy sources.²⁴

The Chinese government sees the aforementioned Western path as incongruent with their current national agenda. While Western states have previously undergone a process of industrialization, China is currently in the heart of this task. In part, China's push for "energy nationalism,"²⁵ a term that depicts China's aim to pursue, secure, and protect both domestic and foreign energy resources, reflects a historic theme of national shame and humiliation,²⁶ stemming from a period of intervention and imperialism by the Western powers and Japan spanning from circa 1839 to the mid-twentieth century. There exists a "salient notion of the rightful position of China in world affairs [that] continues to penetrate and inform Chinese foreign policy."²⁷ This includes its pursuit of energy wherein a transformation of humiliation into vindication, even salvation, remains a top priority in Chinese nationalism as a whole.²⁸ This includes, "ensuring that the economy has sufficient energy to sustain growth... and [taking] measures directed at raising energy supply rather than constraining energy demand."²⁹ In particular, Beijing puts a premium on energy security as a protective measure to ensure its industrial and economic growth.

An example of China's pursuit of energy nationalism can be seen in its recent oil stockpiling. China sees this as an integral step

in guaranteeing security (both economic and socio-political) in the event of a financial or political crisis such as the 2008 stock market crash or potential disruption in supply from foreign markets, respectively.³⁰ The goal is to secure over 700 million barrels of oil, roughly the equivalent to the U.S. Strategic Petroleum Reserve.³¹ Moreover, China has looked to the Arctic as a means of securing its energy interests, resource extraction, and maritime shipping opportunities.³² China is currently building the most advanced ice-breaking machinery and ice-strengthened bulk carriers and tankers capable of Arctic navigation.³³ As a Northern Hemisphere country affected by Arctic warming, and a permanent member of the UN Security Council, China opines that its involvement in this realm (for future shipping opportunities, potential resource extraction, etc.) is indispensable.³⁴

China's securing of resources, however, has split the international community. Although necessary in maintaining and growing its economy, Western states have characterized China's foreign energy policies as predatory. While there may be some truth to this assertion, one could argue that China's actions have been no less predatory than its Western counterparts of the past century. Moreover, there is some evidence that suggests China should have a sense of responsibility and pragmatism where securing of resources abroad is concerned. Some Western states have implied that liberal approaches to securing resources through international agreements and trade are superior in promoting international peace and economic growth.³⁵ China has been denounced in some circles for dealing in secrecy, having a lack of regard for good governance in partner countries, insufficient enmeshing with and leveraging of international institutions to tackle global threats, and staying silent in relation to regional tensions and armed conflicts.³⁶

However, there is a large body of evidence that suggests otherwise. For instance, the China-Central Asia natural gas pipeline system built in 2009 demonstrated that, despite the numerous social and security issues in Kazakhstan, Uzbekistan, and Turkmenistan, China was able to leverage multilateral trade and investment protection frameworks, such as the Energy Charter Treaty, to pursue favorable bilateral arrangements and development projects with these neighbors.³⁷ Furthermore, by dealing with traditionally demarcated 'rouge states,' China has created and developed new markets, increased the amount of total global oil production, and lowered costs across the board.³⁸ Additionally, China has begun to build a reputation of promoting aid and development abroad through its energy

policy worldwide. For instance, drafting and implementation of the Beijing Consensus has been advantageous to and has made tremendous strides in Africa and Latin America. The Beijing Consensus was:

...an economic strategy that outlines China's push for down-to-earth pragmatic concern with serving the people, constant trial and error experimentation, gradual reform rather than neo-liberal economic shock therapy, a strong and pro-development state, selective cultural borrowing of foreign ideas, and a pattern of implementing easy reforms first, difficult ones later³⁹

Accordingly, in several African nations, China has made a commitment that is long-term, planned, and strategic, "delivered through aid, direct investments in multiple sectors, technological transfers, bilateral trade agreements, and special economic zones."⁴⁰ This, of course, is not to suggest that current Sino-energy policies are completely benevolent, but rather that the aforementioned accusations of predatory practices are perhaps a bit bold. Burgos is more optimistic:

The rise of China, and the leaps of other emerging market economies, can be a political opportunity to advocate for redistribution policies that favour developing countries, especially of well governed, resource rich countries wishing to, tactfully and orderly, penetrate export markets in a sustainable fashion...[because] after all, Beijing's experiments have lifted millions of Chinese out of poverty and they believe that the application of these same tools can help African countries to develop.⁴¹

Ultimately, a characterization of Chinese energy policy as being anything less than scrupulous contains a lingering Cold War bitterness⁴² that feels, in this author's opinion, antiquated.

Chinese Energy's Impact on the Environment

Most imperative to the discussion of Chinese energy pursuits is, of course, the environment. Historically, there have been instances (in the Western context) where a concern for the health and maintenance of our natural surroundings has been little more than an afterthought. As the world's largest energy consumer, China's current and future economic growth has profound implications regarding the preservation of

the environment. That said, perhaps China does not have the same luxury as the West; it cannot grow now and deal with the aftermath later, but rather must address such pertinent environmental issues in real time. Steven Tsang, professor of contemporary Chinese studies and director of the China Policy Institute at the University of Nottingham, explains that, in the Chinese context, “while adverse climate change impacts are increasingly recognized as a threat, the negative impact on economic development [protective environmental measures would entail] is still the over-riding priority.”⁴³ The worsening air and water pollution and rapidly rising carbon dioxide (CO₂) emissions that have plagued the Chinese landscape have been seen by many analysts as a regrettable but inevitable cost of the country’s economic rise.⁴⁴ To change this, there would presumably need to be a complete regulatory overhaul of many of China’s economic sectors. This of course, would be incongruent with growth and the current agenda.

In particular, the domestic use of coal has largely contributed to the problem. Coal is cheap (14 to 27 times cheaper than oil) and abundant (114.5 billion tonnes of recoverable domestic coal) in China.⁴⁵ Coal must be burned and processed in order to harness its energy potential. Doing so releases CO₂ into the atmosphere, which is toxic to the respiratory, nervous, and cardiovascular systems, and leads to the acceleration of global warming.⁴⁶ The ubiquitous and ominous smog that covers many of China’s major urban centres caused by CO₂ emissions, was found in one study to potentially cut life expectancy by five years.⁴⁷ This is, of course, distressing and deplorable socially as well as environmentally.

Coal, like oil and natural gas, is categorized as a fossil fuel. At present, transitioning from these types of energy sources to renewable energy ones has found little success and in the past, has not received much support from government and industry due to a lack of financial incentives.⁴⁸ Lucia Green-Weiskel, with the Innovation Center for Energy and Transportation, a Beijing based non-profit think tank concerned with clean transportation, sustainable development, and carbon management, outlines three considerable recent developments that indicate that China may continue to be heavily reliant on these fossil fuels. First, the current administration led by Xi Jinping has moved away from the conservation-orientated approach favored by his predecessor, Hu Jintao “toward a model marked by increased privatization, including tax cuts for private enterprises, relaxed political controls, programs to boost domestic consumption and intensified resource exploitation.”⁴⁹

Second, The International Energy Agency has reported that discoveries of shale gas combined with new drilling technologies will make the United States the world’s largest oil producer by 2020, which will open up new and vast Middle Eastern and Central Asian reserves to China.⁵⁰ Third, a recent increase in sales of larger gas-powered vehicles in China has stymied the development of electric-powered vehicles, which at one time had a most promising future.⁵¹ Additionally, as we have seen, China represents the world’s largest manufacturing-for-export market and, as such, each ‘Made in China’ product contains oil either directly or indirectly.⁵² As such, the need for oil is imperative to the sustenance and development of the Chinese economy, obviated by the fact that ‘Made in China’ export products accounted for over 80 million tonnes of oil, with the majority stemming from the manufacturing of communication equipment, computers, and other electronics in 2011.⁵³

However, one thing is certain: China, in its delicate balance of economy and environment, “cannot afford to do what the West did: grow fast now and clean up its mess later”⁵⁴ for it operates at present, in a socio-political-economic climate where a process of rapid industrialization must take into account the health of the planet. Of course, this is easier said than done. China’s reliance on fossil fuels alone indicates immense challenges.

The situation may not be not all bleak, however. Indeed, there is cause to be optimistic that China has made and will continue to make commitments to environmental preservation. Robert Marks, a Chinese historian, explains there is a long-standing history in China concerning “the idea that political authority has a fundamental responsibility for maintaining a harmonious relationship between society and environment.”⁵⁵ This sentiment has been actuated, in recent decades, at least to a degree. In 1973, China held its first National Conference on Environmental Protection. In 1978, Chinese leaders incorporated a concern for the environment in its constitution, and in 2000, the Chinese government included environmental protection and sustainable development as objectives in its official economic strategy.⁵⁶ In fact, the ratification of the Energy Conservation Law (2008) has led to the implementation of over 164 conservation activities to “promote energy saving efforts in [Chinese] society... increase energy efficiency and protect the environment.”⁵⁷ Among the measures taken thus far include: a commitment to reduce energy consumption per gross domestic product unit by 13%, or 800 million tonnes of CO₂ by 2020,⁵⁸ a concerted effort to

develop wind and solar technology,⁵⁹ the construction of energy efficient ‘green buildings’ translating to a reduction of up to 700 metric tonnes of CO₂ emissions and up to 300 million tonnes of oil by 2030,⁶⁰ a move toward a carbon emission trading scheme,⁶¹ a rise in electricity prices for energy-intensive industries,⁶² and an imposed tariff system ranging from 5 to 10 percent on 142 export goods classified as energy intensive.⁶³ Such efforts (in theory) demonstrate China’s political apparatus as being in tune with modern realities. Given the evidence cited thus far, this move towards a concern for the environment may be in reality a perception, a political gesture. Compared to many industrialized nations, it seems to be in a stage of infancy. This is a topic of research that must be followed closely over the coming decades. At present, there is no easy solution. A complete desertion of fossil fuels in the energy sector is unrealistic. As long as coal, oil, and natural gas remain abundant and economically feasible, China (and the rest of the world) will use them.

A New Source of Energy: Canada’s Oil Sands

China’s insatiable appetite for energy has and continues to dictate its economic, political, and, to a lesser extent, environmental policies. We have noted that the Chinese government has indiscriminately sought out and secured its interests globally. Doing so has shown in many ways a prioritization of China’s economy over a concern for the environment. Canada is one example of this particular and keen interest. China recognizes that potential Canadian energy exports could satisfy a large portion of its oil and natural gas needs. This is because, at present, “Canada is experiencing a dramatic revolution in its hydrocarbon sector.”⁶⁴ In fact, the Canadian Association of Petroleum Producers forecasts a doubling of oil production by 2030, reaching almost seven million barrels per day.⁶⁵ In large part, this is due to the discovery of the Alberta oil sands (having the potential to produce 5.3 million barrels of oil per day) and vast shale formations (holding an estimated 16 trillion cubic metres of recoverable shale gas) that have been developed and functioning since the late 1960’s. As such, China has made substantial investments in Canada’s oil sector.⁶⁶ PetroChina, China’s largest oil and gas producer and distributor holds shares in both shale gas blocks and oil sands projects, CNOOC acquired Canadian energy firm Nexen in 2013, and Sinopec has spent roughly seven billion dollars in Canada’s energy industry.⁶⁷ Moreover, Canada has a particular need to export abroad as it is currently being squeezed out of the U.S.

market due to the aforementioned ramp in U.S. domestic energy production.⁶⁸

The next plausible move for Canada is the construction of pipelines. The proposed Enbridge Northern Gateway Pipeline, in particular, would travel 1,117 kilometres from the Alberta oil sands to the head of an 80 kilometre-long inlet known as the Douglas Channel in Kitimat, British Columbia.⁶⁹ Once constructed, “approximately 225 tankers per year would be hauling 2-million-barrel payloads to supply Asia’s awakening energy markets”⁷⁰ at a rate of over half a million barrels of bitumen (crude oil) per day to be refined primarily in China.⁷¹ Enbridge’s project (along with selling oil to China) has been touted by Canadian Prime Minister Stephen Harper as a “National Priority.”⁷² There is no question, economically speaking, that selling Canadian oil to China could pay huge dividends. The Northern Gateway project alone, Enbridge claims, “would contribute \$270 billion to Canada’s GDP over 30 years and pay taxes and royalties of \$8 billion.”⁷³ On a smaller scale, and over the past five years, oil-tankers have been leaving Kinder Morgan’s Vancouver terminal en route to Chinese processing refineries.⁷⁴

While the Chinese government posits that Canada’s sale of oil and natural gas is beneficial to both parties and is even imperative to China’s growing demand for energy, there remains a strong opposition among Canadians, at least where the Northern Gateway is concerned. A coalition of municipal governments, landowners, First Nations communities (notably the Carrier Sekani Tribal Council, a representative body comprised of eight First Nations tribes from British Columbia), and environmentalists have aligned themselves against the project.⁷⁵ Troubled by BP’s Gulf of Mexico blowout and Enbridge’s own pipeline mishaps in the US, this coalition, writes Gary Park, a Canadian Correspondent with the Petroleum Economist, is vehemently opposed to the proposed overland pipelines and oil-tanker traffic that must navigate the treacherous waters off the British Columbian coast.⁷⁶ So, not only has China endangered the environment domestically (burning of fossil fuels within its border), it likewise, through potential economic opportunities and trade with Canada, has opened up a whole new set of environmental risks that could be devastating a world away across the Pacific Ocean. To be fair, the issue extends further than pipe malfunctions and tanker spills. Kirsten Zickfeld, assistant professor of geography at Simon Fraser University, explains that the project will facilitate substantial greenhouse gas (GHG) emissions that will not only impede Canada from reaching targets established by the

Copenhagen Accord, but will have adverse effects on global warming and thus also climate patterns⁷⁷ while signaling a reliance on (and complacency over the use of) fossil fuels for the next century.⁷⁸

Furthermore, Robyn Allan, a prominent Canadian economist, claims the project will actually hurt Canada’s economy. She explains that construction of the Northern Gateway Pipeline will impose a two to three dollar price increase per barrel of oil, leading to a reduction in total GDP, a loss of competitive advantage found in having access to cheap energy feedstock, an increase in unemployment, a decline in government revenues, an increase in inflation, and an increase in interest rates, and it will put adverse pressure on Canadian citizens’ incomes.⁷⁹

There are also complex issues surrounding indigenous land use within the framework of Canadian law that have yet to be fully resolved, and which have resulted in several organized protests, culminating with a march on Enbridge’s annual shareholder meeting in downtown Toronto in 2012.⁸⁰ The Carrier Sekani maintain that their territorial and traditional rights are belied by the Enbridge application in the name of potential economic opportunity.⁸¹ Representative members contend a solution may only be found through “reterritorializing the geographies of resource development and environmental governance by stretching the geographic responsibilities of Carrier law, and engaging companies and governments as subject to this traditional body of law.”⁸² These are but a few examples of the vigorous and steadfast opposition to the Northern Gateway Project. Nonetheless, they illustrate the fragmentation of the project’s stakeholders and the various positions involved.

Conclusion

China needs energy now. It has experienced immense growth in a multitude of ways. Its leviathan manufacturing sector and tremendous population will only continue to expand. With such growth, first and foremost, comes the need to achieve an intricate balancing act of economic prosperity, securing of interests abroad, political legitimacy, and environmental consciousness. The lynchpin is energy. The Chinese government should take the necessary steps to ensure that future generations’ and the environment’s well-being are among its greatest priorities. Fortunately, China’s geo-political and newfound economic position puts it in an advantageous position to do so. China can look outward to the accomplishments of Western nations, yet it should likewise look inward and revel in the great leaps it has made

in such a short time span. Conversely, Western countries should promote cooperation with the Chinese. They should open dialogues about sustainable energy development and socio-political harmony. Some Western nations may characterize China as closed or predatory yet these same nations adopted similar measures, if not worse during their industrializing phases. The world’s energy resources are finite. This is exceedingly clear given the marriage of supply and demand with world oil prices and economic growth. We should be just as cognizant of the fact that our habitable environment is likewise finite. Given that the Chinese economy will in a few short years surpass the United States’, and that China is a permanent member of the UN Security Council, it finds itself in a position to the lead in both the development of and acclimation to new energy sources or strategies and environmental preservation.

China has been highly motivated in seeking out and securing energy sources as part of a national policy so that it may meet the demand imposed by an unprecedented economic surge. The current administration, however, which operates in a political climate that holds nations responsible for their actions to a greater degree than in the past, can and must do more to ensure that the preservation of the environment receives sufficient attention in their economic and political agenda. In the interim, China has a vested interest in Canada’s energy sector, most notably the Alberta Oil Sands. As we have discussed, Canada will become more heavily dependent on Asian export markets as its traditional energy partner, the United States, is forecasted to become near energy sufficient in the coming decades. So, the proposed Northern Gateway Pipeline represents a monumental centerpiece of an ongoing, mutually prosperous Chinese-Canadian economic relationship. There is, of course, a concerted opposition to the project; from environmental activism to economic protectionism, yet all signs point to the project being inevitable. With this, China has legitimated its goal of securing energy sources abroad in a 21st century globalized economy as well as strengthened its ties with the West.

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Elementary teachers' expectations and perceptions of school counselors

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Abstract

This qualitative study explores the expectations and perceptions elementary teachers have of school counselors. Participants were current or past students in an elementary education graduate program at a southeastern university. The participants responded to an open-ended online survey that consisted of questions that focused on the demographics of their schools and the expectations and perceptions they had of the school counselor's roles and responsibilities pertaining to both academic achievement and student behavior. Although responses varied, the data suggests that there was substantial concern regarding the time and availability of the school counselor, implications of the use of counselors as school standardized testing administrators, and respondents' desires for school counselors to focus on the severe emotional and behavioral needs of students.

Introduction

Since its introduction in the late nineteenth century, school counseling has undergone many changes.¹ Accompanying these changes have been significant conflicts pertaining to the actual versus perceived roles of school counselors. Burnham and Jones emphasized that school counseling roles are often problematic by definition.² The perception of school counselors from various professional stakeholders includes seeing the school counselor acting as an "educational leader, student advocate, and social change agent," while others suggest the role encompasses disciplinarian, administrator, and behavior manager.³

Counselors are given job descriptions they are expected to follow. Literature suggests that some descriptions of the school counselors' expected roles and functions from various stakeholders overlap those described by school counselors, however some elements differ. These differences can be perceived as limitations of working with a school counselor or, in some situations, the perceived ineffectiveness of school counselors.

The perceptions and expectations elementary school teachers have of school counselors may play a major role in defining the preferred or expected duties of an elementary school counselor. As previously mentioned, these perceptions and expectations tend to vary. A qualitative survey exploring perceived expectations and perceptions of their elementary school counselors was designed to further explore the expectations and perceptions of school counselors within the mentioned geographical region. The survey was

presented to thirty-eight past or present elementary education graduate students from a southeastern university. Six participants responded to the ten-question survey. The following provides an overview of previous research that focuses on the roles of school counselors, a detailed description of the study, and the themes that were derived from the study:

Literature Review

History of school counseling

Counseling first found its place within schools in the late nineteenth century when Jesse Davis introduced a counseling program in a Detroit high school.¹ The goal of Davis' program was "to help students develop character, avoid problems, and relate vocational interests to coursework."⁴ Due to the industrialization and urbanization at that time, there was a heightened awareness of the need for vocational counseling in schools.⁴ After the implementation of the first program, vocational counseling began to evolve to school counseling. Frank Parsons, often referred to as the father of guidance, is credited with creating this movement.^{1,5} Parsons paired his attention to vocational guidance with his concern for society's failure to provide adequate resources for the growth and development of children.¹ Dahir and Stone state that Parson, and those who followed him, emphasized the ideas that individuals must understand their individual abilities, goals, and weaknesses; individuals must have a knowledge of the world around them, the opportunities and options it holds, and what each opportunity and option requires; and, individuals must combine knowledge of self with awareness

of the world around them. Counselors serve as guides to help individuals meet these goals.¹ Gybers and Henderson described the transformation from vocational guidance to school counseling as a movement from a position to a service to a comprehensive program.⁵

When counseling was introduced into schools, teachers were often appointed to the position of vocational counselor. This position rarely came with relief from common teaching duties or increased pay.⁵ School counseling was not considered a profession until the mid-twentieth century. This accomplishment was marked by the formation of the American School Counselor Association (ASCA) in 1952.⁴

Over the past several years, the number of school counseling programs has increased. Although many school counselors believe they have been excluded from conversations focused on changes in curriculum and instruction, school counseling has undergone major transformation. Schmidt, Lanier, and Cope state that the increase in school counseling programs is a result of legislation including the Elementary and Secondary Schools Act, Public Law 94-142, currently No Child Left Behind, and *A Nation at Risk* which created a focus on the accountability of schools.⁶ Schmidt, Lanier, and Cope further suggest that societal changes and student challenges have increased the awareness that all students benefit from comprehensive counseling programs. As policies and school reform initiatives continue to be introduced (e.g. Race to the Top, Common Core, and a forthcoming revision to the Elementary and Secondary Schools Act), the role of school counselors remains relevant for students,

teachers, and schools.

Children's need for school counseling

Connolly and Protheroe state, "today's schools are judged by what their students know and are able to do. Local, state, and national accountability mandates send the clear message that it is no longer acceptable for significant segments of the student population to be underserved."⁷ However, this change in focus that has occurred from *some students succeeding to all students succeeding* comes during a time of smaller budgets, declining revenues, and fewer resources.⁷ Although the resources, such as finances and assistance programs, might not be readily available, children's needs for school counseling remain. According to Dahir and Stone, many students have to face physical, emotional, social, and economic barriers that can inhibit successful learning.¹ Christiansen stated that more and more children are becoming "at risk" for failure in school as a result of family structure, violence, abuse and neglect, and a variety of disabilities.⁸ He recommends that school counselors and teachers work together to help students overcome the obstacles in their path by offering mentoring, utilizing students' special hobbies and interests, creating positive relationships among significant adults and students, and developing family support.⁸ Further, he suggests that school counselors and teachers play a vital role in carrying out the above mentioned tasks, but only by understanding the school as an entire entity can counselors help meet the complex needs of students that teachers might not be able to do on their own.

According to Weissberg and O'Brien, one particular challenge that faces twenty-first century schools is the large number of students who have high social and emotional needs, experience mental health problems, and engage in harmful activities such as substance abuse, violence, and other self-destructive behavior.⁹ During elementary, school students develop many social skills during classroom instruction and counseling.¹⁰ According to Gallagher, teachers and counselors are encouraged to support the development of social skills. All activities are designed to encourage students and decrease frustration, which opens a path for success. Weissberg concurs that social and emotional learning addresses the needs of children and the fragmentation that frequently exists in schools.⁹ Research in the past three decades has shown that social and emotional learning skills can be taught through programs offered by individual schools. Dahir and Stone provide several examples of the impact school counseling has on students.

Research suggests that high-quality counseling services can have long-term effects on a child's well-being and can prevent a student from turning to violence and drug or alcohol abuse. High-quality school counseling services can also improve a student's academic achievement. Studies on the effects of school counseling have shown positive effects on student's grades, reducing classroom disruptions, and enhancing teachers' abilities to manage classroom behavior effectively. High quality school counseling services also can help address students' mental health needs.¹

Dahir and Stone continue by stating that even though several federally-funded programs such as Gaining Early Awareness and Readiness for Undergraduate Programs (GEAR UP) and the Elementary and Secondary School Counseling Demonstration Act (ESDA) have been implemented and drawn attention to the effect school counselors have on the lives of students, much more must be done to evaluate the effectiveness of school counseling programs.¹ Worzby and O'Rourke posit that the events that happen to elementary school students during the early stages of development will have an impact on their coping behaviors later in life. They continue by suggesting that "an elementary school counseling program is designed to assist the school and community in addressing the full range of variables affecting the teaching/learning process, from meeting children's needs to creating new growth to producing learning environments for them."¹¹ Clark and Amatea place emphasis on this point by noting that "educators are recognizing that when schools attend to students' social and emotional skills, the academic achievement of children increases, the incidence of problem behaviors decreases, and the quality of the relationships surrounding each child improves."³

Overview of the perceptions, expectations, and actual role of school counselors

Burnham and Jackson state that "school counseling roles are often problematic in definition, interpretation, and implementation."²² Counselors today are expected to fulfill the traditional roles that pertain to school and career counseling, host consultations with parents and faculty, organize student registration, administer several required tests, provide professional development, supervise staff members, and conduct administrative tasks.¹² Ford continues by stating that, due to the student-to-counselor ratio (561:1), school counselors serve a major role in schools. According to Clark and Amatea, the perception of the school counselor from various parties

includes seeing the school counselor acting as an "educational leader, student advocate, and social change agent."²³ While trying to fulfill the required and requested roles, school counselors are asked to distinguish priorities for the programs and then follow up by implementing those priorities.¹³

Even though counselors have a well-known presence in school districts across the states, this particular profession was omitted from many of the educational reform movements of the past.¹ However, advocates are hoping this will change. Dahir and Stone present the changes that have occurred in defining the role of the school counselor by listing the traditional role focus and the transformed role focus of school counselors in a comparison chart. Role foci such as "individual students' concerns and issues, student scheduler, primary focus on personal and social development" have been transformed to "proactive prevention and intervention for every student, develop a program of study with student based on education and career goals, and academic career and personal social development."¹ Worzby and O'Rourke (1989) state that the primary purpose of school counseling programs is to "enhance and improve the learning environment of the school so that each child in the elementary school has an opportunity to learn the best of his or her capacity." In turn, school counselors have the duty to intervene in the students' lives and intervene in the learning environment within schools to ensure that children learn to become free and responsible.¹¹ Typical roles designated to the school counselors are those such as group and individual counseling, interpreting test results, tending to children's concerns, and leading classroom guidance activities.¹⁴ Cooper, Hough, and Loynd state "that counseling is going to work best when the basic attitudes and principles of counseling inform the whole school."¹⁵ Wilgus and Shelly advocate that "what is needed are counselors who are action oriented, not reactive; creative, not complacent; aggressive, not passive; and energetic, not lethargic. Commitment is required."¹³

Counselor's description of their job duties

While teachers and principals have varying expectations and perceptions of the school counselor roles, counselors tend to have their own beliefs about their job duties. Ginter, Scalise, and Presse indicate that an issue faced by most counselors is the specific duties they are supposed to perform, and the effectiveness of the counselor's job can be altered by conflict between the counselor's definition and other parties', such as principals and teachers definition of

the counselor's role.¹⁴ In their study, Wilgus and Shelley questioned school counselors from seven elementary schools in the about the definition of their role.¹³ After the counselors responded, staff members were asked to describe the counselor's role and rank the jobs as what seemed to be appropriate and then the duties that they deemed as inappropriate. The following groups of job duties were derived after the school counselors were asked to describe their role: parent education, guidance and counseling-oriented meetings, non-guidance and counseling-oriented meetings, individual counseling, group counseling, classroom programs, recognition programs, staff consultation, individual testing, group testing, staff development, referrals, classroom observation, and parent contact. There were also a number of activities that did not fall into any of these categories. These particular duties fell into a category labeled as "Other". Some duties the counselors include while describing their job are identical to those of the other staff members, such as teachers, while others tend to differ.

Teacher perceptions and expectations of school counselors

Due to its long history, there is much research that surrounds the topic of school counseling. The topics of this research vary in nature, but more salient to this research surrounds perceptions and expectations of the school counselor's role. The role of the school counselor can be explained differently depending on who is describing it.

Of all the perceptions and expectations that surround the role of the school counselor, the ones teachers hold have a high importance due to the fact that teacher perceptions and expectations also influence the perceptions and expectations of principals, parents, and students which, in turn, affects the counseling program.¹⁶ On a day-to-day basis, teachers see the impact situations have on each of their students. According to Cooper, Hough, and Loynd there is a crossing point that exists between education and therapy and teachers stand at this point. It is also stated that "teachers represent the largest body of professionals on whom the success of a school-based counseling service is likely to depend."¹⁵

Counselors as collaborators

Past research suggests that teachers hold an overall positive view of the school counselor and see school counselors as a much needed resource.¹⁵ Educators are beginning to recognize that as students' emotional and social needs are attended to, the academic achievement, behavior, and quality of relationships tend to increase

for students.³ School counselors act as an independent presence in the school that allows students to have someone to discuss problematic or troubling situations with that is not a typical party such as a parent or teacher.¹⁵

There are several roles of the school counselor that are held in high importance to teachers. Clark and Amatea propose that one major role of the school counselor is that of teacher consultation that will help students have higher achievement levels in school. As a result, there has been an increased emphasis on the counselor's role and impact on academic achievement. Results from their survey revealed that thirteen out of the twenty-three participants discussed the necessity of collaboration where teachers and counselors worked together as a team. Clark and Amatea continue by explaining that this emphasis makes it clear that collaboration with teachers is necessary in order to provide the best services for students pertaining to their academic and career development and social needs.³ Bemak states "it is critical that school counselors work closely with other professionals in the school."¹⁷ While this includes stakeholders such as administrators, it also includes teachers. As Bemak's description of appropriate collaboration continues, he states that working closely with teachers should include, among other things, observing and discussing classroom performance and helping invent and provide academic-support programs that address academic and social needs.¹⁷ Reiner acknowledges the fact that teachers support collaboration and many other activities as some of the appropriate responsibilities of the school counselor. However, the teachers felt as though counselors never or rarely took part in a portion of the appropriate activities. Among these activities was collaborating with "teachers to present guidance curriculum lesson, present proactive prevention-based guidance curriculum lessons, and provide teachers with suggestions for better study hall management."¹⁶ Collaboration and strong relationships between teachers and counselors, as well as administrators, are fundamental factors in a school's effectiveness.³

When counselors are viewed as collaborators, it is not only collaboration with teachers, but with principals as well. Connolly and Protheroe theorize that when school counselors collaborate with administrators as well as other school faculty on topics such as effective learning environments, the amount of work that needs to be completed becomes more manageable. Connolly and Protheroe continue by stating that one very effective way for school counselors to collaborate with administrators and teachers

is to use the distributed leadership model, and by providing steps on how to carry out effective collaboration.⁷

School counselors as administrators

In their study focusing on teacher perceptions of the professional school counselor role, Reiner, Colbert, and Perusse state that "there are few significant differences between school counselors and their respective school principals."¹⁶ They continue by indicating that the inappropriate tasks that principals typically rated as appropriate for the school counselor are registration and scheduling, administering achievement tests, and maintaining student records. Typically, these tasks are considered to be administrative duties. Reiner, Colbert, Perusse state that eighty percent of principals endorsed these tasks for the school counselors in their schools.¹⁶ Burnham and Jackson discuss Myrick's Model, which describes six direct and indirect counseling services. These services include individual counseling, small group counseling, classroom guidance/large group guidance, consultation, and peer facilitation.² The authors state that, according to Myrick, administrative duties, an area in which many counselors do not have much experience, can inappropriately take up fifty percent of a counselor's time.² When counselors do not have much clerical assistance, such as the counselors in Burnham and Jackson's study, valuable time can be taken away from the actual roles of the counselor.²

Methods

Participants

The participants of this study were graduate students at a southeastern university. This population of participants was selected in efforts to reach new and veteran teachers who are invested in advanced degrees. An email list was generated to target the desired participants. To ensure confidentiality, the participants were asked to omit the names of their geographic area, schools, counselors, and any other identifying information from their survey responses.

Request of participants

Upon receiving the correct authorizations from the Institutional Review Board, information about the research was sent out via email. This email described the purpose of the research, information about the principal investigator, and the goal of the research. The original email was sent to thirty-eight potential participants. After a two-week time period, the same thirty-eight participants received a follow up email explaining that this second email served as a last request for participation. Both

emails described that by completing and submitting the survey, participants provided their informed consent and therefore granted permission for their responses to be considered within the results. A total of six participants elected to participate in the research.

Method of research

Data were gathered via a survey that consisted of ten closed- and open-ended questions that included demographics of each school as well as the participants' expectations and perceptions of the school counselor's role. Each participant received an email that explained the design and purpose of the research and also contained the link to the survey. After providing the response to each question, the participants submitted the response. Each submission was completely anonymous. Participants' responses were simply labeled with a number that did not provide any identifying information. The survey is included in the appendix and outlined in the following section.

Data analysis

All six responses were compared, coded, and analyzed. This was completed by analyzing the response to each of the ten questions and placing the surveys in groups that contained similar responses. These similarities were noted using a color-coding scheme. Fraenkel, Wallen, and Hyuan define a coding scheme as a "set of categories that an observer uses to record the frequency of a person's or groups behavior."¹⁸ For example, question one asks how many years of experience the respondent has as a teacher.

When comparing all surveys, one color was selected for one to five years of experience, five to ten years of experience, ten to fifteen years of experience, and more than fifteen years of experience. The colors were noted on a coding key. Each survey response was evaluated and coded with the correct color. Each survey question was evaluated and common themes were listed. Colors were then assigned to each common response. If a response did not fit into a common theme, it was marked with a different color to signify that it differed from the rest. After the surveys were divided into these groups, notes were typed to facilitate the comparison of responses of each participant.

Results

Response rate

Six out of the thirty-eight original contacts responded to the survey questions. The total response rate was 15.7%. Due to the sample selected, each respondent had some type of elementary education background. Therefore, each participant's responses were considered when analyzing the data, regardless of their placement at the time the research was completed. Five out of the six respondents responded to every question. The last respondent chose to skip questions six, seven, and ten. Pseudonyms have been used to report and explore the comments of each respondent (Amy, Jesse, Emma, Gabe, Charley, and Toby).

Question responses

The responses to questions one through four are provided in the Table 1.

Question 5: Are you encouraged to work with the

school counselor? If so, how?

All six respondents responded to this question. Amy and Jesse stated that they did not feel as though they were encouraged to work with their school counselor. However, Emma, Gabe, and Toby felt as though they are encouraged to work with their school counselor in various ways. Toby stated that although the counselor is present mostly for the upper grades, he is encouraged to work with the counselor during Bully Prevention month. Toby continued by stating that he knows the counselor is available to him as well as the students whenever needed. Similar to Toby, Gabe stated that he works with the counselor for testing services due to the nature of his position. Contrary to Gabe and Toby, Emma felt as though "teachers are encouraged to contact the counselor when behavior or issues at home causes problems with student learning." Charley did not provide insight to this question due to not having a counselor at her school.

Question 6: In what ways, if any, has the school counselor worked with your students?

Only five respondents replied to this question. Due to not having a school counselor, Charley answered this question by stating that it was not applicable. Amy stated that the school counselor sees many of her students on an individual basis. Similarly, Gabe stated that one of the students has been referred to the school counselor to receive individual counseling due to the student's family facing a divorce. Jesse and Emma were very detailed in their descriptions of how the school counselor works with their students. Jesse stated that

| Question | Amy | Jesse | Emma | Gabe | Charley | Toby |
|---|---|---|--|---|------------------------------|---|
| 1. How many years of experience do you have as a teacher? | 6 years | 3 years | 1 year | 17 years | 5 years | 4 years |
| 2. What grade level/ subject areas do you teach? | K-3 Special Education | 3rd Grade. The respondent has also taught 2nd grade. | 4th grade math | Reading and math for grade 1-8 | 7th grade language arts | Pre-K/K |
| 3. Briefly describe the demographic of your school. Please do not identify the school by name. | Predominately white with 75% poverty rate | "My school is in a rural county. Ther is a high population of economically disadvantaged children in my school as well as the county. There is not much radical diversity in my school. | "The school is very low income with a 90% non-white population. A large part of the student body comes from broken homes and are on some type of government assistance." | "K-12 in one building; Mostly white/about 10% minority; Not many on free and reduced lunch. About equal with boy/girl ratio." | "Mostly Caucasian students." | "At least 85% poverty, 95% white, 3% Hispanic, 2% African American, 1% Chinese" |
| 4. Does your school have a counselor/ guidance counselor? If so, how many? Please do not identify counselors by name. | One part-time counselor | "My school does have a guidance counselor. We also recently have received a counselor from a facility that is outside of the school that works with people that have emotional/mental disorders." | "Yes, a guidance counselor. One actual counselor and an assistant principal who also handles discipline problems." | "Yes - 1 (several assistants). | No | "Yes, only one." |

Table 1. Responses to question 1-4

the counselor has guidance classes with his students. However, the counselor typically reads a book or has the students color or watch a movie. Jesse continued by declaring that the school counselor is not present at school due to them missing a lot of days, and they do not get a substitute. Guidance only occurs during half of the year in this setting. Jesse ended by stating that the counselor does help students get food bags if they are in need. Similar to Gabe, Emma stated that the school counselor has seen students with anger issues. The counselor has worked very closely with one student in particular. However, there are several other students who are facing situations in which counseling was needed due to issues at home or problems in school regarding attendance or behavior.

Question 7: What assistance, if any, do you expect from a school counselor in regards to helping students gain academic achievement? In what ways has this been helpful or not to the academic achievement of your students?

Five out of six respondents responded to this question. Amy stated that this question was not applicable. Jesses expressed that he did not expect anything from the counselor in regard to academic achievement. However, he continued by declaring that the counselor does try to assist students in gaining high achievement on TCAP testing by playing a BINGO game about how to act during testing. Emma and Charley had similar responses. Both mentioned that the counselor is present to help students with issues or problems that might be interfering with academic achievement. Emma stated that many times, the counselor is there to help students work out problems such as facing parents who are in jail or do not have custody, as well as issues of bullying. Charley states that counseling students with social issues can help students set their insecurities aside and focus more on academic achievement. Gabe stated that the counselor tends to “stay on top of students” at the high-school level by assisting with college representatives and being readily available for all students.

Question 8: Do you feel that it is within a counselor's duties to help students with behavior issues in the classroom? If so, how do you believe this should be achieved?

All six respondents provided an answer to this question. Every respondent stated that the school counselor could be used to assist with students' behavioral issues. However, responses varied based on to what extent this should be part of the counselor's duties. Amy stated that if the counselor is able to perform these duties, then they should be invited to do so. Jesse expounded on this

by saying that the counselor should meet with the teachers and help come up with new ideas regarding how to handle behavior issues. In agreement with Amy and Jesse, Gabe said that this should definitely be a duty of the counselor, especially in the younger grades. He continued by placing emphasis on character education. Emma, Charley and Toby emphasize that the counselors focus should be on those students who have social or emotional needs. However, they state that when these issues become a distraction in the classroom, the counselor should step in and help handle the behavior issues. Charley, as well as Toby, states that this can be best achieved by individual counseling.

Question 9: What is the primary contribution, if any, you feel that a school counselor provides for you as a teacher, the students, and the school as a whole?

Every respondent replied to this question. Amy, Jesse, and Emma felt as though the primary contribution of the counselor should be to help students with needs that go beyond the classroom. Respondents stated that this could be anything from emotional/social issues to issues at home. Jesse and Emma stated that the counselor could also work closely with the teacher to address issues in the classroom. Toby felt as though the counselor served as a mediator between students as well as between students and teachers. Additionally, two respondents stated that they felt as though the counselor's primary contribution is in the planning and execution of administrative duties within the school.

Question 10: What are the challenges and limitations, if any, of working with a school guidance counselor?

Only five respondents responded to this question. The answers varied. Amy, Jesse, and Gabe shared their concern about the amount of time that counselors were available. This was because of the counselor: student ratio, only having a part-time counselor, or the counselor being absent and not requesting a substitute. Charley agreed by stating that the counselor was responsible for too much paperwork to have adequate time to work with students. Emma stood out by responding that the biggest limitation of working with a school counselor was the fact that sometimes, the school counselor was not approachable. She stated that if a counselor is not approachable, students and teachers tend to feel as though they cannot receive they help the need.

Discussion

Two potential themes arose from the responses submitted by each participant. This section describes these two potential themes and their relationships to previous

literature. Strengths and limitations of the research and implications for further research are also detailed.

Theme 1: Limitations of time and testing demands

Time management of the school counselor was a major concern for teachers in this study. The counselor-to-student ratio within many schools causes concern particularly in regards to the fulfillment of the school counselor's duties. This is not taking into consideration that many times, counselors are expected to fulfill other duties such as testing, class scheduling, and administrative tasks. In the responses to the survey, each respondent mentioned the limitation of time placed on the counselor at each school. Four respondents stated that one major limitation of working with their school counselor was the amount of time that the counselor was available to work with students and/or teachers. This could occur because of paperwork or part-time counselors. Amy works within a school that only has one part-time counselor. This further limits the availability of the counselor. Other respondents stated that the counselor is typically busy fulfilling test administration duties or scheduling procedures.

Ford states that counselors today are expected to fulfill the traditional roles that pertain to school and career counseling, host consultations with parents and faculty, organize student registration, administer several required tests, provide professional development, supervise staff members, and conduct administrative tasks.¹² Ford continues by stating that the due to the student-to-counselor ratio (561:1), school counselors serve a major role in schools. These responsibilities further limit the time available for teachers to collaborate and communicate with the school counselor. If teachers feel as though counselors are too busy to fulfill the needs of teachers and students, then these needs can begin to be ignored. While counselors can be responsible for some testing and administrative duties, the main focus should be the needs of students and helping teachers meet the needs of each student. This can come about through individual counseling sessions or small-group counseling. If school boards and administrators wish for school counselors to fulfill both administrative tasks as well as meet the needs of teachers and students, more counselors need to be provided. Teachers will be more apt to communicate with counselors if they feel as though their needs and wants are going to be addressed. This cannot happen if counselors do not even have the time in a given day to listen to the teachers and/or students. By providing more counselors or shortening the

list of responsibilities placed on the school counselor, time will be able to be better managed thereby allowing the needs of teachers and students to be addressed.

Theme 2: Focus on students in need

In this research, the responses provided by the six respondents indicated that a deliberate focus on students in need was imperative. These needs could include anything from helping students facing the divorce of parents, their social or emotional needs, or troublesome home lives that impact the behavior and academic achievement of these students at school. These barriers can inhibit successful learning. Christiansen states that more and more children are becoming at risk for failure in school as a result of many factors including family structure, increased violence, abuse and neglect, and a variety of disabilities. These barriers can affect student achievement, behavior, and social and emotional competency.⁵

Students who struggle with the needs previously mentioned are considered to be a priority expectation of school counselors in the data of this research. In response to how the respondents are encouraged to work with the school counselor, Emma states “teachers are encouraged to contact the counselor when behavior or issues at home causes problems with students’ learning.” Respondents Emma and Charley mentioned that the counselor is present to help students with issues or problems that might be interfering with academic achievement. The respondents continued by stating that these issues could include social and emotional issues as well as parents divorcing. When asked about the suggested primary contribution of the school counselor, many respondents stated that the counselor should help students with needs that go beyond the classroom such as emotional and social issues as well as issues at home.

There is definitely a need for counseling intervention regarding major situations that can cause inappropriate emotional and social behavior or distractions in the classroom. On the other hand, what about the students who do not struggle from this degree of difficulty? Are these students’ emotional needs considered by the counselor or classroom teachers? As shown in the results of this study as well as previous research, much focus is placed on the major social and emotional needs of students. While these needs are becoming more common in schools, there are some students who do not face these issues who would still benefit from counseling. These can be students who struggle with low self-esteem, confidence, as well as many perceived “minor” issues that tend to be overshadowed by the

more significant needs listed above. How would academic achievement school-wide be impacted if all needs were addressed, including minor needs that are not as evident as some of the major needs mentioned above? If students facing minor issues perceive the counselor to be focused solely on students with high needs alone, they could begin to feel as though their needs are not worthy to be considered by someone else. In order to reach the goals, such as overall achievement, that have been set by school districts across the country, every student’s needs should be considered, both major or minor.

Some schools are beginning to address this by adding part-time counselors from outside companies specializing in more significant needs of students. This opens up time for students who do not suffer from more severe social and emotional needs to see the counselor for their needs as well. However, if teachers characterize the counselor as someone who is there to serve only a certain population of students, some students might interpret this as though the door of the counselor’s room is closed to them. This can lead to more severe emotional and behavioral issues due to minor issues being ignored and overlooked. Teachers and counselors should collaborate on the needs of each student. This will allow for all students’ needs to be addressed regardless of the severity of each need.

Strengths of the study

This research provided qualitative data on the expectations and perceptions that elementary teachers have of elementary school counselors. The information gained from this research allows educators, counselors, and administrators to understand the strenuous demands that can occur from varied perspectives and expectations. This allowed for a focused study into the expectations and perceptions of teachers in this area. Quantitative data would not have provided feedback that was as in-depth as the data received from the survey. The participant population of this study allowed new and veteran educators who are invested in advanced degrees to be reached. The qualitative nature of the research, as well as the population, allowed for valued insight to an aspect of elementary education that affects students, teachers, and a school as a whole. Also, the small nature of this study allowed for a closer view of various perceived school issues as well as perceptions and expectations of school counselors from their elementary teacher colleagues. The survey design allowed for complete confidentiality that likely facilitated candid responses, even critical ones, to be heard. This potentially allowed for more accurate information to

be presented in the results of this research. This information can open the door for administrators, teachers, and counselors to gain insight on the issues that can arise from the undefined duties of a school counselor and how they coincide with the expectations and perceptions of school counselors held by various stakeholders.

Limitations of the study

The purposeful sample of participants could be seen as a potential limitation to this research. The participants were selected from one graduate program at a southeastern university. Therefore, a limited portrait of teachers’ perceptions and expectations was provided. Also, the limitation to only six survey responses, a low response rate, did not provide as many aspects of feedback as hoped for in the outset of this study, whereas twenty or more responses would have been preferred. Due to the small scale of this study, the results are not generalizable. Further one-on-one interviews or focus groups might have allowed for deeper responses.

Further research

Many directions need to be pursued subsequent to this research. First and foremost, research that focuses on a broader range of participants should be conducted. This research, as well as many studies from the past, has focused on one area, subgroup, or location. Also, research pertaining to the expectations of school counselors’ roles and duties as described by school counselors, teachers, and administrators should be considered. This approach will facilitate

comparisons between the three stakeholders. A more detailed description of the actual daily roles of the school counselor could be completed after reconciling differences of expectations between stakeholders. Research that categorizes the time counselors’ spend on each job duty would provide insight as to how great the need for more counselors is (in efforts to fulfill the demands made by students, teachers and administrators). Due to the increase in school testing and data tracking, a continued look at the pseudo-administrative roles often held by counselors and the effects this places on the other duties of counselors is needed.

Conclusion

Counseling has been a part of many schools since the late nineteenth century. Over time, the purpose of counseling, the roles of the school counselor, and the perceptions and expectations that various stakeholders have of the school counselor have undergone several changes. Teachers

are a defining aspect of the educational system, and therefore their expectations weigh heavily on the roles of the school counselor. Although the expectations and perceptions of teachers tend to vary by location, years of experience, and perceived needs of students, common themes do exist. The expectations and perceptions that teachers have of school counselors can help shape and define the actual roles and duties of school counselors. Teachers and counselors impact students in endless ways. With collaboration and consultation, and time afforded for both, these two defining parties can make a world of difference for many students.

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Appendix A Survey Questions

1. How many years experience do you have as a teacher?
2. What grade level/subject area(s) do you teach?
3. Briefly describe the demographic profile of your school. Please do not identify the school by name.
4. Does your school have a counselor/ guidance counselor? If so, how many?
5. Are you encouraged to work with the school counselor? If so, how?
6. In what ways, if any, has the school counselor worked with your students?
7. What assistance, if any, do you expect from a school counselor in regards to helping students gain academic achievement? In what ways has this been helpful or not to academic achievement?
8. Do you feel that it is within a counselor's duties to help students with behavior issues in the classroom? If so, how do you believe this should be achieved?
9. What is the primary contribution, if any, you feel that a school counselor provides for you as a teacher, the students, and the school as a whole?
10. What are the challenges and limitations, if any, of working with a school guidance counselor?

A commentary on the life of Eleanor Roosevelt through Erikson's eight stages of psychosocial development theory

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Introduction

Erik Erikson is known as a *neo-psychoanalyst*. Erikson follows in the Freudian tradition, though he breaks from Freud's obsession with sexual and deathly energies, and instead believes that social interactions provide context for the construct of personality.^{1, 2} According to Erikson, individuals move through eight stages of identity development. It is important to consider that Erikson did not limit the attitudes that comprise each crisis to a particular point in life.² For instance, an individual may still face some residual trust issues later in life even though this crisis becomes dominant in the post-natal period. Similarly, a newborn may show signs of autonomy even though he will not fully undergo this particular crisis for several months to come. Rather, Erikson states that the elements of each crisis are present in some form or another throughout life span development, but that each crisis rises to the centre of the stage at a particular point in time.² In this, Erikson argues that identity develops similarly to the way a child develops physically, with each element of potential development being present from birth. One then moves from one stage to another according to the level of maturity and how well mastery is achieved in the previous stage.²

These crises do not refer to disastrous life events, but rather signify a turning point and opportunity in an individual's life to further develop and mature as their perspective begin to radically change.² Each crisis has to be overcome before the individual can move on to the next stage, and the manner in which the individual resolves and interprets the crisis shapes his identity.^{2,3,4} When it comes to resolving a crisis, positive resolution can be achieved by striking a balance between the two attitudes present in each stage of crisis. For instance, leaning too much towards either attitude may cause *maladjusted tendencies*.⁴

Erikson was an admirer of autobiographies, which led him to apply his theory of development to several notable

figures. Erikson wrote that such works of literature may function as a "source [of] insight into the development of identity."² After the publication of his acclaimed books, *Childhood and Society* and *Identity: Youth and Crisis*, in which he elaborates on his theoretical perspective, Erikson went on to write *Young Man Luther* and *Gandhi's Truth*, in which he examines the lives of these extraordinary men through the lens of his theory of development. Following the trend established by Erikson, this paper is an attempt to study the life of Eleanor Roosevelt through the application of Erikson's eight stages of development.

Trust versus Mistrust

The first of Erikson's psychosocial developmental stages takes into account how well attended a child is by his caregivers, and thus the establishment of a system of trust or mistrust between child and parent.^{2,4} Erikson elaborates that the amount of trust developed depends not only on the provision of basic needs such as food and love, but more importantly on the quality of the relationship the child has with the mother.² Eleanor wrote in her autobiography that she believed her mother was more attached to her two brothers.⁵ During her childhood Eleanor was given the monikers of "granny", "old fashioned" and "ugly duckling" by her mother due to her shyness and lack of beauty, making her feel like a disgrace in the eyes of her mother.^{6,7} Her mother, Anna, used to introduce Eleanor by saying she was "plain at best."⁶ She grew up in a society where a lack of maternal care was common; her primary care taker was her French nurse, rather than her mother.⁶ Experiences such as these might have taught young Eleanor that she could not rely on her environment to meet her needs.

Autonomy versus Shame and Doubt

Erikson's second stage is termed *autonomy* versus *shame and doubt*. Here, toddlers learn how to assert their independence and begin to explore his or her surroundings.²

Eleanor likely lacked the proper

support and care needed to maneuver through this stage smoothly due to the lack encouragement and attention needed to build her own sense of worth.⁶ Eleanor wrote that as a child she had, "an inordinate desire for affection and praise, perhaps brought on by the fact I was conscious of my plain looks and lack of manners."⁸ She was separated from her family momentarily at the age of five, when she was sent to a convent during her mother's pregnancy so as to not disturb her.^{7,8} Eleanor's father, Elliot, was an object of worship for her, though he was not always a present, stable figure in her life.^{6,8} Eleanor's childhood writings speak of a young girl who showed signs of a developing sense of autonomy that was probably hindered by the fear of her father's disapproval and her mother's disfavor.⁸ For instance, Eleanor describes how she learned to suppress her tears at a very young age during an extremely weary trip because she knew it would be an annoyance to her father should she cry.⁸

Initiative versus Guilt

The third stage as described by Erikson is the *initiative* versus *guilt* stage. According to Erikson, at approximately four to five years of age, a sense of ambition and purpose to try new endeavors begins to emerge within a child.² However, this initiative behavior may be suppressed through the feeling of guilt derived from the fear of punishment or for being caught misbehaving.² Erikson proposes that this fear of disapproval develops into something similar to a conscience or an *inner voice* that inhibits the child's behavior.² The figures in Eleanor's early childhood appear rather strict with their expectations of she was to do and be, and as a child she was rarely allowed to grow in initiative behavior.^{7,9} Her grandmother was a demanding woman who had strong ideas on what a woman should and should not do, and disapproved of Eleanor doing anything out of the ordinary.^{7,9} Eleanor described her grandmother as someone who felt that she had failed her own children, and as such intended to raise her grandchildren with strict discipline and the "principle that 'no'

was easier to say than ‘yes.’”⁸

Industry versus Inferiority.

The state *industry* versus *inferiority* occurs when a child is between the ages of six and twelve. According to Erikson, a child at this stage seeks competence in the things they attempt, and tries to please others by fulfilling social expectations and roles he is placed in.² Similarly, he states that children at this stage begin to define themselves by what they can and cannot accomplish.² As such, Erikson identifies the inverse of industriousness as a feeling of helplessness or a lack of pride and enjoyment in doing something well.⁹ During this stage, peers, teachers, and the overall culture of the society play crucial roles in building the child’s self-esteem.^{2,3}

Eleanor began to have fears that she was unable to fulfill the expectations of others.^{8,9} and perhaps this made her feel inferior. Eleanor, in her autobiography, makes reference to the fact that she often disappointed her father with her timid nature, such as an incident in which she refused to ride a donkey down a hill because she was afraid of falling and getting hurt.⁸ Though the anxiety and fear that developed during the incident is natural for a child, the anxiety she probably felt from disappointing her father seems to have contributed to feelings of inferiority later in life. In her autobiography, she reminisces about how she still remembers her father’s disapproval over the aforementioned incident.⁸ Eleanor developed many different fears as a child, among which was her fear of being reprimanded and disliked by others.⁹

During this crucial developmental period, Eleanor’s father was admitted into a mental institution for his suicidal tendencies, alcoholism, and morphine addiction.⁷ Several months after that, she lost her mother and younger brother to diphtheria.⁷ Two years later, her father passed away as well.^{6,8} Losing them at a young age would almost certainly have a shattering effect on Eleanor’s development.

Identity versus Role Confusion

Erikson’s *identity* versus *role confusion* stage occurs during adolescence. Erikson proposes that during this stage, young adults try numerous roles so as to better understand how they may perceive themselves and how society may perceives them.² Erikson references faddish adolescent culture as an attempt among adolescents to experiment with different societal roles.² It is inferred from her biographies that Eleanor tried on several roles.^{5,7,10} She believed in her youth that someone would come and rescue her, and so she behaved with great decorum and correctness, exhibiting a “sweet and

thoughtful nature” towards others.¹⁰ When she was 15, Eleanor was sent to attend Allenswood in London, which was run by a headmistress dedicated to liberal causes.^{9,11} Her favorite classes were history and literature, taught by Headmistress Mlle Souvestre.⁶ There, she was exposed to political and social issues that she had been previously sheltered from.^{6,7}

Eleanor developed into the role of the ideal student; she was popular, received good grades, and was well loved and respected by her teachers.⁷ Her idea of herself and even her health began to improve under Mlle Souvestre’s care.⁶ Mlle Souvestre had opened Eleanor’s eyes to the world outside of her privilege class and helped her gain a sense of confidence.^{7,10} It is during this stage that Eleanor began exploring the role of being a philanthropist. She began working for social causes and making friends outside of her socio-economic class. Eleanor made her debut in New York society when she was 17, and soon became well known for volunteer work such as teaching children on the Lower East Side and joining the Junior League of the City of New York, much to the disapproval of her family.^{5,7}

Intimacy versus Isolation

Eleanor’s brief interest in humanitarian work does not fully explain her development from a timid girl to someone who would change the lives of many for the better. In fact, this humanitarian streak would be suppressed during her marriage to Franklin Delano Roosevelt. During this time, Eleanor had to go through the *intimacy* versus *isolation* stage of Erikson’s theory, before finally reaching a point of stability. This stage stresses the need for building healthy, committed and intimate relationships with others without losing one’s sense of self.^{2,3} Another element of this stage is the ability to accept another for who they are, with all their faults and differences.³

For the first ten years of her marriage, Eleanor’s sense of identity was submerged in her belief of what a dutiful mother and wife should be. Perhaps this overlap is due to Eleanor not having fully developed her sense of self at the time of her marriage; the tendency of making hasty life decisions before resolving the identity crisis is termed *premature foreclosure*.³ When she met Franklin, Eleanor was 18, and she married him at the age of 21. Eleanor was afraid of hurting or losing Franklin through confrontations with her mother-in-law, Sara, and so she spent those years acquiescing to the older woman in spite of her own reservations about the utility or value of her demands.^{5,11} For instance, Sara chose the home they would live in, appointed the servants and choose

the decorations.¹¹ Furthermore, the social reforms in which Eleanor participated were curbed by Sara. Eleanor was told that she might get infected with germs from working in the settlement home and pass them on to her children.^{7,10}

In the early years of her marriage, Eleanor felt that she was merely reflecting the taste and preferences of others.¹¹ Her sense of identity was based on her relationship with her husband and children. This relationship was jeopardized when Eleanor found love letters addressed to her secretary, Lucy, from Franklin. This betrayal caused a rift in her relationship with her husband, and strangely, strengthened her bond with her mother-in-law.⁷ The intimacy between Eleanor and Franklin never returned to what it was prior to the discovery of his affair.¹² The betrayal may have been the catalyst that pushed Eleanor to develop her own sense of self. Eleanor felt that she could no longer trust Franklin to such an extent or be as dependent on him as she had been before.⁷

Generativity versus Stagnation

The stage of *generativity* versus *stagnation* deals with striving to feel as though one has contributed and provided guidance to future generations.^{2,3} While as a young lady Eleanor had volunteered for charitable causes, this behavior was suppressed and didn’t reemerge until the events of World War I spurred her into action as a civil and social advocate.¹¹ In 1921, Franklin was diagnosed with polio. Eleanor nursed and supported Franklin following his illness. She continued her political activities as a way to motivate Franklin and to represent him in public.^{5,10,13} Her ability to accept his flaws and forgive his transgressions also demonstrates that she had progressed and graduated from the previous crisis of *intimacy vs. isolation*. She truly became his helpmate at this stage, even though they would never return to the same levels of physical intimacy.⁷

The numerous activities in which Eleanor participated illustrate how she chose to express the need for generativity. During this stage of her life, Eleanor participated in several charitable causes, including the Women’s Trade Union League and The Women’s Division of the New York Democratic Committee. She later established Van-Kill Industries, and taught at a private school for girls, Todhunter School.¹⁴ In 1932, Franklin D. Roosevelt became the 32nd President of the United States. Prior to and after the death of her husband, Eleanor continued to contribute to society by championing women’s rights, dealing with the squalid conditions of the coal town, Arthurdale, tackling poverty and unemployment among women and youths,

avidly supporting the Public Works Art Project, fighting for the rights of African-Americans, participating in the United Nations delegation that supported the rights of Soviet refugees, and planning the Declaration of Universal Human Rights.¹¹

Ego Integrity versus Despair

The final stage of Erikson's theory concerns how one views his or her accomplishments in life.² Someone who has accepted all the failures and who is proud of what they had accomplished achieves *ego integrity*, and conversely, someone filled with the bitterness of regret undergoes *despair*.² The ability to face the concept of death without fear is a key component of this stage.^{2,3} Up until the last days of her life, Eleanor Roosevelt did not lose her energy and drive to fight for her humanitarian causes.⁷ She taught for two years at Brandeis University and continued to write her daily column up until she was in her death bed.⁷ At the age of 78, Eleanor Roosevelt was diagnosed with bone marrow tuberculosis, which slowed her down considerably during the last two months of her life.⁷ According to biographers Burns and Dunn, she had pleaded with the doctors to let her die rather than to fruitlessly search for means to keep her alive.⁷ She finally passed away on November 7th, 1962. It is difficult to say if Eleanor truly felt either ego integrity or despair, though one might assume that towards the end of her life, she was proud of all her many accomplishments. In 1961 her memoirs were published. The fact that she could look back at the events of her life with all its ups and downs, and write of them in a positive manner speaks of her character and her acceptance of the life she had lived. She did not give up on living a full life and was quoted as saying "...I could not, at any age, be content to take my place in a corner by a fireside and simply look on."⁷

Conclusion

In summation, Erikson's paradigm's provides an interesting perspective into the psycho-history of Eleanor Roosevelt. Through the lens of his theory, one can evaluate the life history of great historical figures. In turn, such application provides an example and breaks down the many ways in which an individual can choose to navigate through life crises. Eleanor illustrates that having a tragically sad childhood or being betrayed does not doom a person to leading a tragically sad life. She presumably mistrusted her social environment, experienced shame and doubt in her early childhood, felt guilt as well as inferiority over her inability to obtain approval from her family, and struggled with her identity as a youth. It is unlikely that

any persons from her childhood could have predicted that the shy, timid child would grow up to become an important player on the world stage. More so, Eleanor reached the extremes of intimacy at the beginning of her marriage, and it seems she became too attached and dependent on Franklin to make her own decisions.

Yet the turning point of her life started when she moved away from her mother-in-law to Washington. This moment was when the developmental umbilical cord was finally cut, or when the psychological weaning took place. Sometime after they moved to Washington, Eleanor discovered the betrayal of her husband, and finally broke away from him to discover her own identity. From then on, one can see her drive and endless dedication to helping her fellow Americans and the world at large to ensure a better future for generations to come. Her life ended with her having accomplished numerous feats and having changed the image of what was expected of a First Lady, and indeed, a woman. For her contributions to the betterment in the treatment of people all around the world, especially the marginalized, she is given the accord, The First Lady of the World.

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