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EDITOR'S INTRODUCTION

The Wagner Forum for Undergraduate Research is an interdisciplinary journal which provides an arena where students can publish their research. Papers are reviewed with respect to their intellectual merit and scope of contribution to a given field. To enhance readability the journal is subdivided into three sections entitled *The Natural Sciences and Quantitative Analysis*, *The Social Sciences*, and *Critical Essays*. The first two of these sections are limited to papers and abstracts dealing with scientific inquiries, business research, clinical investigations and the use of mathematical/statistical modeling. The third section is reserved for speculative papers based on the scholarly review and critical examination of previous works.

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Section I: The Natural Sciences & Quantitative Analysis

The Antimicrobial Effects of Peppermint Oil, Cinnamon Oil, and Chamomile Oil on *Staphylococcus aureus* and *Escherichia coli*

Alexandra Ruth Elder (Microbiology)¹

The use of essential oils as antimicrobial agents have increased in popularity for reasons such as the rise in antibiotic resistant strains of pathogenic bacteria. The essential oils of interest in this research project were chamomile oil, cinnamon oil, and peppermint oil. All of which are known for their wide range of health benefits as well as their antimicrobial effects. The antimicrobial ability of these essential oils were tested on *Escherichia coli*, a known Gram-negative species, and *Staphylococcus aureus*, a known Gram-positive species. Three different techniques such as agar-well diffusion, agar dilution, and broth dilution, were used to determine the effectiveness of each oil at six different concentrations. The minimum lethal concentration and the minimum inhibitory concentration were established for each oil on each microbe. It was found that higher concentrations of oil were more effective at inhibiting growth of both species of bacteria than at lower concentrations across each method. It was also found that cinnamon oil had the greatest inhibitory effects on *E. coli* while chamomile had the least inhibitory effects. Furthermore, chamomile oil had the greatest inhibitory effects on *S. aureus*, while peppermint oil had the least inhibitory effects. The results also suggest that overall, Gram-negative species of bacteria are more resistant to the antimicrobial effects of essential oils than Gram-positive species.

I. Introduction

Essential Oils

Essential oils have been used for centuries as a natural way to treat human illness and disease. Essential oils are obtained through the distillation of plant materials such as leaves or bark and were first used in Egypt, India, and Persia (Guenther, 1947). In 1660, essential oils became widely used in mainstream medicine and grew in popularity (Buckle, 2014). It wasn't until the 1800s that scientists began to look at the chemical

¹ Research conducted under the supervision of Dr. Kathleen Bobbitt in partial fulfillment of the Senior Program requirements.

makeup of essential oils, and with this came the start of drug development. The naturally occurring active compounds found in plants are known as phytochemicals. Phytochemicals produced by plants play a role in plant growth and defense (Martinez *et al.*, 2017). These phytochemicals are also seen in essential oils and are attributed to their bioactive properties. One of the pioneers of the use of essential oils in medicine was Rene-Maurice Gattefore, who discovered aromatherapy in 1910. He used oils such as clove, chamomile, lavender, and lemon oil to treat the wounds of soldiers injured in World War I (Buckle, 2014). Gattefore used these oils to stop infections from progressing and accelerating the healing process.

Less than two decades later, Alexander Fleming discovered penicillin in 1928 (Buckle, 2014). This ground-breaking discovery paved the way for modern day drug therapy and at the same time temporarily put a hold on further research of essential oils. Today, however, the use of essential oils in the clinical setting are growing in popularity because of the increase in antibacterial resistance. Essential oils in recent years have also risen in interest because of negative consumer views of synthetic and artificial preservatives used across several industries in America (Chouhan *et al.*, 2017). It is also important to note that in people in developing countries throughout the world do not always have access to modern medicine and advances therefore, they rely heavily on traditional methods such as essential oils. It was noted by the World Health Organization that the majority of the world's population depends on traditional medicine for primary healthcare (Prabuseenivasan *et al.*, 2006). The ideology that essential oils can not only be used as a natural alternative to artificial preservatives but as an active member in the fight against antibiotic resistance is a main focal point in the research being conducted on them today.

Antibiotic Resistance

Antibiotic resistant pathogenic bacteria have made the treatment of bacterial infections difficult and in some cases, impossible. The overuse and misuse of antibiotics have created a global health crisis by causing a rise in antibiotic resistance. Antibiotic resistance is the ability of a microorganism to grow in the presences of antibiotics that would have once limited their growth or killed them (Tenover, 2006). Antibiotics have different mechanisms in which they kill bacteria such as interference of the cell wall, inhibition of protein synthesis, and inhibition of metabolic pathways (Tenover, 2006). Some species of bacteria are naturally resistant to certain types of antibiotics and can render them ineffective because they produce certain types of protein. However, some species become resistant to antibiotics because of a random mutation that occurs in their

DNA. These mutated genes increase the bacterial survival when in the presences of such antibiotic and thus are passed on to their progeny. Antibiotic resistance genes can be found on the bacterial chromosome or on a plasmid. A plasmid is a piece of self-replicating extrachromosomal DNA that can be transferred to competent bacterial cells via conjugation. Bacteria can also transfer genes from one another through a process called horizontal gene transfer (Hoek *et al.*, 2011). Bacteria have the ability to rapidly mutate and change to fit their environment due to their high growth rate.

One of the biggest concerns when it comes to antibiotic resistance is multidrug resistance strains of bacteria. Such bacteria have not only become resistance to a single antibiotic that would have once killed them, but they have become resistant to several types of antibiotics. While the degree of multidrug resistance can vary from a few antibiotics to many antibiotics, these microorganisms pose a major threat to society. This is because if a patient becomes infected with a multidrug resistant bacteria, such as Methicillin-resistant *Staphylococcus aureus*, health care providers have a difficult time treating the infection because it is resistant to several types of antibiotics commonly used to treat it. Species such as *Staphylococcus aureus*, *Enterococcus*, *Enterobacteriaceae*, *Pseudomonas aeruginosa*, and *Acinetobacter* are of main concern because of their prevalence in the hospital setting (Margiorakos *et al.*, 2011). The number of antibiotic resistant strains of bacteria are increasing, causing scientist to turn to alternative methods to treat bacterial infections. Essential oils prove to be a promising candidate in the fight against antibiotic resistance.

Staphylococcus aureus

Staphylococcus aureus is a round shaped, Gram-positive pathogenic bacteria that belongs to the *Staphylococcaceae* family. *Staphylococcus aureus* is found in the environment and is often part of human normal flora on the skin and mucosa membranes (Taylor and Unakal, 2019). *Staphylococcus aureus* is known to cause bacteremia, infective endocarditis, many skin and soft tissue infections (e.g., cellulitis, acne, boils, scolded skin syndrome, and others), pulmonary infections, urinary tract infections, toxic shock syndrome, gastroenteritis, meningitis, and osteomyelitis (Taylor and Unakal, 2019). Even though *S. aureus* is commonly seen as normal flora, it poses a major threat in the hospital setting and treatment is often difficult. *Staphylococcus aureus* infections have become difficult to treat because of multi-drug resistant strains such as Methicillin-Resistant *Staphylococcus aureus* (Taylor and Unakal, 2019). Typically, the drug of choice to treat *S. aureus* is penicillin or vancomycin (Taylor and Unakal, 2019).

However, many strains have become resistant to these drugs forcing health care providers to turn to alternative methods.

Escherichia coli

Escherichia coli is a Gram-negative bacillus that belongs to the *Enterobacteriaceae* family. *Escherichia coli* is found in the intestinal tract of animals and humans as part of their normal flora (Gossman *et al.*, 2019). *E. coli* is an important food and waterborne pathogen that causes diarrhea, dysentery, hemorrhagic colitis, and hemolytic-uremic syndrome in humans (Gossman *et al.*, 2019). Pathogenic strains of *E. coli* have several virulence factors that can cause severe illness in the host. One of the most virulent strains of *Escherichia coli* is *E. coli* 0157:H7, an enterohemorrhagic *E. coli* that uses a toxin that attacks small blood cells. This enterohemorrhagic *E. coli* kills the intestinal cells and causes diarrhea and severe abdominal cramps (Blount, 2015). Most patients recover from *E. coli* 0157:H7 infections without antibiotic treatment in a week to ten days, however antibiotics are given in persistent cases. Antibiotics may not be effective in all cases due to the rise in antibiotic resistant strains of enterohemorrhagic *E. coli* in countries such as the United States, United Kingdom, Iran, Singapore, and Brazil (Croxen *et al.*, 2013) The increase in these strains have led to the interest in essential oils to treat *E. coli* without antibiotic use.

Peppermint oil

Peppermint oil or, *Mentha piperita*, is part of the mint family along with spearmint, water mint, and forest mint and is obtained by steam distillation of the *Mentha piperita* plant leaves (Chumpitazi *et al.*, 2018). Peppermint oil has been used for centuries in countries like Greece, Egypt, and Rome as a natural stomach soother by decreasing the calcium influx in the smooth muscle cells (Chumpitazi *et al.*, 2018). The main phytochemicals of peppermint oil are menthol and menthone, two known antiviral, antibacterial, antifungal, and anti-inflammatory agents (Zaia *et al.*, 2016). Peppermint oil is also a common ingredient in household surface cleaners and is used to as a food preservative.

Cinnamon Oil

Cinnamon oil is obtained from the bark of the *Cinnamomum verum* plant. Cinnamon oil is commonly used in food flavoring, cosmetics, and in clinical settings. Cinnamon oil has been used to treat medical issues such as gingivitis, acne, gastrointestinal issues, and many others (Nabavi *et al.*, 2015). In addition, cinnamon oil

has been proven to have antibacterial, antifungal, and insecticidal properties (Nabavi *et al.*, 2015). The main components that are attributed to giving cinnamon oil its antibacterial properties are the bioactive phytochemicals cinnamaldehyde and eugenol, which have shown to prevent growth of both gram-negative and gram-positive species (Baker and Grant, 2017).

Chamomile Oil

Chamomile or, *Matricaria chamomilla*, is a member of the *Asteraceae* family. There are two main types of chamomile oil: German chamomile and Roman chamomile (Srivastava *et al.*, 2010). Chamomile oil has been used since ancient times and is known for its therapeutic properties and wide range of health benefits (Srivastava, Shankar, and Gupta, 2010). Chamomile oil has 120 chemical constituents that make it a versatile compound. Components such as *a*-bisabolol and cyclic ethers are known antimicrobial agents that are effective in killing both Gram-negative and Gram-positive bacteria (Srivastava *et al.*, 2010).

Objectives

The purpose of this research project was to observe the inhibitory effects of peppermint oil, cinnamon oil, and chamomile oil on a Gram-negative bacillus species, such as *Escherichia coli*, and a Gram-positive coccus species, such as *Staphylococcus aureus* using a number of biotechnical methods. *Staphylococcus aureus* and *Escherichia coli* are both pathogenic microbes that grow on selective and differential media such as mannitol salt agar, and eosin methylene blue agar respectively. Different concentrations of the oils were used in the agar-well diffusion, agar diffusion, and broth diffusion methods to determine their antimicrobial effectiveness. Minimum inhibitory concentrations as well as minimum lethal concentrations were determined for each oil for each microorganism.

II. Materials and Methods

Biological Material

The two organisms used in this experiment were *Escherichia coli* (PI336), which belongs in the *Enterobacteriaceae* family, and *Staphylococcus aureus* (PI4651), which belongs in the *Staphylococcaceae* family. *Escherichia coli*, is a Gram-negative bacillus species that appears as a pink rod shaped organism under a microscope when gram stained. *Escherichia coli* can be identified by its green metallic sheen on Eosin

Methylene Blue agar, as well being indole positive, methyl red positive, citrate negative, and Voges-Proskauer negative in an IMViC test. *Staphylococcus aureus* is a Gram-positive coccus species and will appear as round purple organisms under a microscope when gram stained. *S. aureus* can be identified by its ability to ferment mannitol on a mannitol salt agar, changing the color from red to yellow. *S. aureus* can also be identified by its positive catalase test and is hemolytic on blood agar.

Preparation of Water Blanks

The water blanks were made by adding 9 ml of distilled water to 100 empty test tubes using a sterile 10 mL pipette. The caps of the tubes were loosely placed on the tubes and the tubes were then autoclaved for 15 minutes using the liquid cycle to ensure they were sterile. These water blanks were used in the agar dilution method to make the different oil dilutions.

Preparation of Nutrient Broth

The nutrient broth tubes were made by adding 1000 mL of distilled water to a large Erlenmeyer flask using a graduated cylinder. Using a small scale, 25 grams of nutrient broth, purchased from Sigma-Aldrich Corporation, powder was measured on a weighing dish and was added to the 1000 mL of water. A stirring rod was added to the flask and the mixture was put on a hot plate until the powder was completely dissolved, this took about 10 minutes. Nine mL of nutrient broth was then added to 100 test tubes using a sterile 10 mL pipette. Caps were placed loosely on the tubes and were then autoclaved for 15 minutes using the liquid cycle to ensure they were sterile.

Preparation of Eosin Methylene Blue Agar

The Eosin Methylene Blue agar (Sigma-Aldrich Corporation), also called EMB agar, was made by first adding 1000 mL of distilled water to a larger Erlenmeyer flask using a graduated cylinder. Using a small scale, 37.5 grams of EMB powder was measured on a weighing dish and added to the 1000 mL of water. A stirring rod was then added to the flask and the mixture was put on a hot plate and brought to a boil. The top of the flask was then covered with aluminum foil and was autoclaved for 15 minutes on the liquid cycle. Once autoclaved the flask was then placed under the laminar flow hood to cool slightly. An even amount of agar was then added to 100 sterile petri dishes. The petri dishes were left to solidify and stored in the fridge until use.

Preparation of Mannitol Salt Agar

The Mannitol Salt Agar (Sigma-Aldrich Corporation), also called MSA, was made by adding 1000 mL of distilled water to a larger Erlenmeyer flask using a graduated cylinder. 111 grams of MSA powder was then weighted out on a small scale and added to the flask along with a stirring rod. The mixture was then placed on a hot plate and was brought to a boil for 1 minute. The flask was covered with aluminum foil and placed in the autoclave for 15 minutes on the liquid cycle. The flask was then placed under the laminar flow hood to cool slightly. An even amount of agar was then added to 100 petri dishes. The petri dishes were left to solidify and were stored in the fridge until use.

Agar-well Diffusion

The MSA and the EMB agar were both used for the agar-well diffusion test on their corresponding microbe. First, six different 50 μ l oil dilutions were made using the three oils, 1 μ l, 2 μ l, 4 μ l, 8 μ l, 16 μ l, and 32 μ l of peppermint, chamomile, and cinnamon oil were used in this experiment. The plates were divided into two equal halves using a marker and labeled following the different oil concentrations (*i.e.* each plate contained two different oil concentrations). An aliquot of 0.1 mL of each microbe was added to its corresponding plate using a sterile 1 mL pipette. The spread plate technique was used to spread the microbe evenly throughout the plate. The end of a sterile 10 mL pipette was used to make a small well in each half of the agar. Each well was then filled with 50 μ l of each oil concentration. One plate served as the control that contained water, which served as the positive control, and alcohol, which served as the negative control, in the two wells. The next plate contained 1 μ l/ 2 μ l in each well, the next plate contained 4 μ l/ 8 μ l, and the last plate contained 16 μ l/ 32 μ l. The plates were then incubated at 37 °C for 24 hours. After incubation, the zone of inhibition produced by each oil was measured using a ruler in centimeters. This procedure was repeated in triplicate for each microbe.

Agar Dilution

Six ten-fold dilutions of each oil were made using water blanks. One mL of each ten-fold dilution was added to sterile petri dishes. MSA and EMB agar were made using the procedure described in the previous sections. Nine mL of each test agar was then added to each plate using a sterile 10 mL pipette. The plates were then gently stirred to allow the oil and agar to mix. The plates were left to solidify for 24 hours. 0.1 ml of each microbe was added to each plate and was spread evenly using a sterile inoculating loop. The plates were incubated at 37 °C for 24 hours and the CFU of each plate was

determined by counting the number of colonies presence. Any colony count under 30 CFU was considered statistically insignificant. Any count above 300 CFU was determined to be too numerous to count and were recorded as TNC. This procedure was repeated in triplicate for each microbe.

Broth Dilution

The broth dilution method was performed using nutrient broth. Six ten-fold dilutions were made of each oil using the nutrient broth. One mL of each microbe was added to each dilution, as well as a water blank that served as a negative control, and brain heart infusion broth, or BHI, that served as the positive control. The tubes were incubated at 37 °C for 24 hours. After incubation, subculture inoculations were taken and plated onto the test agars, MSA and EMB. The minimum inhibitory concentration, or MIC, and minimum lethal concentration, or MLC, were determined by no growth after the 24-hour incubation period and on the subculture inoculation plates. This procedure was repeated in triplicate for each microbe in each oil dilution.

III. Results

Agar-well Diffusion

Results for agar-well diffusion test on *Escherichia coli*

The results of the agar-well diffusion test are below in tables 1-6. The zone of inhibition around each well was measured in centimeters (cm) using a small ruler. The mean and standard deviation of each concentration in all three trails are also shown. Tables 1,2, and 3 show the results using *Escherichia coli*. Table 1 shows the zone of inhibition around each well containing different concentrations of chamomile oil. The zone of inhibition produced by chamomile oil was 0 cm across all trails. Table 2 shows that cinnamon oil at concentrations 8 µl,16 µl, and 32 µl will create a zone of inhibition. Table 3 shows that peppermint oil at 16 µl and 32 µl concentrations will create a zone of inhibition. In any of the trials, concentrations of 1 µl, 2 µl, and 4 µl did not produce a zone of inhibition.

Table 1: The zone of inhibition created by chamomile oil on *Escherichia coli* on EMB agar using the agar-well diffusion method.

| Oil Concentration | Trail 1 (cm) | Trail 2 (cm) | Trail 3 (cm) | Average (cm) | Standard Deviation |
|--------------------------|---------------------|---------------------|---------------------|---------------------|---------------------------|
| 1 μ l | 0 cm | 0 cm | 0 cm | 0 cm | 0 |
| 2 μ l | 0 cm | 0 cm | 0 cm | 0 cm | 0 |
| 4 μ l | 0 cm | 0 cm | 0 cm | 0 cm | 0 |
| 8 μ l | 0 cm | 0 cm | 0 cm | 0 cm | 0 |
| 16 μ l | 0 cm | 0 cm | 0 cm | 0 cm | 0 |
| 32 μ l | 0 cm | 0 cm | 0 cm | 0 cm | 0 |
| Water | 0 cm | 0 cm | 0 cm | 0 cm | 0 |
| Alcohol | No Growth | No Growth | No Growth | No Growth | 0 |

Table 2: The zone of inhibition created by cinnamon oil on *Escherichia coli* on EMB agar using the agar-well diffusion method

| Oil Concentration | Trail 1 (cm) | Trail 2 (cm) | Trail 3 (cm) | Average (cm) | Standard Deviation |
|--------------------------|---------------------|---------------------|---------------------|---------------------|---------------------------|
| 1 μ l | 0 cm | 0 cm | 0 cm | 0 cm | 0 |
| 2 μ l | 0 cm | 0 cm | 0 cm | 0 cm | 0 |
| 4 μ l | 0 cm | 0 cm | 0 cm | 0 cm | 0 |
| 8 μ l | 0 cm | 1 cm | 0 cm | .333 cm | 0.577 |
| 16 μ l | 1.1 cm | 1.4 cm | 0 cm | .833 cm | 0.737 |
| 32 μ l | 1.9 cm | 1.7 cm | 2.1 cm | 1.9 cm | 0.2 |
| Water | 0 cm | 0 cm | 0 cm | 0 cm | 0 |
| Alcohol | No Growth | No Growth | No Growth | No Growth | 0 |

Table 3: The zone of inhibition created by peppermint oil on *Escherichia coli* on EMB agar using the agar-well diffusion method

| Oil Concentration | Trail 1 (cm) | Trail 2 (cm) | Trail 3 (cm) | Average (cm) | Standard Deviation |
|--------------------------|---------------------|---------------------|---------------------|---------------------|---------------------------|
| 1 μ l | 0 cm | 0 cm | 0 cm | 0 cm | 0 |
| 2 μ l | 0 cm | 0 cm | 0 cm | 0 cm | 0 |
| 4 μ l | 0 cm | 0 cm | 0 cm | 0 cm | 0 |
| 8 μ l | 0 cm | 0 cm | 0 cm | 0 cm | 0 |
| 16 μ l | 0 cm | 1 cm | 1.4 cm | 0.8 cm | 0.721 |
| 32 μ l | 1.5 cm | 2.6 cm | 0 cm | 1.36 cm | 1.305 |
| Water | 0 cm | 0 cm | 0 cm | 0 cm | 0 |
| Alcohol | No Growth | No Growth | No Growth | No Growth | 0 |

Results for agar-well diffusion test on *Staphylococcus aureus*

Tables 4, 5, and 6 below show the diameter in centimeters of the zone of inhibition around each well using *Staphylococcus aureus*. Chamomile at concentrations of 4 μ l, 8 μ l, 16 μ l, and 32 μ l produced a zone of inhibition on *S. aureus* in all trials and did not at concentrations 1 μ l and 2 μ l as seen in Table 4. Cinnamon oil produced a zone of inhibition at concentrations of 16 μ l and 32 μ l and did not at 1 μ l, 2 μ l, 4 μ l, and 8 μ l as seen in Table 5. Peppermint oil produced a zone of inhibition on *S. aureus* at concentrations of 16 μ l and 32 μ l and no growth was seen on the plate. This oil was unable to inhibit growth at concentrations 1 μ l, 2 μ l, 4 μ l, and 8 μ l.

Table 4: The zone of inhibition created by chamomile oil on *Staphylococcus aureus* on MSA using agar-well diffusion method

| Oil Concentration | Trail 1 (cm) | Trail 2 (cm) | Trail 3 (cm) | Average (cm) | Standard Deviation |
|--------------------------|---------------------|---------------------|---------------------|---------------------|---------------------------|
| 1 µl | 0 cm | 0 cm | 0 cm | 0 cm | 0 |
| 2 µl | 0 cm | 0 cm | 0 cm | 0 cm | 0 |
| 4 µl | 0 cm | 2.2 cm | 2.7 | 1.63 cm | 1.43 |
| 8 µl | 0 cm | 2.5 cm | 1.5 | 1.3 cm | 1.25 |
| 16 µl | 3.8 cm | 3.8 cm | 3.8 cm | 3.8 cm | 5.43 |
| 32 µl | 3.8 cm | 3.8 cm | 3.8 cm | 3.8 cm | 5.43 |
| Water | 0 cm | 0 cm | 0 cm | 0 cm | 0 |
| Alcohol | No Growth | No Growth | No Growth | No Growth | 0 |

Table 5: The zone of inhibition created by cinnamon oil at different concentrations on *Staphylococcus aureus* using the agar-well diffusion method.

| Oil Concentration | Trail 1 (cm) | Trail 2 (cm) | Trail 3 (cm) | Average (cm) | Standard Deviation |
|--------------------------|---------------------|---------------------|---------------------|---------------------|---------------------------|
| 1 µl | 0 cm | 0 cm | 0 cm | 0 cm | 0 |
| 2 µl | 0 cm | 0 cm | 0 cm | 0 cm | 0 |
| 4 µl | 0 cm | 0 cm | 0 cm | 0 cm | 0 |
| 8 µl | 0 cm | 0 cm | 0 cm | 0 cm | 0 |
| 16 µl | 0 cm | 1.7 cm | 2.7 cm | 1.46 cm | 1.36 |
| 32 µl | 2.4 cm | 3.3 cm | 3 cm | 2.9 cm | 0.45 |
| Water | 0 cm | 0 cm | 0 cm | 0 cm | 0 |
| Alcohol | No Growth | No Growth | No Growth | No Growth | 0 |

Table 6: The zone of inhibition created by peppermint oil at different concentrations on *Staphylococcus aureus* using the agar-well diffusion method.

| Oil Concentration | Trail 1 (cm) | Trail 2 (cm) | Trail 3 (cm) | Average (cm) | Standard Deviation |
|--------------------------|---------------------|---------------------|---------------------|---------------------|---------------------------|
| 1 µl | 0 cm | 0 cm | 0 cm | 0 cm | 0 |
| 2 µl | 0 cm | 0 cm | 0 cm | 0 cm | 0 |
| 4 µl | 0 cm | 0 cm | 0 cm | 0 cm | 0 |
| 8 µl | 0 cm | 0 cm | 0 cm | 0 cm | 0 |
| 16 µl | 3.8 cm | 3.8 cm | 3.8 cm | 3.8 cm | 5.43 |
| 32 µl | 3.8 cm | 3.8 cm | 3.8 cm | 3.8 cm | 5.43 |
| Water | 0 cm | 0 cm | 0 cm | 0 cm | 0 |
| Alcohol | No Growth | No Growth | No Growth | No Growth | 0 |

Broth Dilution

Results of the Broth Dilution test on *Escherichia coli*

The results of the broth dilution test are recorded in tables 7-12. The effectiveness of each oil was determined by the presences or absences of growth in each broth dilution tube as well as the subculture inoculations. Brain heart infusion broth, or BHI, was used as a positive control, and water was used as a negative control. In every trial, there was growth in every BHI tube, and no growth in every water tube. Table 7 shows that cinnamon oil inhibited the growth of *E. coli* at 10^{-3} concentration. Chamomile oil did not have any effect on *E. coli* at all concentrations except for in trial 3 where it inhibited grow at the highest concentration as seen in Table 8. Peppermint oil did not have any effect on *E. coli* at all concentrations across all three trials.

Table 7: The growth and subculture inoculation count of *Escherichia coli* in different concentrations of cinnamon oil using the broth dilution method.

| Oil Dilution | Trial 1 | Subculture inoculation | Trial 2 | Subculture inoculation | Trial 3 | Subculture inoculation |
|--------------------------|----------------|-------------------------------|----------------|-------------------------------|----------------|-------------------------------|
| 10 ⁻¹ | Growth | TNC | Growth | TNC | Growth | TNC |
| 10 ⁻² | Growth | TNC | Growth | TNC | Growth | TNC |
| 10 ⁻³ | No Growth | 6 CFU | No Growth | No Growth | No Growth | No Growth |
| 10 ⁻⁴ | Growth | TNC | Growth | TNC | Growth | TNC |
| 10 ⁻⁵ | Growth | TNC | Growth | TNC | Growth | TNC |
| 10 ⁻⁶ | Growth | TNC | Growth | TNC | Growth | TNC |
| BHI (positive control) | Growth | TNC | Growth | TNC | Growth | TNC |
| Water (negative control) | No Growth | No Growth | No Growth | No Growth | No Growth | No Growth |

Table 8: The growth and subculture inoculation count of *Escherichia coli* in different concentrations of chamomile oil using the broth dilution method.

| Oil Dilution | Trial 1 | Subculture Inoculation | Trial 2 | Subculture inoculation | Trial 3 | Subculture inoculation |
|--------------------------|----------------|-------------------------------|----------------|-------------------------------|----------------|-------------------------------|
| 10 ⁻¹ | Growth | TNC | Growth | TNC | No Growth | TNC |
| 10 ⁻² | Growth | TNC | Growth | TNC | Growth | TNC |
| 10 ⁻³ | Growth | TNC | Growth | TNC | Growth | TNC |
| 10 ⁻⁴ | Growth | TNC | Growth | TNC | Growth | TNC |
| 10 ⁻⁵ | Growth | TNC | Growth | TNC | Growth | TNC |
| 10 ⁻⁶ | Growth | TNC | Growth | TNC | Growth | TNC |
| BHI (positive control) | Growth | TNC | Growth | TNC | Growth | TNC |
| Water (negative control) | No Growth | No Growth | No Growth | No Growth | No Growth | No Growth |

Table 9: The growth and subculture inoculation count of *Escherichia coli* in different concentrations of peppermint oil using the broth dilution method.

| Oil Dilution | Trail 1 | Subculture inoculation | Trail 2 | Subculture inoculation | Trail 3 | Subculture inoculation |
|--------------------------|-----------|------------------------|-----------|------------------------|-----------|------------------------|
| 10 ⁻¹ | Growth | TNC | Growth | TNC | Growth | TNC |
| 10 ⁻² | Growth | TNC | Growth | TNC | Growth | TNC |
| 10 ⁻³ | Growth | TNC | Growth | TNC | Growth | TNC |
| 10 ⁻⁴ | Growth | TNC | Growth | TNC | Growth | TNC |
| 10 ⁻⁵ | Growth | TNC | Growth | TNC | Growth | TNC |
| 10 ⁻⁶ | Growth | TNC | Growth | TNC | Growth | TNC |
| BHI (positive control) | Growth | TNC | Growth | TNC | Growth | TNC |
| Water (negative control) | No Growth | No Growth | No Growth | No Growth | No Growth | No Growth |

Results of the Broth Dilution test on *Staphylococcus aureus*

Tables 10, 11, and 12 show the effects of the different oil concentrations on the growth of *Staphylococcus aureus*. Chamomile oil inhibited the growth of *S. aureus* at concentrations 10⁻¹, 10⁻², 10⁻³, 10⁻⁴ in all trails as seen in Table 10. Cinnamon oil inhibited the growth of *S. aureus* at 10⁻³ concentration in all trails as seen in Table 11. Peppermint oil inhibited the growth of *S. aureus* at concentrations 10⁻¹, 10⁻², 10⁻³, and 10⁻⁴ as seen in Table 12.

Table 10: The growth and subculture inoculation count of *Staphylococcus aureus* in different concentrations of chamomile oil using the broth dilution method.

| Oil Dilution | Trail 1 | Subculture inoculation | Trail 2 | Subculture inoculation | Trail 3 | Subculture inoculation |
|-----------------------------|----------------|-------------------------------|----------------|-------------------------------|----------------|-------------------------------|
| 10 ⁻¹ | No Growth | No Growth | No Growth | No Growth | No Growth | No Growth |
| 10 ⁻² | No Growth | No Growth | No Growth | No Growth | No Growth | No Growth |
| 10 ⁻³ | No Growth | No Growth | No Growth | No Growth | No Growth | 8 CFU |
| 10 ⁻⁴ | No Growth | No Growth | No Growth | No Growth | No Growth | No Growth |
| 10 ⁻⁵ | No Growth | No Growth | Growth | TNC | Growth | TNC |
| 10 ⁻⁶ | Growth | TNC | Growth | TNC | Growth | TNC |
| BHI (positive control) | Growth | TNC | Growth | TNC | Growth | TNC |
| Water (negative control) | No Growth | TNC | No Growth | TNC | No Growth | TNC |

Table 11: The growth and subculture inoculation count of *Staphylococcus aureus* in different concentrations of cinnamon oil using the broth dilution method.

| Oil Dilution | Trial 1 | Subculture inoculation | Trial 2 | Subculture inoculation | Trial 3 | Subculture inoculation |
|--------------------------|----------------|-------------------------------|----------------|-------------------------------|----------------|-------------------------------|
| 10 ⁻¹ | Growth | TNC | Growth | TNC | Growth | TNC |
| 10 ⁻² | Growth | TNC | Growth | TNC | Growth | TNC |
| 10 ⁻³ | No Growth | No Growth | No Growth | No Growth | No Growth | No Growth |
| 10 ⁻⁴ | No Growth | 18 CFU | Growth | TNC | Growth | TNC |
| 10 ⁻⁵ | No Growth | No Growth | Growth | TNC | Growth | TNC |
| 10 ⁻⁶ | No Growth | TNC | Growth | TNC | Growth | TNC |
| BHI (positive control) | Growth | TNC | Growth | TNC | Growth | TNC |
| Water (negative control) | No Growth | No Growth | No Growth | No Growth | No Growth | No Growth |

Table 12: The growth and subculture inoculation count of *Staphylococcus aureus* in different concentrations of peppermint oil using the broth dilution method.

| Oil Dilution | Trial 1 | Subculture inoculation | Trial 2 | Subculture inoculation | Trial 3 | Subculture inoculation |
|--------------------------|-----------|------------------------|-----------|------------------------|-----------|------------------------|
| 10 ⁻¹ | No Growth | No Growth | Growth | TNC | No Growth | No Growth |
| 10 ⁻² | No Growth | No Growth | No Growth | 14 CFU | No Growth | No Growth |
| 10 ⁻³ | No Growth | No Growth | Growth | TNC | No Growth | No Growth |
| 10 ⁻⁴ | No Growth | No Growth | No Growth | No Growth | No Growth | 28 CFU |
| 10 ⁻⁵ | Growth | TNC | Growth | TNC | No Growth | No Growth |
| 10 ⁻⁶ | Growth | TNC | Growth | TNC | Growth | TNC |
| BHI (positive control) | Growth | TNC | Growth | TNC | Growth | TNC |
| Water (negative control) | No Growth | No Growth | No Growth | No Growth | No Growth | No Growth |

Minimum Inhibitory Concentration and Minimum Lethal Concentration

The minimum inhibitory concentration, or MIC, and the minimum lethal concentration, or MLC, were established for each oil on both bacterial species. The MIC and MLC were determined using the broth tubes and the subculture inoculation plates. The lowest oil concentration that did not show turbidity, or cloudiness, in the broth tubes and showed no growth on the subculture inoculations was considered the MIC. The MIC of cinnamon oil was 10⁻³ for both *E. coli* and *S. aureus*. The MIC of peppermint oil for *S. aureus* was 10⁻⁴ and no MIC was found for *E. coli* as growth was seen at all concentrations. The MIC of chamomile oil for *E. coli* was also not found because growth was also seen at all concentrations. The MIC of chamomile for *S. aureus* was determined to be 10⁻⁴. The MLC was established by the highest concentration of essential oil that did not show growth in both the broth tubes and the subculture inoculations. The MLC of

cinnamon oil for *E. coli* was 10^{-3} . The MLC for both chamomile oil and peppermint oil for *E. coli* were not established because growth as seen at all concentrations. The MLC of chamomile oil and peppermint oil for *S. aureus* were both 10^{-1} . The MLC of cinnamon oil was 10^{-3} .

Table 13: The MIC and MLC of chamomile oil, peppermint oil, and cinnamon oil for *Escherichia coli*.

| Essential oil | MIC | MLC |
|----------------|-----------|-----------|
| Chamomile oil | N/A | N/A |
| Cinnamon oil | 10^{-3} | 10^{-3} |
| Peppermint oil | N/A | N/A |

Table 14: The MIC and MLC of chamomile oil, peppermint oil, and cinnamon oil for *Staphylococcus aureus*.

| Essential oil | MIC | MLC |
|----------------|-----------|-----------|
| Chamomile oil | 10^{-4} | 10^{-1} |
| Cinnamon oil | 10^{-3} | 10^{-3} |
| Peppermint oil | 10^{-4} | 10^{-4} |

Agar Dilution

Results of the Agar Dilution test on *Escherichia coli*

The results of the agar dilution test are recorded in tables 15-20. The number of colonies on each dilution plate was counted to determine the effectiveness of each oil at different concentrations. A plate containing no oil served as the control in which growth was seen in each trial. Tables 15, 16, and 17 show the number of colonies of *Escherichia coli* present at each oil concentration. Chamomile oil inhibited the growth of *E. coli* at 10^{-3} and 10^{-4} in two of the three trials. It also at inhibited growth across all trials at 10^{-6} as seen in Table 15. Cinnamon oil at the highest concentration inhibited the growth of *E. coli* across all trails as seen in Table 14. It was unable to inhibit growth at all other concentrations in two of the three trials. Peppermint oil showed to inhibit growth at 10^{-1}

and 10^{-6} concentrations. It did not inhibit growth at all other concentrations in two of the three trials as seen in Table 17.

Table 15: The number of colonies of *Escherichia coli* in different concentrations of chamomile oil using the agar dilution method.

| Oil Dilution | Trial 1 | Trial 2 | Trial 3 |
|---------------------|----------------|----------------|----------------|
| 10^{-1} | No Growth | TNC | TNC |
| 10^{-2} | No Growth | TNC | TNC |
| 10^{-3} | No Growth | No Growth | TNC |
| 10^{-4} | No Growth | No Growth | TNC |
| 10^{-5} | TNC | TNC | TNC |
| 10^{-6} | No Growth | No Growth | No Growth |
| No oil (control) | TNC | TNC | TNC |

Table 16: The number of colonies of *Escherichia coli* in different concentration of cinnamon oil using the agar dilution method.

| Oil Dilution | Trial 1 | Trial 2 | Trial 3 |
|---------------------|----------------|----------------|----------------|
| 10^{-1} | No Growth | No Growth | No Growth |
| 10^{-2} | No Growth | TNC | TNC |
| 10^{-3} | No Growth | TNC | TNC |
| 10^{-4} | TNC | TNC | TNC |
| 10^{-5} | TNC | TNC | TNC |
| 10^{-6} | TNC | TNC | TNC |
| No oil(control) | TNC | TNC | TNC |

Table 17: The number of colonies of *Escherichia coli* in different concentrations of peppermint using the agar dilution method.

| Oil Dilution | Trial 1 | Trial 2 | Trial 3 |
|------------------|-----------|-----------|-----------|
| 10 ⁻¹ | No Growth | No Growth | No Growth |
| 10 ⁻² | No Growth | TNC | TNC |
| 10 ⁻³ | TNC | TNC | TNC |
| 10 ⁻⁴ | TNC | TNC | TNC |
| 10 ⁻⁵ | TNC | TNC | TNC |
| 10 ⁻⁶ | No Growth | No Growth | No Growth |
| No oil(control) | TNC | TNC | TNC |

Results of the Agar Dilution test on *Staphylococcus aureus*

The tables below show the number of colonies of *Staphylococcus aureus* on MSA agar with different oil concentrations of cinnamon oil, chamomile oil, and peppermint oil. Chamomile oil inhibited the growth of *S. aureus* at concentrations of 10⁻¹ and 10⁻² as shown in Table 18. Cinnamon oil inhibited the growth at concentration of 10⁻¹, 10⁻², and 10⁻³. The plates containing peppermint oil show growth at all concentrations as seen in Table 20.

Table 18: The number of colonies of *Staphylococcus aureus* in different concentrations of chamomile oil using the agar dilution method.

| Oil Dilution | Trial 1 | Trial 2 | Trial 3 |
|------------------|-----------|-----------|---------|
| 10 ⁻¹ | No Growth | No Growth | TNC |
| 10 ⁻² | TNC | No Growth | TNC |
| 10 ⁻³ | TNC | TNC | TNC |
| 10 ⁻⁴ | TNC | TNC | TNC |
| 10 ⁻⁵ | TNC | TNC | TNC |
| 10 ⁻⁶ | TNC | TNC | TNC |
| No oil(control) | TNC | TNC | TNC |

Table 19: The number of colonies of *Staphylococcus aureus* in different concentrations of cinnamon oil using the agar dilution method.

| Oil Dilution | Trial 1 | Trial 2 | Trial 3 |
|------------------|-----------|-----------|-----------|
| 10 ⁻¹ | No Growth | No Growth | No Growth |
| 10 ⁻² | No Growth | No Growth | No Growth |
| 10 ⁻³ | No Growth | No Growth | No Growth |
| 10 ⁻⁴ | TNC | TNC | TNC |
| 10 ⁻⁵ | TNC | TNC | TNC |
| 10 ⁻⁶ | TNC | TNC | TNC |
| No oil(control) | TNC | TNC | TNC |

Table 20: The number of colonies of *Staphylococcus aureus* in different concentrations of peppermint oil using the agar dilution method.

| Oil Dilution | Trial 1 | Trial 2 | Trial 3 |
|------------------|---------|---------|---------|
| 10 ⁻¹ | TNC | TNC | TNC |
| 10 ⁻² | TNC | TNC | TNC |
| 10 ⁻³ | TNC | TNC | TNC |
| 10 ⁻⁴ | TNC | TNC | TNC |
| 10 ⁻⁵ | TNC | TNC | TNC |
| 10 ⁻⁶ | TNC | TNC | TNC |
| No oil(control) | TNC | TNC | TNC |

IV. Discussion

The results obtained during this research showed that chamomile oil, cinnamon oil, and peppermint oil had inhibitory effects on both a Gram-positive species *Staphylococcus aureus*, and a Gram-negative species *Escherichia coli*. In all three of the

methods performed, it was shown that each of the oils were more effective at inhibiting the growth of both species of bacteria at a higher concentration than at a lower concentration overall. However, each oil had its own effect on each of the bacteria. In some oils, a higher concentration permitted growth while some lower concentration inhibited it. In other oils, an intermediate oil concentration inhibited growth while all others did not. Both cases will be discussed in greater detail below. Overall, chamomile oil had the lowest inhibiting ability on *E. coli*, while cinnamon oil had the greatest inhibitory effects. Using *S. aureus*, chamomile had the greatest inhibitory effects while peppermint oil was observed to have the lowest inhibitory effects. It was also shown that overall, *E. coli*, a Gram-negative species, was less susceptible to the antimicrobial effects of the essentials as compared to *S. aureus*, a Gram-positive species.

Phytochemicals and Antimicrobial Activity

Phytochemicals are known as the chemicals that are naturally produced by plants. All essential oils are derived from plants via distillation of plant leaves, bark, or other plant material. Plants produce these phytochemicals to protect themselves however, many phytochemicals have been found to protect humans against diseases as well. The phytochemicals produced by a plant can vary despite being the same species. This is because of several factors such as harvest time, where the plant was grown, and environmental factors. This variation can alter the antimicrobial effectiveness of an essential oil. Cinnamaldehyde and eugenol, two phytochemicals of cinnamon oil are two known antimicrobial agents. A study conducted by the Department of Biotechnology at Alagappa University showed that eugenol increased the permeability of the membrane of *Salmonella typhi*, a Gram-negative species. Cinnamaldehyde has also shown to act as a membrane irritant by Nabavi et al. In chamomile oil, phytochemicals such as β -farnesene and *a*-bisabolol have been identified as antimicrobial agents. A study conducted by De Lucca et al., showed that *a*-bisabolol was able to inhibit growth of *S. aureus* and *Pseudomonas aeruginosa*. Peppermint oil is known to contain the phytochemicals menthol and menthone. According to a study conducted by Reddy et al., these two phytochemicals have antimicrobial effects on both Gram-negative and Gram-positive species. The phytochemicals found in these oils are an important part of this experiment because they allow us to analyze and compare how each of them effects Gram-negative and Gram-positive species. The three oils effected the growth of *S. aureus* and *E. coli* differently. For example, chamomile oil had the greatest inhibitory effects on *S. aureus*,

while it had the least inhibitory effects on *E. coli*, which may be contributed to the antimicrobial activity of the phytochemicals found in these oils.

Nazzaro et al., suggests several mechanisms of actions in which essential oils can take against microbes. One of those mechanisms is that essential oils can affect both the external envelope of the cell as well as the cytoplasm which disrupts bacterial homeostasis. According to Nazzaro et al., essential oils are typically hydrophobic and that this characteristic is responsible for the disruption of bacterial cell membrane because of an increase of permeability of the cell membrane. The hydrophobicity of essential oils resembles the hydrophobicity of the cell membrane therefore, there is an inability to separate the essential oil from the bacterial membrane (Nazzaro et al., 2013). This disruption in the cell membrane leads to a disruption to the cells metabolic processes and overall homeostasis. According to Nazzaro et al., the hydrophobicity of essential oils to penetrate the cell wall and disrupt cell function could be a contributing factor as to why essential oils are generally more effective against Gram-positive bacteria as opposed to Gram-negative bacteria. This concept of how Gram-negative and Gram-positive bacteria are affected differently will be discussed in greater detail in a following subsection. Several other ways in which essential oils can affect bacterial growth is that they can affect the fatty acid profile of the cell membrane, proteins, ATP and ATPases, and cell morphology (Nazzaro et al., 2013)

Agar Dilution

The agar dilution test was used to determine the effectiveness of each oil at six different dilutions by counting the number of colonies on each plate after a 24-hour incubation period. Mannitol salt agar and eosin methylene blue agar were the test media of choice for all experiments in this project because they are both selective and differential. *Staphylococcus aureus* changes the color of MSA from red to yellow due to its ability to ferment mannitol, while *E. coli* produces colonies with a green metallic sheen on EMB agar. These two agars made it easy to count the number of colonies present on each plate as well as ensure that no other species of bacteria were present. A plate with no oil was used in each trial as a control to compare to each dilution plate. Growth was expected on these plates because there was nothing present to inhibit bacterial growth. The effectiveness of each oil was determined by the number of colonies present on each plate. A colony forming unit, or CFU, was used to determine the number of viable cells in a given sample. Any number less than 30 CFU is considered insignificant, and any number greater than 300 CFU is considered too numerous to count,

or TNC. The fewer the colonies on the plate meant the oil used had a greater inhibiting activity. Overall, higher concentrations of oil produced plates with fewer or no colonies.

Escherichia coli was inhibited at some concentration by each of the three oils using this method. Chamomile oil had the highest inhibitory effects followed by peppermint oil, and cinnamon oil had the least effect. While using this method, two of the oils, peppermint and chamomile, allowed growth a higher concentration but, inhibited growth at lower concentrations. Chamomile oil inhibited the growth of *E. coli* at concentrations 10^{-3} , 10^{-4} , and 10^{-6} , and allowed growth at concentrations 10^{-1} , 10^{-2} , and 10^{-5} as shown in Table 13. Peppermint oil inhibited growth at concentration 10^{-1} and 10^{-6} and allowed growth at all concentrations in between as seen in (Table 17). A possible explanation for this is that at high concentration these oils promote growth while at lower concentrations they can inhibit it. Another possible explanation for this could be experimental error or design. Experimental error or design is more likely the cause since this occurrence was not typically supported by other research.

Staphylococcus aureus was inhibited at some concentration by two of the three essential oils, chamomile oil and cinnamon oil. Peppermint oil was unable to inhibit the growth of *S. aureus* at any concentration. These findings are not supported by the data collected in the other two methods in which peppermint oil was effective at inhibiting growth of *S. aureus* at several concentrations. A causative factor of this could have been because towards the end of this research project, the peppermint oil used in the previous methods had run out. Peppermint oil capsules had been used in its place which could have caused this inconsistency in results. Cinnamon oil had the highest inhibitory effects as it was able to inhibit grow at concentrations 10^{-1} , 10^{-2} , and 10^{-3} , while chamomile oil was only able to inhibit grow at 10^{-1} concentration in two of the three trails. Using this method, *S. aureus* was more resistant to the essential oils as compared to *E. coli*. However, this was not seen in the other two methods in which *E. coli* proved to be more resistant than *S. aureus*.

Agar-well Diffusion

The agar-well diffusion test was used to determine the susceptibility of *S. aureus* and *E. coli* to each oil at different concentrations by measuring the zone of inhibition around each well. In this experiment, a well with water served as a control in which a zone of 0 cm was observed. This was expected because water has no known antimicrobial components allowing the bacteria to grow. A well with alcohol served as a negative control as it inhibited bacterial growth in all trials. This was expected because

alcohol is known to inhibit bacterial growth. The essential oils that had antimicrobial effects inhibited bacterial growth and showed a zone of inhibition around the well. In addition, essential oils with a greater inhibiting ability produced a larger zone of inhibition. This was demonstrated throughout the experiment and can be seen on Tables 1-6. Six different oil concentrations were used to determine at which concentrations each oil would be able to inhibit the growth of both bacteria. Overall, it took concentrations over 4 μl to effectively inhibit bacterial growth in all oils.

Tables 1, 2, and 3 shows the zone of inhibition of *E. coli* caused by the different concentrations of each oil. It was shown throughout all three trails that chamomile oil did not have any inhibitory effects on *E. coli*, while cinnamon oil and peppermint oil did. Cinnamon oil was able to inhibit growth of *E. coli* at concentrations 8 μl , 16 μl , and 32 μl . While peppermint oil inhibited growth at 16 μl and 32 μl . For both cinnamon and peppermint oil, it took concentrations over 8 μl for the oil to be able to inhibit growth. *S. aureus* was inhibited by each oil at some concentration across all three trials. Chamomile oil had the highest inhibitory effect on *S. aureus* using this method as it was able to inhibit growth at 4 μl , 8 μl , 16 μl and 32 μl . Peppermint oil and cinnamon oil had the same inhibitory effects at concentrations of 16 μl and 32 μl as shown in Tables 5 and 6. Both oils completely inhibited the growth of *S. aureus* as no growth was seen on these plates. At concentrations lower than 16 μl and 32 μl these oils were unable to inhibit growth and did not produce any zone of inhibition. While *E. coli* was inhibited by peppermint oil and cinnamon oil, the zone of inhibition around the wells in each trail were small as compared to the zone of inhibition created by these oils on *S. aureus*. For example, the average diameter of the zone of inhibition created by peppermint oil on *E. coli* at the 32 μl concentration was 1.9 cm, while the average zone of inhibited created by the same oil on *S. aureus* was 3.8 cm. This shows that while cinnamon oil and peppermint oil did have inhibitory effects on *E. coli*, the effects were greater on *S. aureus*. This also tells us that *E. coli* is slightly more resistant to these two essential oils than *S. aureus*.

Chamomile was the only oil seen to be ineffective at inhibition *E. coli* at all concentrations. Chamomile oil is known for its health benefits and therapeutic properties. It is also known to have components such as *a*-bisabolol and cyclic ethers which are known antimicrobial agents, according to Srivastava et al. Therefore, it was expected to have inhibitory effects on both bacterial species using this method. In *E.coli* species, chamomile oil showed to have no inhibitory effects at any concentration. A study conducted by Sakkas et al., tested the antimicrobial effects of five different essential oils,

one being chamomile, on four types of Gram-negative bacteria, including *E. coli*. Similarly, they found in their study that chamomile oil did not have any inhibitory effects on *E. coli* (Sakkas *et al.*, 2016). This study supports the data recorded in this experiment.

Broth Dilution

The broth dilution method was used to determine the minimum inhibiting concentration, or MIC, and minimum lethal concentration, or MLC, of each oil. The six different oil concentrations were added to nutrient broth and inoculated with each microbe. After a 24-hour incubation period, a subculture inoculation of each tube was taken to determine the MLC and MIC of the oil. The MIC was established by determining the lowest oil concentration that did not show any growth in the broth tubes as well as on the subculture inoculation plates. While, MLC was established by determining the highest oil concentration that did not show any growth in the broth tubes and subculture inoculation plates. Again, MSA and EMB agar were used for the subculture inoculations. Brain heart infusion broth or, BHI, without oil was used as the positive control and a water blank was used as the negative control. In all trials, no growth was seen in the water blank tubes and growth was seen in all tubes containing BHI. In addition, no growth was seen on any of the subculture inoculation plates of the water blanks. A colony count that was too numerous to count was seen on all the subculture plates of the BHI tubes in all trials both of these outcomes were expected.

The MLC and MIC of cinnamon oil was only able to be established in *E. coli* as the other two oils did not inhibit growth at any concentration. The MLC and MIC of cinnamon oil were both established at a concentration of 10^{-3} as that was the only concentration that inhibited growth of *E. coli*. On the other hand, the MLC and MIC were both able to be established for each oil for *S. aureus*. Chamomile oil and peppermint oil both had the same MLC and MIC of 10^{-1} and 10^{-4} respectively. Both oils were able to inhibit the growth of *S. aureus* at concentrations 10^{-1} , 10^{-2} , 10^{-3} , and 10^{-4} . Cinnamon oil had the lowest inhibitory ability on *S. aureus* with its MLC and MIC both being 10^{-3} . This method showed that while peppermint oil and chamomile oil are effective at inhibiting growth of *S. aureus* at four of the six concentration, these oils did not have the same inhibitory effects on *E. coli* as they did not inhibit growth at any concentration. This further shows that Gram-negative bacteria are more resistant to the antimicrobial abilities of essential oils than Gram-positive species.

Gram-Negative VS Gram-Positive

Throughout the course of this experiment, it was shown that overall *Escherichia coli*, a Gram-negative species, was more resistant to the three essential oils than *Staphylococcus aureus*, a Gram-positive species. Although, this did vary slightly in some trials. In all three of the experiments performed, it was shown that it took a higher concentration of oil to inhibit grow of *E. coli* as opposed to *S. aureus*. According to Nazzaro et al., generally Gram-negative bacteria are more resistant to essential oils than Gram-positive species. They attribute this to the different cellular makeup of the cell wall of Gram-negative and Gram-positive species. Gram-positive bacteria have a thick cell wall made of peptidoglycan and other molecules such as teichoic acid and lipoteichoic acid in which hydrophobic molecules can easily penetrate (Nazzaro *et al.*, 2013). According to Nazzaro et al., phenolic compounds found in essential oils show high antimicrobial activity against Gram-positive and can interfere with enzymes as well as denature proteins at a higher concentration. The Gram-negative cell wall is composed of lipopolysaccharides, or LPS, a peptidoglycan layer, and a periplasmic space. The LPS is composed of a Lipid A, oligosaccharide core, and the O-antigen which allows Gram-negative bacteria to be more resistant to essential oils. Porins allow small hydrophilic molecules to pass through the outer membrane of Gram-negative bacteria but does not allow hydrophobic molecules in, which Nazzaro et al., attribute to the greater resistibility of Gram-negative bacteria. This could be a possible explanation as to why *S. aureus* was more susceptible to the essential oils. A study conducted by Farag et al., also showed that overall Gram-negative bacteria have a higher resistance to essential oils than Gram-positive bacteria. This study also found that *E. coli* had a higher resistance compared to the other Gram-negative species they tested. Furthermore, a study conducted by Govec et al, showed that peppermint oil demonstrated a higher effect on Gram- positive species than it did on Gram-negative species. This study was consistent with the finding of this experiment.

Future Research

Multidrug resistant strains of bacteria are increasing and are causing a global health crisis among health care providers. Multidrug resistant strains of bacteria are resistant to a large amount of antibiotics making them extremely difficult to treat and, in some cases, almost impossible. However, there is promising research that shows that nanoparticles functionalized with essential oils have a significant antimicrobial potential against these multi-drug resistant strains of bacteria (Chouhan *et al.*, 2017). According to

Chouhan et al., these functionalized nanoparticles decrease the possibility of rapid evaporation of the essential oils and minimize the degradation of the active compounds in the oils. Chouhan et al., suggests that nano-encapsulation of essential oils along with the relationship between antibiotics, essential oils, and the active components of essential oils are a promising solution in the fight against multidrug resistant strains of bacteria. Essential oils are volatile substances that are sensitive to oxygen, light and heat which decreases their effectiveness. Therefore, nano-encapsulation of these oils is believed to be one of the most efficient methods of essential oil delivery because it decreases the likelihood of diminishing the oil (Chouhan et al., 2017). A study showed that components of essential oils such as thymol and carvacrol had a synergistic relationship with penicillin against *E. coli* and *Salmonella typhimurium*. This study also showed that eugenol, a component of cinnamon oil, showed synergism with ampicillin and gentamicin against various types of bacteria (Chouhan et al., 2017). Synergistic relationships seen between components of essential oils and commonly used antibiotics have been demonstrated in multiple studies. These relationships can be the future in the fight against multidrug resistant strains of bacteria.

Methodical Aspects

As with all research, there were a few errors that could have led to some inconsistencies throughout the experiment. One of the major issues that occurred during this research was that towards the end of the experiment, the peppermint oil used had ran out. Because of this, peppermint oil capsules were used as a replacement in which they had to be dissolved in sterile water. This could have effected the results because it was a different brand and type used. As discussed above, even though it was still peppermint oil being used, the levels of the phytochemicals in the two types may have been different, possibly leading to different outcomes. This could be seen in the results recorded in Table 20. Peppermint oil was unable to inhibit the growth of *S. aureus* using the agar dilution method in which the peppermint capsules were used. Using the other two methods, peppermint oil had successfully inhibited the growth of *S. aureus*. In addition, it would have been beneficial if the chemical composition of each oil was known. Knowing the level of each phytochemical in the oils would have allowed further analysis into why and how each oil effected the two bacteria in the way that they did. This would have also allowed us to dive further into phytochemicals and how they are isolated and used independently as an antibacterial agent.

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The Effects of Corporate Sustainability on Corporate Financial Performance

Graham Schmelzer (Business Administration)¹

This paper reviews the financial effect of implementing sustainability practices into corporate business models. The text examines a variety of sustainability practices, as well as the multiple financial implications of their implementation. The results show corporations which engage in sustainability practices can derive several benefits, including: increased stock market performance, reduced downside risk in turbulent financial markets, and increased customer satisfaction. This thesis shows the dynamic between external pressure on corporations for sustainability, and the effect of the implementation of sustainable practices on corporate financial performance. This research can be supplemented by further research into what specific sustainability practices are the most effective and garner the most returns for effort/cost.

I. Introduction

As consumers are becoming more vigilant of the world around them and watching how corporations affect the planet and society, reporting and quantifying the effect of sustainability practices on corporate financial performance is increasingly necessary. World governments and global media are emphasizing the importance of sustainability. Corporations are adopting sustainable practices in different ways, depending on their industry and objectives. For example, Nike, Starbucks, and Intel are all Fortune 500 companies in different industries, but all have exemplary sustainability practices. There is debate on whether corporations which engage in sustainable practices benefit financially. This thesis dissects the interaction between corporate sustainability efforts and financial performance. The insights learned will be useful for corporate executives and regulators; corporate sustainability is prevalent throughout today's major industries and will continue to grow in influence.

¹ Written under the direction of Dr. Shani Carter in partial fulfillment of the Senior Program requirements.

II. Literature Review

Aspects of Corporate Sustainability

The research used for this paper defines sustainability as meeting society's needs today without compromising future generations ability to meet theirs (Alshehhi, Nobanee, Khare, 2018). This definition comes from the 1987 Brundtland Report, entitled "Our Common Future," where the term "sustainability" was originally coined. For corporations, sustainability encompasses the environment, social impact, and governance practices. There are references to the "Triple Bottom Line" approach: people; planet; profit (Charter et al., 2006). This approach is intended to be used when c-suite executives make difficult business decisions or plan strategy.

There is a noticeable difference in how companies around the world utilize the Triple Bottom Line approach. In the United States, a highly competitive, capitalistic society, corporate management places an emphasis on maximizing shareholder wealth (Lumpkin & Bacq, 2019). This is contrasted by traditional business practices in places like Japan, which endorse the stakeholder wealth ideology (Stikeleather, 2017). Companies which embrace the stakeholder wealth ideology ensure firm earnings benefit all stakeholders, as opposed to just shareholders (Stikeleather, 2017). Shareholder theory, as practiced in the United States, does not account for all parties involved. American corporations are focused on share price and maximizing shareholder wealth, disregarding significant stakeholders such as employees and customers. In the long-term, practicing shareholder theory is potentially detrimental to society, and the firm itself (Stikeleather, 2017). In order to appease investors and attract business partners and customers, American companies are now adopting or creating customized sustainability efforts. For example, the coffee empire Starbucks continually anticipates market trends and adopts more sustainable practices. In 1997, the company invented the "hot sleeve," a replacement to the excessive consumption of "double cupping" (Kay, 2015). The efforts to be sustainable go by different names and acronyms: Corporate Social Responsibility (CSR); Corporate Sustainability (CS); Environmental, Social, and Governance (ESG); Corporate Governance (CG), and more.

Corporate Social Responsibility (CSR)

CSR is a company's commitment to manage the social, environmental, and economic effects of its operations responsibly and in line with public expectations (Business Development Bank of Canada, 2019). CSR manifests itself in many different ways depending on the company and the industry. Some organizations, such as Nike, enact policies which insist on working with partners who follow ethical business practices (Porter & Kramer; 2006). Other organizations, such as Johnson & Johnson,

reinvest profits in health and safety or environmental programs (Kelly, 2019). Corporations, such as Bank of America, often choose to support charitable organizations in the communities where they operate (Feeding America, 2012). CSR also includes promoting equal opportunities for men and women at the executive level, as seen in companies such as McDonalds (McDonalds Staff, 2019). CSR is a broad collection of strategies which companies can apply in their daily business operations to increase efficiency while enhancing their public image.

Environment, Social and Governance (ESG)

Environment, Social, and Governance (ESG) is the title which corporations and investors have placed on corporation's engagement with the broader term of "sustainability" (MSCI, 2019). It is a measure of the integration, values, and impact of a company's sustainability efforts. ESG refers to a business' impact on three specific areas: the environment, society, and government mandated reporting (MSCI, 2019). In practice, the term ESG is often used by the investment banks and financial firms of Wall Street during discussions about the sustainability efforts of a company. It is important to understand and recognize ESG as a technical term for a corporation's engagement in sustainable practices.

Corporate Governance (CG)

CG is a critical item on the agendas of investors, regulators, and policy makers around the world. Because corporations have significant influence on a wide range of socioeconomic activities, regulators and non-government organizations (NGOs) establish best practices for corporations to follow (Business Roundtable, 2016). These regulations, such as mandated quarterly financial reports, are required of publicly traded American firms. These types of regulations add to the costs and complexity of overseeing and managing a corporation's business activity, bringing new challenges from operational, regulatory and compliance perspectives. For example, the Securities and Exchange Act governs corporate behavior; federal securities acts are carefully monitored and enforced by the Securities and Exchange Commission (SEC). The regulations imposed by the SEC are a framework of minimum requirements for publicly-traded companies; the regulations give corporations the flexibility to implement customized practices that suit their needs (SEC, 2019). In an attempt to be cognizant of changing market conditions and standards, the SEC allows room for modification by trying to update regulations based on corporations' concerns/needs. However, some corporations find many of the regulations restrictive and/or distracting (Business Roundtable, 2016). CG is often discussed internally or from an investment perspective.

Corporate Sustainability (CS)

CS is the all-encompassing term for ESG, CSR, CG, and more (Eccles, Ioannou, Serafeim, 2014). Many modern corporations have a global profile; they interact with investors, suppliers, customers, and governments around the world at different points throughout the supply chain. The modern corporation's global exposure is all done in an era in which instant communication is the norm. Corporations are forced to be hyper aware of their business activities and their potential impacts at all times. Corporations are expected to deliver value to their customers, invest in their employees (as well as foster diversity, inclusion, and respect), deal fairly and ethically with suppliers, support the communities in which they work, generating long-term value for shareholders, and commit to transparency and effective engagement (Porter & Kramer, 2015). Corporations willingly engage in corporate sustainability practices to accrue various kinds of competitive advantage (Porter & Kramer, 2015). CS as a term is used internally and externally when comparing CS practices and financial performance (Eccles, Ioannou, Serafeim, 2014).

Sustainability's Relationship to Corporations

The United Nations Sustainable Development Goals (SDGs) are 17 goals for humanity set by the United Nations in 2015; the aim is to achieve these goals by 2030 (United Nations, 2015). The 17 goals include: No Poverty; Zero Hunger; Good Health and Well-Being; Quality Education; Gender Equality; Clean Water and Sanitation; Affordable Clean Energy; Decent Work and Economic Growth; Industry, Innovation, and Infrastructure; Reduced Inequalities; Sustainable Cities and Communities; Responsible Consumption and Production; Climate Action; Life Below Water; Life on Land, Peace; Justice and Strong Institutions; Partnerships. These goals are widely held as the standard for corporations and governments to adhere to (United Nations, 2015). In theory, all corporations and governments should consider these goals when making decisions, planning strategy, or reviewing business activity. The SDG's are all-encompassing; they are broad, yet detailed and based in science.

The publication of the 17 SDGs occurred the same year as the 2015 Paris Agreement, otherwise known as the United Nations Framework Convention on Climate Change (UNFCCC). The UNFCCC's central aim was to encourage a global response to the threat of climate change by keeping the global temperature increase below two degrees Celsius above pre-industrial levels (United Nations, 2015). UNFCCC is an actionable step to addressing goal number 13, Climate Action, from the United Nations' 17 SDGs; by bringing all nations from around the world together and getting

commitments from world leaders and developing nations, it set a precedent for corporations to follow in suit. In some cases, governments are partnering with corporations to create lasting innovations. In other situations, governments are enacting regulations, which come into effect along a specific timeline (U.S. Department of Energy, 2019). For example, the United States automotive industry is greatly impacted by State and Federal government regulation. Automobile emission standards are reviewed and updated annually; those car models which do not meet standards are forbidden to be sold in specified regions (U.S. Environmental Protection Agency, 2018). The UNFCCC is designed to be a motivator for governments and corporations alike, but it does not have any enforcement protocols (United Nations, 2015).

The United Nations has done a comprehensive job of outlining areas of improvement and has enabled many governments and institutions to take action. Business Roundtable, the premier non-profit organization on corporate regulation and oversight, hopes to expand upon the United Nation's vision. Specifically, Business Roundtable has been creating "Purpose of a Corporation" annual reports since 1997. These reports outline principles of CG which aim to protect value for stakeholders. This non-profit works to ensure more inclusive prosperity by committing to a free market economy and setting a standard for business practices (Business Roundtable, 2012).

Sustainability Rankings

Corporate sustainability performance (CSP) measures the extent to which a firm embraces the United Nations' 17 SDGs. It attempts to quantify how corporation factor CS into their operations as well as the ultimate impact a corporation exerts on the environment and society (Endrikat, 2016). The financial industry is shifting corporations towards corporate sustainability by placing and selling ratings of sustainability engagement (Endrikat, 2016). This process of CSP being measured and displayed is known as sustainability ratings.

Asset owners often rely on their consultants and managers to collect and analyze ESG data publicly released by corporations (Endrikat, 2016). Recently, third-party resources have emerged, which conduct their own sustainability investigations and summarize their findings; these reports provide investors with unbiased data to make better informed decisions about ESG investment (Lourenço, Branco, Curto, Eugénio, 2016). These third-party ESG research firms include MSCI ESG Research, Sustainalytics, and Vigeo EIRIS. Their research covers all asset classes and provides in-depth insight into multiple important ESG factors (MSCI, 2017). This easy access to data informs investors and allows for convenient comparison between companies and industries. More recently, some service providers are using big data, machine learning,

and artificial intelligence to better analyze the ESG information of companies (MSCI, 2017). However, even with the leading ESG research firms such as MSCI, Sustainalytics, and Vigeo EIRIS issuing quarterly reports, sustainability ratings are still in the early stages of development. More transparency on behalf of corporations is necessary before these ratings become truly reliable (Morgan Stanley, 2019). While investors currently use SEC mandatory earnings reports to inform investment decisions, there is no comparable required reporting for sustainability practices. Investors and clients still want portfolios with ethical and responsible companies, leading to the rise of sustainability investing (SEC, 2019).

Sustainability Investing

Sustainability investing is an investment discipline that considers environmental, social, and corporate governance criteria to generate long-term competitive financial returns and positive societal impact (Hoque, 2018). It entails evaluating an organization's position concerning the environment, health and security, social matters, and governance (Alpopi, Zaharia, Nicolescu; 2015). Sustainable investment strategies are being applied to portfolios because investors are now including ESG issues as a part of their investment analysis and selection process (Morgan Stanley, 2019). Sustainable investment practices are relevant for individual investors and institutional fund managers for retirement plans, corporations, educational institutions, philanthropic foundations, faith-based institutions, family offices, labor funds, health care funds, and nonprofit organizations (Morgan Stanley, 2019). Frequently, fund managers tailor portfolios for their clients who only want to invest in sustainable companies (Morgan Stanley, 2019). This strategy was confirmed in a study where 84% of global asset owners were pursuing or considering pursuing ESG integration in their investment process, while 78% of global asset owners sought to align their investment strategy with the United Nations SDGs (Morgan Stanley, 2019). Investors use multiple labels to refer to sustainable investing, such as: ESG Investing; Impact Investing; mission-aligned investing; responsible investing; socially responsible investing; values-based investing; among others (Morgan Stanley, 2019).

The key component of sustainability investing is the incorporation of ESG in investment analysis and portfolio construction across a range of asset classes (Lourenço, Branco, Curto, Eugénio, 2016). ESG incorporation can be done multiple ways: positive/ “best in class” screening involves selecting outstanding ESG performers relative to their industry; or negative/ “exclusionary” screening uses certain criteria to remove poor performers from ESG portfolios (Morgan Stanley, 2019). The variance in portfolio selection comes from investor preference. Certain investors want their personal philosophy to be reflected within their investment portfolio (Morgan Stanley, 2019).

Common exclusionary screenings avoid investments which are exposed to climate change, conflict risk (the risk of doing business in countries that have repressive regimes or sponsor terrorism), tobacco, human rights, and board accountability issues. Disclosure and management of corporate political spending and lobbying is also a major concern (Hoque, 2018). Money managers seem to agree that climate change is the most pressing ESG concern (Hoque, 2018). Nevertheless, sustainability investing is a growing financial vehicle across all asset classes. There are sustainability centered mutual funds, indexes, and ETFs. This recent trend has prompted corporations to be ever aware of their public perception because of the consequences of stock price and market capitalization (Kumar & Vinod, 2012).

Corporate Sustainability Marketing: Past, Present, and Future

There is an emerging trend of companies using corporate social responsibility (CSR) communication in their marketing efforts to enhance their corporate image (Parguel & Larceneux, 2011). Public relations and media campaigns inundate consumers with ads and overwhelm their attention with self-proclaimed “sustainable” acts (Porter & Kramer, 2006). This influx of “green marketing may be making publicized CSR initiatives less effective (Parguel & Larceneux, 2011). Ethical corporate marketing is a consumer concern, especially in the social media era, which allows for quick widespread sharing of misinformation (Kumar & Vinod, 2012). Corporations are more concerned with their reputation and satisfying external audiences than actual sustainability (Porter & Kramer, 2006). The negative impact of this movement has been coined “greenwashing”, which is the use of tactics to mislead consumers regarding the environmental practices of a company or the environmental benefits of a product or service (Parguel & Larceneux, 2011). To combat greenwashing, independent third-party sources have been developing sustainability ratings (MSCI, 2017). These ratings allow consumers to see an objective verification of a companies’ sustainability efforts and act as a way to ensure that companies are actually practicing their claims. Irresponsible acts, which cause negative effects in ESG, are known to negatively impact company reputation and valuation (Endrikat, 2016). This change in consumer sentiment toward companies and brands can be long-lasting. Strong CSR performance is crucial; it positively influences consumer’s attitude towards a firm, as well as their purchasing decisions. Research has found that consumers perceive hidden ulterior motives of companies which focus too intently on its CSR claims (Parguel & Larceneux, 2011). They also found consumers have difficulty evaluating the real impact of environmental innovations (Parguel & Larceneux, 2011). Customer confusion and corporate deceit are both reasons why sustainability ratings are valuable (Parguel & Larceneux, 2011). Sustainability

ratings inform consumers by providing summarized stakeholder's evaluations of CSR efforts.

Corporations research emerging social trends and understand the effect of their actions on stock price and market capitalization; this information leads them to tailor their practices to emphasize the more public aspects of their ESG initiatives (ICEE, 2012). In other words, companies have adopted different marketing strategies of their ESG practices in an attempt to gain competitive advantage and/or market share. There are different titles and strategies for the various methods of marketing: social/societal, ecological, green, and sustainability (Kumar, Rahman, Kazmi, Goyal, 2012). Each of these methods has its own unique emphasis, which makes them appealing to companies with different agendas and product offerings (Kumar, Rahman, Kazmi, Goyal, 2012). The goal of using sustainability marketing is to gain a position in the market which is "desirable, different, and defensible" (Kumar, Rahman, Kazmi, Goyal, 2012, p. 483). Society has already realized the importance and effect of corporations on sustainability issues; it is only a matter of time before engagement becomes a moral obligation (Endrikat, 2016). Companies have the ability to create a win-win approach by incorporating sustainability into products, services, and their marketing mix; the ability to increase profits even after reducing their negative impacts on the environment and society is a long-term competitive advantage.

Common CSR Implementation (Examples)

Case Study #1: Nike

Nike, Inc. is an American multinational corporation that is engaged in the design, development, manufacturing, and worldwide marketing and sales of footwear, apparel, equipment, accessories, and services. In December 1998, Nike's stock price was around \$6.50; this is a stark contrast when compared to Nike's stock price in December 2019 that hovered around \$91.00 (Yahoo Finance, 2019). Nike has grown significantly in the past 21 years, as shown by its rising stock price. Nike's rise to athletic apparel market leader can be attributed to many factors, however, the core of Nike's business model has always centered around innovation and low-cost manufacturing (Paine, Hsieh, Adamsons, 2016). In 2001, the company created a Corporate Responsibility committee spearheaded by the new Vice President of Corporate Responsibility and backed by Nike's Chief Executive Officer (Paine, Hsieh, Adamsons, 2016). This committee focused on analyzing Nike's supply chain and found solutions for problems. In particular, the committee mainly addressed problem areas, such as poor labor practices and negative environmental impacts (Paine, Hsieh, Adamsons, 2016). Nike supported projects such as Project Rewire, which revolutionized the processes by which Nike made its shoes: using

sustainable, ethically sourced materials, and humane manufacturing models (Nike, 2019). Innovative efforts like these made the company more effective and efficient. Nike was able to optimize manufacturing processes, consolidate its supply chain, and reduce their workforce by 5% (Paine, Hsieh, Adamsons, 2016). Simple business knowledge shows this increased production and reduced material/labor costs had a positive result on Nike's bottom line. This is only one example of Nike's sustainability efforts, however, it serves as a model for the company's continuous efforts over the past two decades. Nike's Corporate Responsibility committee shows that with executive support, win-win solutions can be created which benefit both society and the planet, as well as the sponsor company.

Case Study #2: Starbucks

The Starbucks Corporation is an American coffee company and coffeehouse chain. As of early 2019, the company operates over 30,000 locations worldwide (Starbucks, 2019). In July 2018, Starbucks announced it would begin phasing out plastic straws from its stores worldwide. The coffee company estimates it will prevent "billions" of single-use plastic straws from entering waste bins around the world (Starbucks, 2019). To replace the unwanted straws, Starbucks inventors created the new cold drink "Nitro Lid", which uses 9% less plastic than its predecessor (Starbucks, 2019). Starbucks is an example of how corporation-lead technological innovations can change consumer behavior and the default way of doing things.

Case Study #3: Intel

The Intel Corporation is an American multinational corporation and technology company headquartered in Santa Clara, California. Intel supplies processors for computer system manufacturers such as Apple, Lenovo, HP, and Dell (Intel, 2019). The Intel Corporation employs over 100,000 employees in 46 countries; the company has a significant impact on the environment and the communities it operates in because of the chemical intensive processes of semiconductor fabrication (Intel, 2019). In terms of corporate sustainability transparency, Intel is a leader in the semiconductor industry and the group of Fortune 500 companies. Intel releases annual Corporate Responsibility Reports which provide significant insight into its relevant sustainability efforts. In particular, Intel highlights Environmental Sustainability, Supply Chain Responsibility, Diversity/Inclusion, and Social Impact (Intel, 2019). Intel matches their reporting schedule with the United Nations Sustainable Development Goals; these goals are based in Science Based Targets (SBGs) (Intel, 2019). Intel's goal to reduce water use on a per unit basis to below 2010 levels by 2020 is currently on track: 2018 water withdrawals

decreased by 23% from the baseline year 2010 (Intel, 2019). Intel exemplifies proper sustainability reporting. Their above-board approach is beneficial to the company which now has a deep understanding of their supply chain, and metrics to measure their impact on the planet, and society.

III. Hypotheses

Corporations which engage in proper sustainability practices perform better financially than companies that do not.

IV. Method

Measures

In order to prove that corporate engagement in sustainable practices can provide increased financial outcomes, a clear definition of corporate sustainability and a proper understanding of corporate financial performance (CFP) measures is necessary. This paper analyzed multiple meta-analysis papers to summarize and conclude their findings; the papers chosen for analysis use a variety of financial measures to understand performance. For example, the stock price of publicly traded corporations is often used as a measure of corporate financial performance (CFP) (Alshehhi, Nobanee, Khare, 2018). Market capitalization (outstanding shares multiplied by stock price) is also commonly used in the financial world to show overall firm size (Alshehhi, Nobanee, Khare, 2018). Many studies use stock market sustainability indices (a segment of the stock market to make performance comparison easier), such as the Dow Jones Sustainability Index (DJSI), to measure the financial performance of sustainable corporations (Alshehhi, Nobanee, Khare, 2018). Accounting based measures, such as return on assets (ROA), return on sales (ROS), return on equity (ROE), return on investment (ROI), earnings per share (EPS), and price to earnings (P/E) ratios are also used to compare financial performance of sustainable versus unsustainable companies (Alshehhi, Nobanee, Khare, 2018). The peer-reviewed studies selected for this paper utilize all the mentioned methods of measuring financial performance. The variety of methods allows for more accurate results and conclusions.

Procedure

In order to find the optimal collection of data to study, research database tools such as EBSCOHost, GoogleScholar, and OneSearch were used. To find relevant sources, paired keywords such as “corporate social responsibility” with “corporate financial performance” or “ESG practices” with “market value” were used as search terms. These search terms garnered a collection of peer-reviewed research papers which

presented results from meta-analysis studies on stock market performance. To gather more sources about CFP's relationship with sustainable practices, the term "sustainable practices" was used loosely. The data used for this paper came from studies which used terms such as "Corporate Social Responsibility (CSR)"; "Corporate Sustainability (CS)"; "Environmental, Social, and Governance (ESG)"; "Corporate Governance (CG)", and more. This methodology of searching yielded positive results; this topic is currently a popular subject in the financial realm. Many studies have been conducted by business schools, research firms, and investment banks alike to understand more about sustainability and its relationship with corporate financial performance. Due to the high volume of peer-reviewed data, other researchers have created meta-analysis studies. Meta-analysis papers summarize results from other peer-reviewed studies; researchers create meta-analysis reports to highlight the majority opinion and glean recurring insights which appear across studies. This paper uses these meta-analysis papers as the groundwork and results for this thesis. The strategy to analyze meta-analysis papers allows for exposure to the great variety of research results without exhaustive data collection. By using a diverse group of sources through meta-analysis papers, there is also a greater likelihood of finding accurate results. When choosing sources, only studies which meta-analyzed the greatest number of papers were selected.

V. Results

CSR Positively Affects Stock Performance

Despite the differences in research methodologies and research subjects (corporation size, industry, and market), 78% of 132 different peer-reviewed journal publications (figure 1) report a positive relationship between corporate sustainability and financial performance (Alshehhi, Nobanee, Khare, 2018). Although the studies each measured the effect of sustainability on CFP in different ways, the results are overwhelming: there is a positive relationship between sustainability practices and CFP.

Another study found sustainable funds at least match the returns of comparable traditional funds (Morgan Stanley, 2019). This came from a performance analysis of over 10,723 mutual funds between 2004 and 2018. These results show there is no financial trade off in the returns of sustainable funds compared to traditional funds (Morgan Stanley, 2019). Morgan Stanley's research also found differences in total returns between sustainable and traditional funds are narrow and inconsistent (Morgan Stanley, 2019). In Q4 2018, October 1st to December 31st, volatility in American markets rose considerably; however, the median sustainable fund outperformed the median traditional fund by 1.39% (Morgan Stanley, 2019). As the benefits of sustainable funds become

more well known more investors are seeking to invest in ESG-focused funds, as shown in Figure 2.

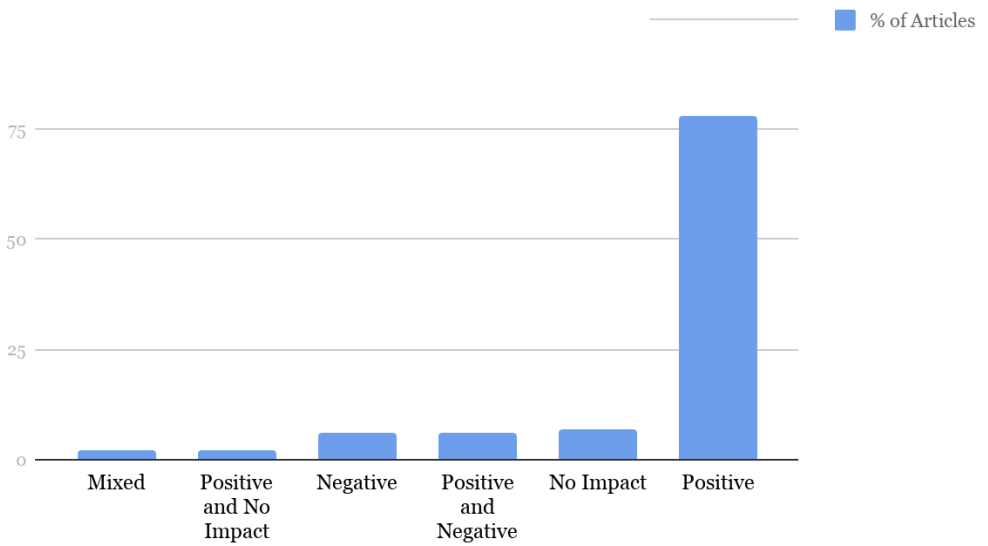


Figure 1: Impact of sustainability on corporate financial performance. Source: Alshehhi, A., Nobanee, H., & Khare, N. (2018).

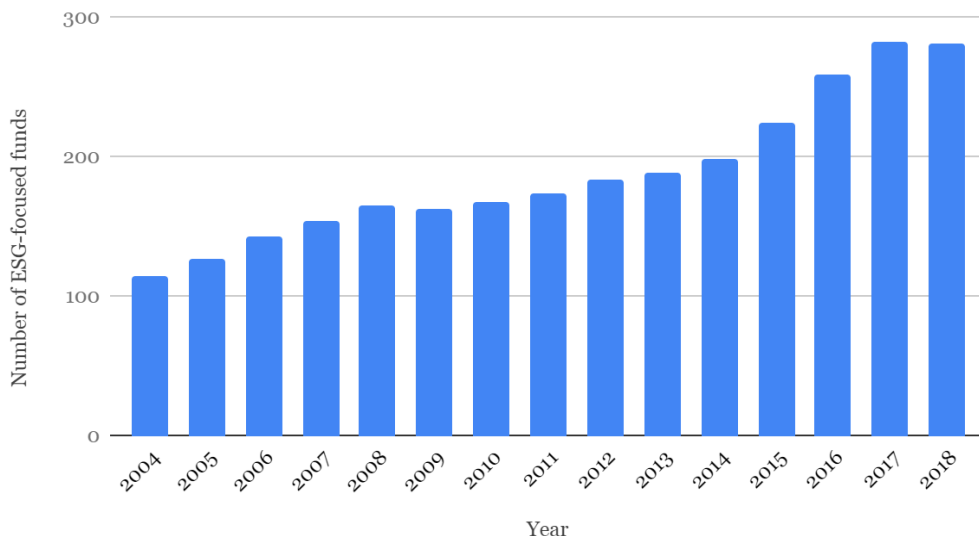


Figure 2: The number of ESG-focused funds has grown 14.4% since 2004. Source: Morgan Stanley. Sustainable Reality: Analyzing Risk and Returns of Sustainable Funds. Morgan Stanley Institute for Sustainable Investing, 2019.

The results from another meta-analysis study indicate a positive relationship across research in terms of positive market reactions to positive CSR-related events and negative market reactions to negative CSR-related events (Endrikat, 2015). This research paper included 32 studies which analyzed CSR-related events and stock performance (Endrikat, 2015). The analysis concluded positive reactions to positive events and negative reactions to negative events were both true (Endrikat, 2015). Interestingly, reactions tend to be slightly stronger for non-US samples than for US samples (Endrikat, 2015). Evidence which align with Endrikat’s findings can be found in the stock market reactions to a 2018 ESG-related event with the electric car company Tesla Motors figure 3). Tesla’s CEO, Elon Musk, sent a tweet which the SEC claimed “mislead” investors (SEC, 2018). Upon the August 13th announcement of Musk’s charges, Tesla stock dropped by 18.89% (Yahoo Finance, 2019). This is an example of a negative CSR-related event and subsequent negative stock market performance.

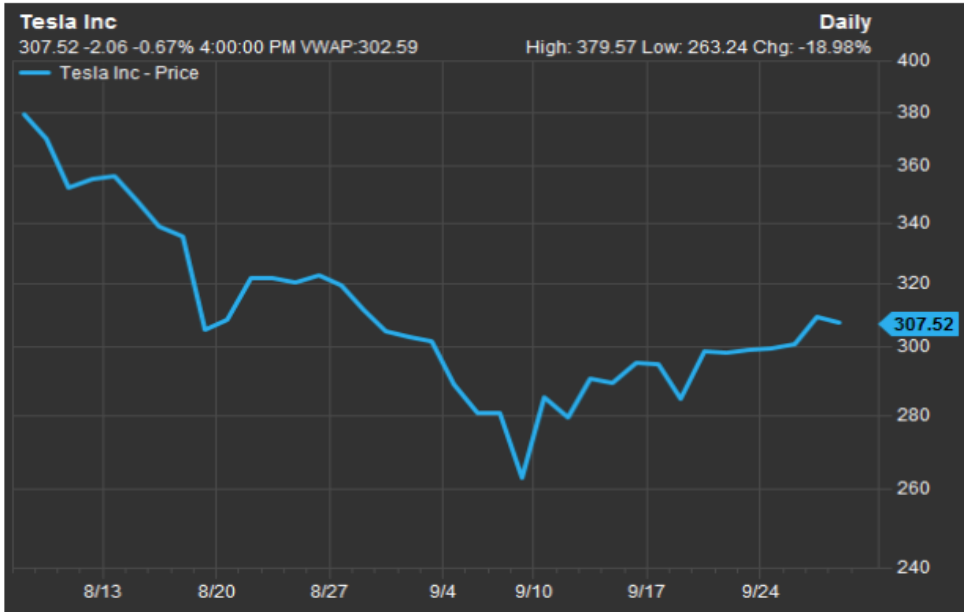


Figure 3: Tesla Interactive Stock Chart. Source: Yahoo Finance. (2019). TSLA Interactive Stock Chart | Tesla, Inc. Stock. Retrieved 2019, from <https://finance.yahoo.com/chart/TSLA>.

Of North American firms, research suggests negative CSP has significant explanatory power for decreasing stock prices (Lourenço, Branco, Curto, Eugénio, 2016). However, it is also shown that the market does not penalize all the corporations with low levels of CSP. On the contrary, the market penalizes only those firms with incentives to present a high level of CSP but do not actually engage in such a strategy (Lourenço, Branco, Curto, Eugénio, 2016). The corporation's size and profitability seem to matter in market interpretation of CSP (Lourenço, Branco, Curto, Eugénio, 2016).

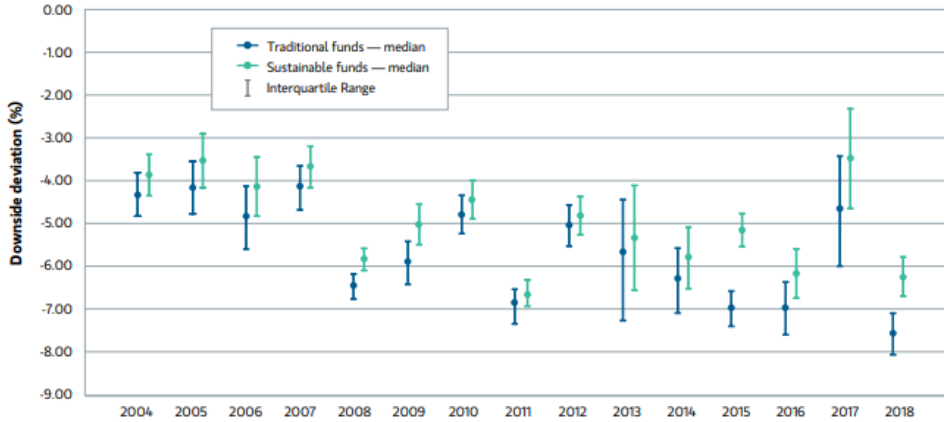
CSR Reduces Downside Risk in Volatile Markets

Findings suggest that investors penalize large profitable corporations with low levels of CSP (Lourenço, Branco, Curto, Eugénio, 2016). Interestingly, an asymmetry in the stock market reactions has been found; there are stronger reactions to negative CSP-related events than to positive CSP-related events (Endrikat, 2015). Examples of negative CSP-related events include negative environmental news, negative labor force news, and violation of local or federal laws (Endrikat, 2015). The great negative reactions of the

stock market expose non-sustainable companies to risk (Morgan Stanley, 2019). This is why sustainable funds also reduce downside risk when compared to traditional funds in the same industry (Morgan Stanley, 2019). In years of turbulent markets, such as 2008, 2009, 2015, and 2018, sustainable funds downside deviation (a measure of risk) was significantly smaller than traditional funds (Morgan Stanley, 2019). As shown in Figure 4, sustainable funds consistently show a significantly lower downside risk than that of the traditional counterparts, regardless of the asset class held (Morgan Stanley, 2019). This result has been quantified by a 20% reduction in downside deviation (Morgan Stanley, 2019).

How CSR Relates to Customer Satisfaction

Companies with good CS reputation are able to improve relations with external actors such as customers, investors, bankers, suppliers, and competitors. (Lourenço, Branco, Curto, Eugénio, 2016). They are also able to better attract prospective employees and increase motivation for current employees. CSR can be much more than a cost, a constraint, or a charitable deed - it can be a source of opportunity, innovation, and competitive advantage (Porter & Kramer, 2006). The connection between good deeds and consumer attitudes is so indirect it would be impossible to measure (Porter & Kramer, 2006). An organization's ethical climate (integrated sustainability practices) is positively related to customer satisfaction and perceived organizational innovation (Moon & Choi, 2014). An organization's ethical business can provide a favorable image to customers and develop a positive attitude toward the organization (Moon & Choi, 2014).



| | | | | | | | | | | | | | | | |
|--|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Sustainable Funds | -3.86 | -3.52 | -4.14 | -3.66 | -5.83 | -5.03 | -4.44 | -6.66 | -4.80 | -5.32 | -5.80 | -5.14 | -6.15 | -3.47 | -6.24 |
| Traditional Funds | -4.29 | -4.16 | -4.82 | -4.12 | -6.43 | -5.87 | -4.79 | -6.88 | -5.02 | -5.66 | -6.30 | -6.96 | -6.96 | -4.59 | -7.56 |
| Difference (Sustainable - Traditional) | 0.43 | 0.64 | 0.68 | 0.46 | 0.60 | 0.84 | 0.35 | 0.22 | 0.22 | 0.34 | 0.51 | 1.82 | 0.80 | 1.11 | 1.32 |
| Statistical Significance | 99%+ | *** | | 95%+ | ** | | 90%+ | * | | | | | | | |

Figure 4: Median Downside Deviation of Sustainable and Traditional Funds, 2004-2018. Source: Morgan Stanley. Sustainable Reality: Analyzing Risk and Returns of Sustainable Funds. Morgan Stanley Institute for Sustainable Investing, 2019.

VI. Discussion

This thesis is centered around understanding how corporations integrate sustainable practices into their business models and the correlated effect on CFP. Research suggests there is a positive relationship between corporate sustainability and financial performance. Furthermore, the integration of sustainable practices reduces the downside effects of turbulent markets. Since CFP can be defined and measured in many different ways, it is surprising and reassuring that the results from the 20 plus sources used all support the hypothesis. The various researchers who conducted studies on sustainable practices and CFP seemed to agree that it is beneficial for corporations to engage in sustainability efforts. Each individual study used as evidence is unique and highlights different aspects of sustainability. The results of these studies also show different sustainable practices benefitting a different measure of CFP.

Investors look at CG as a measure of investment opportunity. Sustainability ratings impact investor sentiment. Sustainability ratings are not perfect; they are often created by different third party sources with limited amounts of data. The government and the general public should place more pressure on corporations to publicize their sustainability efforts. If corporations released their sustainability efforts publically, it would allow for sustainable practices to be optimized. Public corporations sharing their sustainable practices and implementation costs would allow companies to see which processes are the most effective. The best approaches would be identified and eventually adopted across industries. The mass adoption of sustainable practices by corporations across industries would benefit society and the environment. Public disclosure of sustainable practices would also allow for better informed investment decisions. More knowledgeable investors make markets more efficient because the trading price is closer to true value. Understanding how investors look at corporate sustainability is necessary to predict how corporations will make strategic decisions moving forward.

Many corporations see the benefits of implementing sustainable practices into their business model. Some companies, such as Nike, Starbucks, and Intel, have implemented sustainable practices; others just claim to do so. Dishonest corporation's false advertising has led to distrust from customers and investors. In an age of instant media, it is hard for consumers to tell which companies are honest, and which are not. Dishonest corporations falsely advertise because they see the benefits of investor perception of sustainable corporations. Corporate marketing strategies play to change consumer perceptions.

CFP is largely dependent on how consumers and investors perceive the sustainability of a corporation. This is why accurate marketing and full disclosure of sustainable practices is necessary. Consumers which watch companies incorporate CG, CS, ESG, and CSR into their business model are rewarded for their efforts. Corporations which do not, suffer the short term and long-term consequences.

VII. Conclusions

Implications for Practice

The analysis of peer-reviewed studies examining CFP's relationship with CS practices have shown corporations who engage in sustainability practices gain multiple benefits, including: increased stock market performance (Alshehhi, Nobanee, Khare, 2018) (Endrikat, 2015) (Lourenço, Branco, Curto, Eugénio, 2016), reduced downside performance in turbulent markets (Morgan Stanley, 2019) (Lourenço, Branco, Curto,

Eugénio, 2016) (Endrikat, 2015), and increased customer satisfaction (Lourenço, Branco, Curto, Eugénio, 2016) (Porter & Kramer, 2006) (Moon & Choi, 2014).

Implications for Future Research

This research clearly shows the positive effects of sustainability practices on a corporation. These findings can be supplemented by further research into what specific sustainability practices are the most effective and garner the most returns for effort/cost. There is a need to understand which specific sustainability practices garner the greatest impact on the environment and society with the least financial impact on corporations. An in-depth analysis of the overhead costs, maintenance costs, and operational costs for sustainable practices will need to be conducted across corporations of all sizes, industries, and markets. These metrics will create an accurate baseline. Corporations understand the value of a good sustainability-related reputation; the benefits are overwhelming. However, despite the unprecedented amount of evidence, corporations still knowingly engage in negative sustainability practices. Corporate inaction is destructive to society and the environment. More research is needed in how to reduce the costs of implementing sustainability practices. If the entry threshold is lowered, more companies will participate in sustainable practices. Research into sustainability and its effect on CFP will always be valuable. New studies add to the large body of evidence which are used to convince corporations to be more sustainable.

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Section II: The Social Sciences

The Epidemic of Depression in National Collegiate Athletic Association Student-Athletes

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Collegiate Sports in the United States is one of America's favorite pastimes, not only for the athletes participating but for spectators attending competitions, viewers tuning in on national television and stakeholders in university programs. The National Collegiate Athletic Association (NCAA) has developed a community of athletes and avid fans, coining the term "student-athlete." These elite athletes who have committed to compete within the NCAA for their respective universities are contracted to abide by the laws of their governing organization. Bylaws under the NCAA regulate academic integrity of their athletes, and their athletic careers at a cost that could be detrimental to their health. Unbeknownst to many, the "glamorous" life of the collegiate student-athlete, has taken a darker turn for many who are unable to cope with stressors of their commitment. For decades participation in athletics has given its members physiological and psychological health benefits contributing to their overall well-being. In more recent years, this has changed due to increased emphasis in athletics by the NCAA. Universities participating in the NCAA must consider taking the time to protect the health of their student-athletes to ensure a safe environment. Proposed solutions that athletic departments can choose to implement to promote the health of the NCAA student-athletes include regulation of physical and psychological screenings and therapy, as well as interdepartmental decrease of practice times.

I. Introduction

The National Collegiate Athletic Association (NCAA) is the largest amateur sports organization in the world, having more than 460,000 athletes participating each year (National Collegiate Athletic Association, 2018). The participating athletes compete across a variety of twenty-four sports under one of three divisions. The NCAA has coined the term "student-athlete," governing an association requiring full-time college students

¹ Research presented at a Sigma Theta Tau sponsored research event on April 10th at Wagner College.

² Written under the direction of Prof. Tinamarie Petrizzo-Hughes in partial fulfillment of the Senior Program requirements.

to simultaneously practice and compete as athletes. Student-athletes are under binding contracts with the institutions that regulate their lives on campus.

Athletes have been characterized as resilient, self-confident, driven, and high performing people. The sustainability of the fixed and oversimplified image of a “student-athlete” does not come without a cost, which oftentimes can lead to a strain on the mental health of these young adults. Regulating the balance between education and athletics was deemed necessary by the NCAA to help aid in the time management of their student-athletes. The solution resulted in a weekly ratio of twelve classroom credit hours to twenty athletic hours. The challenge of balancing and fulfilling highly demanding academic and athletic requirements has contributed to an epidemic of depression in the NCAA (National Collegiate Athletic Association, 2018).

Depression places student-athletes at an increased safety risk for the use of ineffective coping mechanisms, and even suicide, as an answer to their fight with this mental illness (Mayo Clinic, 2018). The rising diagnosis of depression within the student-athlete population of the NCAA has led to the demand for an intervention. Policies regarding mental health interventions in the NCAA need to be prioritized for the safety of this potentially vulnerable population.

II. Community Assessment and Analysis

On college campuses a diverse population of students is represented. Whether it is age, gender, race, academic major or extracurricular activities, subcultures and communities are formed. The student-athletes competing in the NCAA are widely diverse; however, they come together to form a small and highly specified community. Student-athlete ages on average range between 18-25 years, and the group consists of men and women from multiple ethnicities and races (Rao & Hong, 2015).

Lapchick, Augusta, Kinkopf, and McPhee (2013) provide information about gender and racial distribution amongst these athlete participants. In the 2011-2012 season, male participation was 13.4% higher than female participation: recording 56.7% of participants identifying as male and 43.3% as female. The two most represented races in the NCAA are Caucasian and African-American. Respective statistics in the 2011-2012 season reveal that Caucasian males make up 69.4% of the NCAA male athlete population with only 16.2% of African-American descent. Comparatively, of the women who participated, 76.2% were Caucasian and 8.6% African-American. The diversity of the community has positively increased since the 2007-2008 season where the racial profile of the top two most represented groups by gender were Caucasian 74.5% male athletes and 83.6% female, 16.1% African American males and 6.8% females.

Unique factors that arise in the athletic departments of colleges have a positive influence on many of the athletes and the general student population. Athletic revenue produced is used to not only benefit teams and coaches, but also facilities that the general student population may use to promote their own health. The most notable benefit which only athletes are eligible for is athletic scholarships. This, however, comes with a price tag that one must conform to the NCAA's definition of a student-athlete. The bylaws presented by the NCAA committee regulate the academic schedules of students and athletic demands of their participants. Guidelines, instituted by the organization, may lead to the high prevalence of depression found in student-athletes and it could be a critical problem within the community. The prevalence of depression in college-aged students in the U.S. ages 18-25 is 8.7% with studies showing significantly higher prevalence rates among student-athletes resulting in 15.6% to 21% reporting depression (Rao & Hong, 2015).

Depression has been studied and the evolution of risk factors for the disease have been derived from low self-esteem, self-criticism, stressful events, financial problems, genetics, history of mental health disorders, abuse of alcohol and drugs, and chronic illness and pain (Lennon, 2015; Mayo Clinic, 2018). Every day, student-athletes struggle with these risk factors and, if uncontrolled, have more to lose than students who do not participate on NCAA teams, proportionally increasing their risk for depression.

The term student-athlete is dissected into two parts; the NCAA regulates both academics and athletics. NCAA guidelines state to be considered a student; a person must take at minimum 12 credit hours per term (National Collegiate Athletic Association, 2018). A full-time students' schedule does not leave an extensive amount of time for extracurricular activities. The NCAA has allocated a maximum of 20 hours per week for mandatory athletic participation (National Collegiate Athletic Associations, 2018). The stress of juggling class and athletics is heightened under the 2.3 Grade Point Average (GPA) requirement student-athletes must achieve to continue to secure their roster spot and obtain their financial scholarship allotted from the Athletic Department. While this appears to be a minimal goal, it does not come easily during a week, when averaging 3.3 hours of practice daily can cause sleep deprivation and fatigue (Trojian, 2015). The athletic demands have been shown to lead to injury, exhaustion, and fatigue (Rao & Hong, 2015). Student-athletes may seek "easy fixes" in the form of maladaptive coping mechanisms to handle the pressure and loss of equilibrium between the mind and body. Binge drinking is one such mechanism. Its prevalence can lead to high-risk activities such as substance abuse and depressive behavior, with effects can be as severe as suicidal

impulsivity. Suicide is the fourth leading cause of death in student-athletes (Rao & Hong, 2015).

Those at highest risk are males, African-Americans, freshmen, and football players (Rao & Hong, 2015). The participation in football increasing one's risk for depression is explained by the theory that violent sports have higher rates of inappropriate behavior (Rao & Hong, 2015). The epidemic of depression does not come from football alone as Title IX, which was implemented in 1972, established the Equal Opportunities Act for all genders participating in NCAA sports (National Collegiate Athletic Association, 2018). Title IX mandates that the monetary worth of athletic scholarships and resources for teams between men and women remain equal. Freshman students entering their collegiate academic and athletic careers are at high risk for depression as they are a vulnerable population. Maturation crises are experienced in those whose coping mechanisms are no longer adequate because of new stressors they are encountering in their life cycle. Feelings of social isolation and loss of social connectedness when removed from one's family during freshman year, the holidays, and summer vacation or athletic penalties such as suspension from a team due to injury, increase the likelihood of experiencing depressive symptoms in these young adults. Injuries have been shown to be a risk factor in the community causing feelings of interrupted social structure and lowered self-worth (Rao & Hong, 2015, see also Maron, Haas, Murphy, Ahluwalia, & Rutten-Ramos, 2014).

Scholarships play an important role in the level of stress felt by student-athletes. The NCAA is not only a governing body for athletic participation but also a business. The rules created by the NCAA are to help them remain sustainable as an organization and many times overshadow the mental health needs of its participants. Student-athletes who are not living up to their contracts in regards to performance and physical abilities which include avoiding injury are in danger of losing their scholarships (Trojan, 2015). The NCAA must balance scholarships in accordance with money earned off their athletics. The continuum of the organization can only succeed under the generosity of outside funding produced by the entertainment the athletes provide their fan base. For many, this state of financial insecurity places them under mental strain. The opportunity of college for many student-athletes was given to them due to their athletic talent.

Athletes who perceive their injuries as their bodies failing them increase the risk of this mental health disease. The financial state of these student-athletes can be altered with the immediate revoking of their scholarships which can result in the inability to afford their college education. This is a life-altering consequence.

This epidemic is an alarming community disease and solutions must be implemented to improve the health of this population. The NCAA has begun studying the rise of mental illness within their community thus initiating ways the NCAA can effectively work with their associated colleges to provide a mentally healthy and safe community (National Collegiate Athletic Association, 2018). The Mind, Body and Health initiative created by the NCAA is designed to promote general well-being for their athletes. Additionally, the NCAA has included community resources such as the student health services under the care of nurses and psychiatrists, the team physician, an orthopedic specialist, and physical trainers to evaluate student-athletes for depression (Rao & Hong, 2015).

III. Problem in the Community

The prevalence of depression in the NCAA student-athlete community is clinically relevant. Among non-athletic American adults aged 19 or older in 2016, it is estimated that nearly 6.7% had symptoms of a depressive disorder or experienced depressive episodes (National Institute of Mental Health, 2017). While comparing U.S. adults to NCAA student-athletes, student-athletes show almost four times the number of depressive symptoms than adults throughout the nation. In a survey-based study of 465 Division 1 athletes of all genders, races, and academic grade levels, “23.7% of athletes scored a clinical level of depression with a CES-D >16 and 6.3% of athletes showed a moderate to severe level of depression with a CES-D >27” (Wolanin, Hong, Marks, Panchoo, & Gross, 2016) on the Center for Epidemiologic Studies Depression Scale. “There was a significant gender difference in prevalence of depressive symptoms with female athletes exhibiting 1.844 times the risk of male athletes for endorsing clinically relevant symptoms” (Wolanin et al., 2016).

Although scientific experiments supported exercise to be a preventative treatment for managing depression, becoming a college athlete does not guarantee psychological wholeness. Many athletes are exhibiting depressive symptoms from the intense psychological pressure they are held accountable for throughout the course of being a student-athlete. Some consider it a full-time job due to the athletic scholarships applied towards tuition. Students worldwide move to the United States to participate in the NCAA for a better opportunity. These athletes are able to pursue their athletic and academic careers at a fraction of the cost of their home countries.

Depression amongst NCAA Division 1 athletes is a problem that if left untreated can be detrimental to the athletic community. The symptoms of depression may include hopelessness, despair, anxiety, worthlessness, guilt, helplessness, anger, loss of

concentration, inability to solve problems, decreased clarity, delusions, slowing of psychomotor reactions, and agitation. Additionally, student-athletes experiencing depression may encounter issues regarding grooming and hygiene, change in sleep patterns, change in bowel habits, decline in sex interest, and vegetative states (Halter, 2018).

Clinically depressed college athletes oftentimes turn to drugs and alcohol as a coping mechanism to deal with their depression. Depression amongst student-athletes often goes unnoticed and is thought to be a sign of weakness. Untreated depression can significantly impact one's professional aspirations, quality of life and may even result in suicide. Studies show that suicide is the number one leading cause of preventable death in NCAA student-athletes with the highest prevalence in football, track, cross country, baseball and swimming. Caucasian males are the most likely to kill themselves by gunshot or hanging. As a requirement of the NCAA and academic institutions, student-athletes are held to a higher standard, they cannot fall behind in the classroom while participating in sports. College athletes are required to take the same number of courses and credits as a typical college student and they are also required to maintain a certain GPA, as per school requirements, in order to be academically eligible to participate in intercollegiate sporting events.

Risk factors often associated with depression in college student-athletes differ from ones in non-athletes. Some predictors of risk include being a freshman, injury, substance abuse, and academic stressors (Armstrong & Oomen-Early, 2009). The demand of sports has increased alarmingly as indicated in the aforementioned survey of 465 Division 1 athletes. Student athletes are held at a high standard to excel on the field as well as in the classroom, putting them at a greater risk to develop a mental health disorder such as depression.

IV. Proposed Solution

Mental health awareness is currently at the forefront of the medical community. It is important to have the necessary tools to recognize early symptoms of depression. The NCAA would benefit from screening tools for early recognition of depression. The PHQ-9 is a nine-question survey with a cut-off score of five or more; it has "95% sensitivity and 88.3% specificity when scored with a cut point of 11" (Trojian, 2016). The PHQ-9 test could be given during pre-season for a baseline and then again midseason and postseason. As an increased effort to ensure safety, any athlete that endures serious injuries during a season will also be screened. The main point of giving the PHQ-9 is to be proactive and to identify any changes between tests so that they could be addressed

prior to harmful effects. If any student athlete receives a score of five or above, then they could be evaluated with a second screening called the Beck Depression Inventory (BDI). “The BDI-II has good sensitivity and specificity and excellent reliability” (Trojan, 2016). It is desirable for the Athletic Department to be equipped and ready to properly handle student-athletes who are showing signs of depression. Given the reluctance of student-athletes to report challenges with mental well-being, coaches, team physicians, and athletic trainers are a good potential line of defense in encouraging their athletes to seek help when needed (Davoren & Hwang, 2014). If students fall under a depressive category on the BDI, then a care plan should be implemented to help alleviate depressive symptoms.

For years, athletes were expected to “rub some dirt on it and keep playing” and their mental and physical health needs were ignored. Maslow’s Hierarchy of Needs supports the proposed solution by showing the necessary needs that must be met for a student-athlete to be successful on and off the field. Physiological needs are at the bottom or base of the pyramid. These needs include food, water, shelter, and rest. Student-athletes are not only expected to wake up early and perform on the field, but also expected to perform in the classroom immediately following practice. On some days they are lucky to grab food to eat while sitting in lecture. Following lecture, they are expected to study for hours and do any homework before bedtime so they can hopefully get some rest to do it all again the next day. This cycle goes on six days a week for in-season athletes. Sleep deprivation has numerous consequences like a weakened immune system, memory issues, lack of concentration, and mood changes. The next rung in the pyramid is safety needs. Athletes are expected to push their bodies to their maximum limits with every practice, weight lifting session, and game. The risk for injury is very high. The following level on the pyramid is belongingness and love needs. Being on a team of course has its benefits, but it also comes with negatives. Athletes are with their teammates more than most others on campus, thus, there is social isolation from non-athletic students due to their rigorous schedules. Many athletes may try to “fit in” on the team. If an individual is not getting along with their teammates, they are at risk for loneliness and further isolation. Second from the top of Maslow’s hierarchy of needs is self-esteem. Many individuals who are recruited for college sports were highly successful in high school. However, when they come to college, they are not guaranteed to be the best anymore and for many that is an enormous adjustment. This may affect their self-esteem as they once started and played many minutes and now they are on the bench. Many athletes associate sports as a large part of their identity, and without playing they may feel lost or have an identity crisis which can lead to an increased loss of self-esteem.

At the peak of the pyramid is self-actualization needs. Without achieving all of the aforementioned needs listed, a human being will not effectively achieve self-actualization.

One innovative health program that all athletic departments should adopt is to hire a sports psychologist. Although sports psychologists are relatively new in the world of sports, they are an extremely beneficial addition to every athletic department. Another health program schools should incorporate is mental health basic training. Athletic departments should mandate that all coaches and sports staff attend training on how to recognize and manage athletes who are showing signs of depression. Early recognition is crucial. When coaches are able to recognize an issue, they can require screening and appropriate interventions for these students, which will enable a healthy, happy, and productive student-athlete.

Mandating screenings and staff training is cost effective, beneficial, and a realistic solution to implement across the country. As part of their contract with the NCAA institutions, sports staff would be required to utilize online modules before the start of each season to recognize the early signs and symptoms of depression. The goal is to detect the symptoms early. The PHQ-9 scale in addition to trained sports staff creates two lines of defense to prevent the detrimental effects of depression. We all share a common goal of maintaining a safe and productive environment with which our student-athletes can grow and thrive.

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Section III: Critical Essays

The Structure of Repression and Trauma in *Slow River*

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In Nicola Griffith's *Slow River*, the dysfunctions in the van de Oest family force each member to navigate deep psychological issues. The abuse and secrets in the family, as well as the massive power of the family business, cause the three sisters Lore, Stella, and Greta to suffer. Each of them withstands the family's dysfunctions as well as abuse from their mother, which ultimately cause them to lose a stable sense of themselves, and for some, the ability to develop any mature adult relationships. These unresolved conflicts in each of their lives cause them to behave in unhealthy ways. Lore is eventually able to recover and develop a stable relationship with Cherry Magyar, but unfortunately Stella and Greta do not reach such a moment. Lore, Stella, and Greta van de Oest develop repressed trauma which reveals details about their lives, their sense of self, and their anxieties.

After finally escaping her kidnappers and her dysfunctional family, Lore must live with a slew of repressed wounds and fears which unconsciously motivate her to start a life she knows she will hate. Lore repeatedly tells herself that her family has not paid her ransom, as she has no way of knowing otherwise, and this hurts her. For Lore, this means she can never return to them. Yet, Lore often catches herself thinking of her father or her brother Tok, or talking wistfully of the family island estate, called Ratnapida, unaware of her subconscious desire to resolve the conflict and reunite with them. On one of her first nights at Spanner's, she "tried to imagine she was at Ratnapida, lying on the grass. The birdsong was all wrong" (Griffith 13). Because she believes the family will not pay her ransom, and is freshly traumatized by strange kidnappers, Lore develops a fear of emotional abandonment. This fear causes her to believe that her family does not care about her and influences her to stay with Spanner for much longer than she might have if she had felt the support of her family. Lore tries desperately to connect with Spanner, in order to develop that same kind of supportive relationship she craves, but Spanner keeps Lore at a strict distance and rejects almost every attempt Lore makes to learn more about her. Without the same solid ground of support that she is used to, at least from her father and brother specifically, Lore feels lost in her new path and stuck in a life of crime and

¹ Written under the direction of Dr. Susan Bernardo for EN 212: *Introduction to Literary Analysis and Theory*.

degradation. As the novel progresses and Lore continues to stay with Spanner, she becomes more and more disconnected from her former identity.

Lore also has a very unstable sense of self which stems from the juxtaposition of her former life as a rich kid and her new life of struggle with Spanner. Lore feels ready to forget her former identity and build a new one, but she struggles to create a sense of herself while she is with Spanner. Lore believes that she must completely forget her former self in order to create her new self, rather than accept all the different, contradictory parts of herself, past and present, in order to create the truest version of herself. Due to the unresolved conflict involving sexual abuse from her mother, ignorance from her father, and the sudden death of her sister Stella and the questions surrounding it, Lore unconsciously ignores these things so that she will not have to solve any of the underlying issues. Therefore, Lore struggles with juggling different identities rather than letting the past be a part of her current sense of self. She sees herself as having three identities: the rich kid, the criminal, and the waste-water treatment worker. Lore views these identities as completely separate from each other. She reflects, "I had an eerie sense of multiplicity, of staring down at my reflection in the water and seeing three faces instead of one" (282). Lore does not realize that, in order to accept herself and her past, she must acknowledge that all three identities form one, true identity in which they are all included. She does not realize this yet, and her identity therefore remains unstable.

Spanner too deals with repressed trauma which causes her to act in ways that are not beneficial to herself. The suicide of Spanner's mother, as well as Spanner coming to the realization that her mother often lied to her, caused her to feel betrayed and abandoned, leading to her becoming a lone wolf. Spanner only once speaks about this childhood trauma to Lore, saying "it was then I realized that everyone lies. About everything" (117). Spanner's fear of intimacy as well as her low self-esteem cause her relationship with Lore to be strained and distant. Spanner's pain forces her to keep Lore at an extreme distance, and because Lore is her only true companion, Spanner lashes out at her whenever she is feeling sad or frustrated. Lore and Spanner are more similar than Lore believes, especially in the way that they have both experienced the suicide of someone close to them and their damaged relationships with their mothers. But, because neither has confronted these issues, they are unable to connect through these similarities or help each other heal. Lore also reflects on Spanner and Stella's similarities, and their "loneliness--no, their *emptiness*" which causes them to distance themselves from others (94). Furthermore, Lore and Spanner both have unresolved conflicts as well as personal issues, and this creates a toxic relationship. Each of these women creates a version of the other they want her to live up to, one that would allow them to relive their repressed

trauma while never actively dealing with it. Because of this dynamic, the relationship does not work out, and Lore is able to face her issues only after she and Spanner separate. Before she leaves, Lore tries to get Spanner to start this new life with her, and tries to convince her that there is a better life to live. Spanner always refuses, and believes that the low life she leads is what she deserves, and the only place she belongs (332).

Lore's sister Stella also faces unresolved conflict, dealing with much of the same abuse and dysfunction that Lore does. Stella, who faced much more frequent abuse from Katerine than Lore, must deal with an ignorant and confused father in addition to her abusive mother. Stella must remain extremely distant from the family in order to keep herself safe and somewhat sane, which leaves her feeling lost and alone. In keeping this distance from her family, Stella unconsciously keeps her trauma repressed. She constantly travels, never remaining close to them for very long. Stella also develops a seriously unstable sense of self, and because of the lack of relationship with her family, is unable to form mature adult relationships. The constant changing of her hair color represents the instability of her identity. Throughout the novel, Stella's hair is an array of colors (yellow, purple, black) and young Lore often wonders at this, asking herself how Stella could ever know who she is, if she always looks different (52). Unconscious of these conflicts, Stella travels from one country to the next, never giving herself enough time to feel safe or secure. Her relationship with her friends is mostly superficial, including a silly competition among the elite to see who can give away the most wealth. The narrator never reveals who Stella's friends are or even their names, showcasing her emotional distance even from them. Even though Stella was constantly running, she never could face her trauma and therefore could never escape it, and eventually she kills herself. Lore reflects that she "escaped by dying," never able to face her issues while living (293).

Greta is the oldest, and therefore the sister who likely suffered the most abuse from Katerine. Greta also has some of the core issues previously discussed, some which remove her so distantly from the family that she feels no remorse in making Lore the victim in order to get what she wants. Greta also suffers from an unstable sense of self, or really, no true sense of self at all. Any sense of self she has is rooted in the company. In order to keep her trauma repressed, Greta has created an image of herself that is completely separate from the family, yet totally absorbed by the family company. This is the only way young Greta could get away from Katerine in a major way. While Stella keeps herself going by drinking and traveling, Greta makes herself numb. Lore notices this about Greta from a young age, describing her as "gray," with "a gray kind of attitude to life" (67). Lore even admits that she thinks of Greta as more of an aunt than a sister,

because “Greta, even when she’s around, seems so distant, withdrawn” (67). This numbness and distance, gradually built up during several years of abuse from Katerine, allows her to hurt Lore so deeply while feeling nothing. This is Greta’s way of dealing with her trauma, and remaining numb allows her to keep the trauma unresolved and repressed.

Greta acted in the name of the company, and was able to cause pain and commit crimes because of her practiced numbness; but, Lore reasons, Greta, while still involved in her mother’s company, also “would need to feel powerful” (317). Katerine made Greta feel worthless and powerless, like an object. In order to run her abuser’s company, Greta had to feel powerful in some way again. To do this, she reactivated Jerome’s Boys, taking the future of the company and its affairs into her own hands. She committed crimes and abused others; she ordered the kidnapping of Lore and kept the ransom, causing both Lore and the rest of the family psychological pain. She did this in order to feel the power that was stolen from her, and in this way repressed her trauma completely.

Katerine is ultimately the reason for these girls’ wounds, but, Lore and Magyar conclude, the abuse they faced is no justifiable reason to continue to abuse others, as Greta did. Katerine, like her daughters, has an unstable sense of self; her only identity is her status as an executive in the company (she never speaks about motherhood and talks to the girls only about business or water treatment systems), and her constant competition with her husband, Oster. Katerine feels valid only when doing big business for the company or making Oster feel inferior. This instability causes Katerine to be cold and manipulative, keeping her daughters at a cruel distance, yet coming to invade their space in the night when they are most vulnerable. Unstable on the inside, Katerine often focuses on outer presentation, keeping up appearances of both herself and the family. Once, Oster tells Lore, “She wanted you to have all the visible trappings of the rich and powerful” (52). Although Katerine is often occupied with keeping up appearances, ironically, Lore struggles to remember the color of her mother’s eyes. Because she is so invisible in Lore’s life, Lore never puts it together that Katerine is the one coming into her room at night. She much more readily believes that it is Oster, because he is more involved in Lore’s life, even though she did not have any concrete evidence that he was the abuser.

In the end, Lore is the only one who is able to truly face her trauma and recover from it. We see Lore, unlike the others, develop healthy habits and relationships toward the end of the novel. Lore leaves her life with Spanner, gets an honest job, and begins to pursue a romantic relationship with Magyar. This relationship, unlike the one with Spanner, is full of beauty and deep connection, and Magyar even helps Lore face her trauma (she is the one who points out that Katerine was the abuser) and regain a stable

sense of identity. Near the end of the novel, as their relationship blossoms, Lore says her own name aloud, and thinks “I knew who I was. Lore. And when I forgot or became confused, Magyar would know” (320). Lore and Spanner never had such a connection, and Spanner often made Lore feel ashamed or confused about her identity, rather than more secure like Magyar. Pia Møller expands on this idea when she writes that “the fact that Lore engages in a relationship with the sympathetic Magyar indicates her increasing *sexual* and *emotional* agency” and notes the contrast between this relationship and the one with Spanner, which was “characterized by exploitation and coercion” (Møller 147). Lore’s ability to face her trauma and develop a mature sexual relationship are evidence of her growth.

Finally, Lore is able to see her three separate identities converge into one cohesive and inclusive sense of self. With Magyar’s help, she is finally able to process her past, which helps her understand her present and prepare her for her future. Unfortunately, the same is not true for Stella and Greta, or even Spanner. Each of these characters’ conflicts remain unresolved and nothing changes for them, or they meet tragic ends. The only escape Stella finds is in suicide. Greta remains a shell of a person and is presumably forced to resign from her position in the company. The book ends with Spanner still believing she deserves nothing more than the life she currently leads. Lore reflects on the unresolved issues in the lives of these three toward the end of the novel: “Stella had been a Van de Oest, and she had killed herself. Greta had been brought up as one, and she had twisted and stayed twisted. You had to allow change, you had to want it. You had to believe you deserved it. Spanner did not hate me; she hated herself” (Griffith 341). Lore recognizes that each of these characters were not as lucky as she and able to work through their core issues, but she concludes that that was due to the choices each of them made, and, ultimately, their attitudes towards themselves and their lives.

Overall, Lore, Stella, and Greta face deep personal issues which stem from their lives, their sense of self, and their anxieties. Stella and Greta are never able to confront their trauma, leading to Stella’s suicide and Greta’s complete disassociation from herself and her family. Lore’s former lover, Spanner, is also unable to confront her conflict and is never able to believe she deserves a good life. Lore’s mother, Katerine, is never able to find an identity outside the family business and manipulates her loved ones because of it. Lore, on the other hand, is eventually able to face her issues and resolve them. Lore struggles with repressed trauma and unstable identity throughout the story, but with the help of Magyar she is able to mentally sort everything out. Lore, unlike the others, is willing to show someone else vulnerability, which ultimately helps her resolve her issues. She is able to confront her trauma, her past, her family, and her anxieties. This allows

Lore to meld all of her experiences into one truly fluid and all-encompassing identity that she is proud of. Although Lore had been hurt in the past, she allowed herself to be open to others, which ultimately set her apart from her sisters and allowed her to move on to a better life.

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Changes in Sino-British Relations from the Opium Wars to the Taiping Rebellion

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Britain and China differed culturally and ideologically in the mid-19th century. The different perspectives on politics and trade caused tensions to rise between the two nations. China was previously an isolated nation that used Confucius beliefs to create their social and political structure. Britain wanted to interact with China to gain access to certain goods, like silk, tea, and porcelain. To do so they initiated trade with China at, Guangzhou, the Port of Canton. This was the only sanctioned trading port in China since the Chinese were wary of foreigners. The differences between the two nations reached its climax prior to The First Opium War, which began in 1839 and lasted until 1842. Following this, China would become a weaker nation due to the “unequal treaties” placed on them by Britain and America. One stipulation China had to follow in the “unequal treaties” was to cede Hong Kong to the British. This led to Hong Kong becoming an economic center vital to Eastern trade. Hong Kong also adopted certain principles from the British, like capitalism, which changed their identity. The “unequal treaties,” an agreement made between Western nations and China, would also play a role in starting The Second Opium War, also known as the Arrow War of 1856-1860. The British wanted to show their dominance in the region since they were an imperialist nation.

In terms of religion, British Protestant missionaries played a role in the increasing tensions between the British and the Chinese, because when opium was smuggled into China, British Protestant missionaries also smuggled in Bibles. This led a-Fa Liang to be exposed to the works of missionaries and later became the first Chinese Protestant missionary.² He wrote a manuscript of the teachings he learned; the first version was destroyed by the Chinese government because China used Confucius beliefs in their bureaucratic system. To become a member of the elite class one must take a civil service examination, *Jingshi*, which was based on Confucian texts; the direct translation of *Jingshi* is statecraft. Statecraft is the management of Chinese state affairs. The Taiping Rebellion of 1850-1864 was founded on Christian beliefs because of the

¹ Written under the direction of Dr. Alison Smith in partial fulfillment of the Senior and Honors Program requirements.

² In Chinese culture names are written as (last name, first) name so they have been modified to reflect (first name, last name) for the purpose of this paper.

dissatisfaction of the farmers, miners, and laborers with the social structure. One of the goals of the rebellion was originally to educate others on the work of God, while another goal was to break down the bureaucratic structure in place. This would lead to one of the bloodiest civil wars in history, approximately 30 million would die by the end of the war. The significance of this war stems from the earlier interactions between the British and the Chinese which would also influence the current events in Hong Kong today.

In accordance to Chinese thought, societal unity can remain throughout times of war with an importance placed on upholding tradition and respecting the past, which was stronger than going to war. The influence of imperialism and capitalism from the British would lead to a shift in Chinese culture through the Taiping Rebellion. These differences are conveyed through the events of the First Opium War, the Arrow War, and the current events in Hong Kong today. This is also observed through the introduction of Liang's notes on his conversion from Confucianism to Christianity, which influenced Xiuquan Hong's perception of Chinese society.³ The introduction of missionaries emphasized the cultural differences between the two nations which would ultimately create dissonance once the war ended and Britain gained Hong Kong as a colony. The introduction of Western and capitalist ideals combined with Protestant and Whig ethics culminated in the Taiping Rebellion.

It was difficult to find primary sources discussing the Opium War and the Taiping Rebellion since the Qing Dynasty destroyed a majority of the material. This is partially because most materials written by the Taiping—people involved in the rebellion against the Qing Dynasty—were destroyed following the rebellion. Some sources that were discovered, have issues with their translations or the initial meanings were lost or misunderstood. This occurred with the manuscript by a-Fa Liang—some sources say his name is “Lin a-Fa” while others refer to him as Liang. This caused some confusion since it led to discrepancies of whether this was the same person or if the translation was reputable. This was found in different works especially when searching for verification of the author's names and checking for consistency in sources. The lack of original documents made it difficult to search for and find primary sources. Another issue encountered was that most of the documentation came from the British archives and accounts so some of the material is biased.⁴

³ Throughout this paper I will refer to him as Xiuquan Hong because he is also referred to as Hung Hsiu-chu'uan in other sources.

⁴ William Theodore De Bary et al., *Sources of Chinese Tradition: From 1600 through the Twentieth Century*, 2nd ed., *Introduction to Asian Civilization* (Columbia University Press, 1999), p. 170.

To understand the differences between the East and West a close examination of the early interactions between China and Britain is necessary. In the early 1800s, China was an isolated nation that valued their economic and material self-sufficiency. A pivotal moment in Chinese society took place during the Warring States period, in 475 BCE to 221 BCE, when the different Chinese provinces fought against each other for control of the region. At this time, the feuding Chinese provinces were conquered to form one Chinese Kingdom under the unification of one dynasty. Bureaucratic and philosophical changes also occurred during this period based on input from philosophical thinkers. One of the most prominent thinkers during the Warring States period was Confucius. Confucius focused on intellectual cultivation in the lens of status, class, and hierarchy in society. Once interactions with the British increased in the nineteenth century, Chinese historians focused on following their traditional values including writing about the past as dictating the events of the year instead of as a narrative, which was prominent in Western society. One example used throughout Confucius' work is the Chinese imperial system; this system relied on Confucius concepts, which established the Tang Code between 618-906 CE and implemented by the Tang Dynasty. The Tang Dynasty created a History Bureau to record events that occurred during their time in power. Throughout this time, history-writing dictated political functions. The use of Confucian concepts such as *Yi*, an aspect of Confucianism that encompassed a sense of righteousness and justice, to justify why certain dynasties lost favor with *Tian*, the God of Heaven is relevant to understand their cultural identity in the new social order. This is observed in the traditional Chinese judicial system and the regulation of domestic ideas and traditional values in the mid-1800s.

The Chinese judicial system was best expressed through Confucius ideals and beliefs, as well as a lack of the Western concept of nationalism since there was an emphasis on familial ties rather than the individual. The concept of putting the individual first was prominent in Western nations at this time. The Chinese judicial system was implemented in the Tang Dynasty in 624 CE. The Tang code used “Confucianisation” to represent societal views and law codes since the fundamental aspects of the religion were deemed important by the dynasty. In turn, having a foundation in Confucian values led to the lack of enforcement in the judicial system and reliance on law to maintain societal structures.⁵ When the Manchus, a group of nomadic tribes from Manchuria who then travelled towards China, conquered the Ming Dynasty in 1636; they established the Qing Dynasty—the last dynasty of imperial China.⁶ The Qing government continued the

⁵ De Bary et al., *Sources of Chinese Tradition*, p. 170.

⁶ Francis K. Aldred, “China’s Struggle to Break with its Past the Adoption of Western

practice of *Yi* and the Tang Code from the Ming Dynasty in the form of requiring Confucian ideals. According to this belief, the state should not be involved in the lives of commoners since they would carry out societal functions individually. This relates to the implementation of *Liji*, the Confucian Code of Rites, which became the sole doctrine dictating social order and action in 1644. This is important because there was an increased focus on collectivism, doing one's part to maintain the whole structure and order. The magistrate could make decisions based on the situation by interviewing commoners without a public hearing; this is an example of not disturbing the social order throughout the Qing Dynasty.

According to the statute of *Liji*, the law can only be applied to those whose actions go against social norms. The district magistrate of China would investigate the crime by utilizing society to create acceptable boundaries.⁷ Magistrates during the Qing Dynasty would also function as scholars by cultivating Confucian ideas in the form of moral training and knowledge of Confucian literature, which influenced Chinese historiography—studying the writings of history. In China, there was an emphasis on morality and the importance of lessons. The bureaucratic officials of the Qing Dynasty created a school of “evidential scholars”, which tended to be those who took the test to become magistrates. “Evidential scholars” would analyze and evaluate historical sources on the basis of tying them back to Confucian tradition.⁸ This led to the creation of Neo-Confucianism, the philosophical application of the religious beliefs, which is referenced in the fundamental aspects created in the Tang Code that were elaborated on when the Qing Dynasty came to power.⁹

Yuan Wei was an “evidential scholar” loyal to the Qing Dynasty. He created the concept of *Jingshi* and substantive learning to analyze the development of the Qing Dynasty. *Jingshi* is based on Neo-Confucian beliefs like self-cultivation, governance, human agency, practical affairs, and objectivity.¹⁰ The purpose of understanding the state stems from knowledge about the self and human agency—a sociological principle detailing engagement within a set social structure.¹¹ According to Wei, “laws and

Ideas in the 19th and 20th Century,” *The Journal of the West Virginia Historical Association*, vol 10, issue 1, (1986), p. 1-3.

⁷ De Bary et al., p. 172-173.

⁸ Jeremy Popkin, *From Herodotus to H-Net: The Story of Historiography*, (Oxford University Press, 2016), p. 35

⁹ De Barry, et al., p. 176.

¹⁰De Bary et al., p. 185.

¹¹ De Bary et al., p. 202.

systems are based on human agency” which are influenced by past historical events.¹² An example of this is observed through the Qing Dynasty’s implementation of *Jingshi* through a civil service examination to become a member of the upper class. Jobs became available to scholars to dictate the importance of the Empire in relation to the West; since this occurred scholars were part of the elites in Qing society. This is important to note because it represented the rewriting of Chinese history in their favor. Wei attempted to connect the Qing Dynasty to the bigger world context which was dominated by European influences.

One of the fundamental principles of Neo-Confucianism focuses on self-actualization, *Li*, in relation to the God of Heaven, *Tian*; it is said to represent the relationship between humanity and a greater being in hopes of becoming one with Heaven. To encounter self-actualization, one must reflect on one’s role in the family and one’s role in society. This relates to *filial piety*, a child’s relationship with their parents and ancestors. The hierarchy created by *filial piety* led to a stronger connection to the family and a lack of nationality. This virtue also placed an emphasis on embracing Chinese culture by specifically focusing on opposing conflicts and war because there was no sense of fighting for one’s country.¹³ This is because Neo-Confucianism focused on ethics and morality in reference to social order and family responsibility.

Historians have called the period of Qing rule as the end of the Middle Kingdom in Chinese Foreign relations, because China was the economic and cultural center of the East at this time. By 1820, China’s gross domestic product (GDP) was roughly twenty percent of the world market; in comparison to Britain’s GDP, which was fifty percent of the world’s total economy.¹⁴ This is important because it represents how self-sufficient the Chinese economy was since they did not need to rely on Britain for goods. The Qing Dynasty implemented *chaogong tizhi*, the tribute system, because they believed they were superior to the British in regard to their economic prosperity. The Chinese were also wary of foreign traders since they tended to not partake in peaceful trade negotiations. In turn, this would destabilize Chinese society and lead to political unrest by promoting piracy and rebellion.¹⁵ This is also important to note because the British

¹² De Bary et al., p. 185.

¹³ William Sin, “Confucianism, Rule-Consequentialism, and the Demands of Filial Obligations,” *Journal of Religious Ethics*, vol 47, issue 2, p. 377-378.

¹⁴ “12 Facts on China’s Economic History,” *The Globalist*, November 10, 2014, <https://www.theglobalist.com/12-facts-on-chinas-economic-history/>.

¹⁵ Wolfgang Keller, Ben Li, and Carol H. Shiue. “China’s Foreign Trade: Perspectives from the Past 150 Years,” *The World Economy*, (2011), p. 858.

considered the tribute system, a highly regulated trade system in China, to be archaic even though China was self-sufficient, and their GDP was a substantial amount of the world economy.

The Chinese implemented the tribute system to monitor interactions between the East and the West in 1638 when the Manchus conquered the Ming. The system created a sanctioned trading post at Canton, China, between Hong merchants and foreigners.¹⁶ Hong merchants were members of the trade monopoly in Canton during the Qing Dynasty. This monopoly was the only exchange between the Chinese and the British; trade was closely examined by the Qing government since they were wary of foreigners. The Guild of Hong merchants was sanctioned to handle trade via an imperial edict created by the Qianlong Emperor in 1760. This system was deeply rooted in Neo-Confucian ideology since it follows the “Confucian World Order,” the idea that the Chinese hierarchy is rooted in a Confucian social order portrayed by the belief that humans are unequal in their moral standing.¹⁷ The tribute system is similar in principle to that of the anthropological gift exchange, where goods are exchanged to reinforce social and moral behaviors and social hierarchies. Those who participated in the tribute system would have to pay respect to a superior by giving them material goods. In turn, the superior would reward the giver with a higher status or backing in regard to familial disagreements.¹⁸ This resembles the gift exchange since it is a form of status reinforcement that is an endless cycle. This is significant because the Qing Dynasty expected the British to pay tribute to them in the form of silver because the Qing believed they were “superior” to the British.¹⁹

Britain had struggled to find which British goods would sell well in China because of China’s background as an isolated and self-sustaining country that claimed that they did not need outside goods. The British government under King George III placed emphasis on the prosperity and security of trade with China and the effects of free trade.²⁰ Through this trade, Britain gained numerous goods like silk, porcelain, and tea.

¹⁶ See Appendix A, Figure 1.1

¹⁷ Hao Gao, “Going to War Against the Middle Kingdom? Continuity and Change in British Attitudes towards Qing China (1793–1840)” *The Journal of Imperial and Commonwealth History*, (2017), Vol 45, no 2, p. 210-212.

¹⁸ Paul Cohen, “Changes Over Time in Qing History: The Importance of Context,” *Late Imperial China*, Vol. 37, No. 1 (June 2016): p. 10.

¹⁹ Cohen, p. 10.

²⁰ Hao Gao, “Understanding the Chinese: British Merchants on the China Trade in the Early 1830s,” *Britain and the World*, vol. 12.2 (2019), p. 160.

British traders started to form relationships with unsanctioned Chinese merchants that was later referred to as a form of “unauthorized trade.”²¹ This was established following the Thirty Years War, which happened from 1618-1648. This system focused on “sovereign equality and autonomy.”²² Originally, China demanded silver in exchange for the goods provided but this was difficult for the British to obtain because they were outsourcing the material from Africa and South America. Due to an increased demand for Chinese silk, tea, and porcelain in the British market, the British attempted to find an alternative good to replace silver to trade with China since trade between Britain and China led to Britain incurring large amounts of debt.

In Britain, free trade was influenced by Christian reforms through the Government of India Act in 1833, and the First Opium War from 1839 to 1842. *The Government of India Act* extended the charter for the British-East India Company (BEIC) for another twenty years; prior to this, the BEIC was a commercial body that was considered a monopoly through the trade it had with China. After this act, the BEIC became an administrative body. The abolition of the monopoly and regulations on opium led to the smuggling of opium to increase by almost tenfold. The Whig Party, the leading party in Britain, believed that a country like China who blocked free trade was not just exercising sovereignty but was undermining modernization. This party thought that the imposed regulations from the Qing Dynasty were taking away from British laborers earning silver. The Whig Party also believed that Chinese traditions went against the concept of free trade since Confucianism placed values on familial ties instead of on self-advancement.²³

To rectify this, a commodity grown in the British colony of India, known as opium, would be a sufficient item to trade. The BEIC gained profits from growing poppies and turning them into opium to sell. Opium was dried sap obtained from the seeds of the opium poppy. It was used recreationally by mixing it with tobacco for smoking or it was taken orally. The drug’s effects were stronger when smoked and it was highly addictive. The British knew that the drug was addictive, so they banned the smoking of opium in Britain under the rule of King George III in the 1600’s. The British

²¹ Gao, “Understanding the Chinese,” p. 160.

²² Yuan-kang Wang, “Explaining the Tribute System: Power, Confucianism, and War in Medieval East Asia,” *Journal of East Asian Studies*, no 13 (2013), p. 207.

²³ Colin Sargent. “The Big Loaf and the First Opium War: Capitalism and Domestic Policies in the British Empire 1813-1846, Special Forum: Proceedings from North Eastern University’s 2012 Graduate Student World History Conference on Empires and Technologies in World History”, *The Middle Ground Journal*, no. 1, 2014, p. 5.

then pushed for the trading of opium in lieu of silver because of its highly addictive nature.²⁴

Emperor Qianlong and King George III exchanged letters because of the increased influx of opium imports in China. The letters show their respective biases towards the tribute system. Emperor Qianlong's letter to King George III is significant since it represents the traditional mentality the Emperor had. In his letter, Emperor Qianlong goes into detail discussing how Europeans who remained in China can do so and they should adopt traditional Chinese customs and ideals. The Emperor shows his dismay over the King's belief that dynastic regulations would be modified to allow for trade to continue in the East. Prior to this letter, King George III sent Emperor Qianlong gifts to support their partnership since China was not accepting European trade. Emperor Qianlong also mentions that there were a multitude of different countries in Europe so he believes that submission to England would influence the peace and prosperity of China. According to the Emperor, the demands presented by King George III "are not only a contravention of dynastic tradition but would be utterly unproductive..."²⁵ This quote is significant since it represents the different cultural perspectives of China and Britain. China embraced its more dynastic and traditional societal roles while Europeans viewed China as a backward nation that was not modernizing. Historians view this as a cultural difference that would eventually lead to increased tensions leading up to the First Opium War.

Since the 1960s, historians have viewed the introduction of Western ideals in China as an essential aspect of their historical identity. John K. Fairbank was one of the first historians to examine the relationship between the Chinese and the British.²⁶ He based his analysis on Western and Chinese sources. A majority of his sources came from the Washington Department of State archives, the customs archives from Shanghai, and the British Consular archives.²⁷ According to Fairbank, the First Opium War occurred because of strong cultural differences between the East and the West. Fairbank's

²⁴ Alain Peyrefitte, *The Immobile Empire—The first great collision of East and West—the astonishing history of Britain's grand, ill-fated expedition to open China to Western Trade, 1792-1794*, (New York: Alfred A. Knopf, 1992), p. 520-545.

²⁵ E. Backhouse and J.P.P. Bland, "Emperor Qianlong's 'Mandates,'" *Annals and Memoirs of the Court of Peking*, p. 323.

²⁶ John K. Fairbank, *Trade and Diplomacy on the China Coast: The Opening of the Treaty Ports, 1842-1854*. (Cambridge, Massachusetts: Harvard University Press) 1953, p. 1-3.

²⁷ Gao, "Understanding the Chinese," p. 163.

research found China to be a conservative nation that was tentative to opening its borders to foreign nations. In turn, the British were a progressive nation pushing for capitalism based on Whig ideals, like supporting the merchant class.²⁸ The British were concerned with the rising tensions between Chinese Commissioners, who were opposed to, and attempted to stop the opium trade and British traders. British traders began trading opium with Hong merchants in 1757 undermining the regulations the Chinese put in place.²⁹

The system led to increased tensions within China since the government was unable to regulate trade because it exceeded the use of the Hong merchants—merchants sanctioned by the Qing government to trade with foreigners at the port of Canton.³⁰ Britain's need to reform and end the tribute system and instill free trade was a driving force for the First Opium War. The Whig Party in Britain focused on the concept of free trade, international exchanges without tariffs and other economic sanctions. This idea differed from the traditional Chinese view since the British believed they blocked free trade as a means of exercising sovereignty, which undermined modernization and expansionism.³¹ Therefore, the British thought that Chinese traditions and policies went against the concept of free trade, which was another factor that ultimately led to the First and Second Opium War between Britain and China.

The Whig Party in Britain began in 1680 and continued to be prominent until 1850. They were the dominant party until King George III's reign in 1760 when the Tories regained power. The Whigs then regained control during the reign of Queen Victoria in 1837. Their focus lay in supporting aristocratic families as well as Protestants since they had a similar goal in expanding industry to other countries. A major component of Whig ideas was held in the push for industrial growth. This is because the Whig party gained support from the mercantile class. Since a majority of Whig supporters were traders, there was a push by the party to increase capitalist interactions with other countries like China. This is relevant to understand the introduction of Whig thought in China. The Whigs attempted to introduce the concept of personal freedom, which is different from the Chinese value of the family and collectivism. Another

²⁸ Capitalism was called free trade by the Whigs. For the sake of consistency, I will refer to free trade as Capitalism throughout the paper.

²⁹ Fairbank, p. 5-9.

³⁰ Zexu Lin. "Commissioner Lin's Letter," *International Relations of the Chinese Empire*, vol 1, (Shanghai 1910), p. 137.

³¹ Dilip K. Basu, "The Opium War and the Opening of China: A Historiographical Note," *Ch'ing-shih wen-t'i*, Volume 3, Supplement 1, (1997), p. 5.

important component of Whig thought was the move towards progress for the Enlightenment of others. This is significant because there was now a focus on human reason influencing society regardless of past events.³² Chinese historiography tended to document past events as a means of understanding and recording what occurred.³³ It was not recorded with an in-depth analysis of the events, instead, Chinese historiography was a list of recorded events, like battles and trade routes, that referenced an important part of their history.

Fairbank believed the British East India Company (BEIC) played an essential role in trade issues between China and Britain. The BEIC was a monopoly that pushed for expanded trade in China even though the Chinese government wanted to isolate trade to one location in Canton. In the eighteenth century, Chinese commerce with the BEIC for opium made up almost two-thirds of the trade with the West in Canton. Fairbank states that the interactions between the two nations became tense following the Governor of Hong Kong's push to use force against China to show that Britain had more power. Fairbank also analyzes class struggle in China as a means of the implementation of Confucian ideology. He cites the Neo-Confucian political, social, and economic order as a means of influencing the negative attitudes the Chinese had towards the British. Chinese scholars during this dynasty began to argue and justify certain claims to analyze past events in relation to recent complications. The imperial system was modified to include the Foreign Inspectorate of Customs, a group of Chinese officials that oversaw trade, which was established during the Qing Dynasty. By 1858, the Foreign Inspectorate of Customs oversaw all treaty ports.³⁴

Fairbank also states that the creation of the Foreign Inspectorate of Customs was one of the essential points that led to the push of Western imperialism in China because it was based on a hierarchical system. Hong merchants were at the bottom of the social order and were considered to be of low rank compared to scholars and civil servants who were members of *Jingshi*.³⁵ Within the social class structure, the hierarchy created was based on the need to become a gentry-scholar and become a civil servant. This is significant because the civil service examination, *Jingshi* affected the social class structure by pitting the gentry-scholars against the agricultural peasants. The differences

³² Geoffrey Holmes, and Szechi, D., *The Age of Oligarchy: Pre-Industrial Britain 1722–1783*, (Routledge: 2014), p. xi.

³³ Popkin, p. 35.

³⁴ Fairbank, p. 12-13.

³⁵ Fairbank, p. 16-17.

between those who were members of *Jingshi*, civil servants, and those who were peasants relied mostly on their exposure to Western concepts and ideals. Hongmou Chen, a Chinese scholar and Qing official created the concept of *Jingshi* in regard to the idea of substantive learning—the critical analysis of philosophical, historical, and literary texts in regard to Confucian ideals. Chen’s analysis focused on political-economic problems since the Qing Empire was rapidly growing in these areas. He wrote a series of letters to other Chinese intellectuals, following the Warring States period, discussing the importance of statecraft and the necessity of remaining an isolationist nation.³⁶ Fairbank states that peasant society centered heavily on *filial piety* and other Confucius values, while Chinese scholars relied heavily on Confucian texts to justify the tribute system.³⁷ Fairbank does not go into further detail of what effects trade had on the two nations since he focused more on cultural interactions.

Fairbank’s explanation of the causes for the Opium War differed from Professor Chung Tan, University of Delhi India. In the 1970s, Tan debates the significance of Fairbank’s claim that the war was caused by differing cultural ideologies. He states that Fairbank “provided the occasion rather than the sole cause of the war.”³⁸ This means that Fairbank is looking more at the conditions surrounding the war, while Tan is looking at the root causes of the war. Tan’s main argument was that the clash of socio-economic interests around the opium question was the primary cause of the First Anglo-Chinese War. According to Tan, the Opium War was fought to restructure the Chinese economic and social system so it would reflect the British systems that were in place. He critiqued Fairbank’s argument about the tribute system as stereotyping the foreign merchants as those who were against Chinese traditions in relation to economic gain. He claimed that Fairbank uses “Sino-centrism,” which refers to the ideology that China is the cultural, political or economic center of the world, to justify the start of the war by labelling this period as China’s Middle Kingdom. His main argument revolves around George Macartney’s, a British diplomat, visit to China to speak with the Emperor in 1794. Since Macartney refused *kowtow*, paying respect by kneeling down on the floor and bowing by touching your head to the floor three times, he never received an audience with the Emperor. According to Fairbank, if Macartney had been able to meet with the Emperor to discuss trade conditions and terms, the Opium War may not have occurred.³⁹ Tan

³⁶ De Bary et al., p. 184–86.

³⁷ Fairbank, p. 16-17.

³⁸ Tan Chung, *China and The Brave New World: A Study of The Origins of The Opium War (1840-42)*, (Carolina Academic Press) p. 5-9.

³⁹ Chung, p. 52-63.

believed that the Macartney Embassy was indeed a factor that contributed to the war, but he insisted that it did not play a major role in the impending conflict.

The causes of the Opium Wars were re-examined again in 2017 when Professor Hao Gao, University of Exeter in the United Kingdom, reevaluated the subject.⁴⁰ He utilized many of the same sources Fairbank and Chung used since he also critiques their arguments. Gao stated that the concepts introduced by Fairbank and Chung were only surface-level understandings that did not go in-depth on the actual causes of the war. He scrutinized British attitudes towards the Chinese based on Sino-British encounters before and during the opium trade. He also looked at the differing cultural representations and policies they provided in China throughout this time and how they related to the outbreak of war.⁴¹ Gao argues that the political acceptance of China occurred because political actors, like Commissioner Zexu Lin and Macartney, influenced a shift in attitudes the British held towards the governmental institutions of the Qing Dynasty in China. He further states that there is a lack of evidence as to the exact reasons why Britain decided to engage in war against China. He states that this could be because of the shift from amicable to tense relations. Gao states that to understand the causes of the war, it is necessary to examine the period before it. Under these circumstances, he claims that the Macartney Embassy from 1793-1794, the Amherst Embassy from 1816-1817, the Napier incident of 1834, and the opium trade from 1839-1840, led to a shift in Chinese ideology.⁴²

In 1794, the Macartney Embassy was the first British diplomatic mission to China. The mission was meant to focus on opening new ports for trade between Britain and China, to establish a permanent embassy in Beijing, and to reduce trade restrictions between British and Hong merchants at Canton. Despite the push by the British to increase trade negotiations, the mission is considered to have failed because they could not come to an agreement. Even though this occurred, Macartney stated in his diary that: “our present interests, our reason, and our humanity equally forbid the thoughts of any offensive measures with regard to the Chinese, whilst a ray of hope remains for succeeding by gentle ones.”⁴³ This is significant to note because Macartney believed that it was necessary to preserve the current state of economic trade in China if Britain wanted

⁴⁰ I had email correspondence with Professor Gao discussing primary source material. He also provided specific sections of his research I could look into for my historiographical analysis. I would like to thank him for his input.

⁴¹ Gao, “Going to War Against the Middle Kingdom?” p. 210-212.

⁴² Gao, “Going to War Against the Middle Kingdom?” p. 213-218.

⁴³ Gao, “Going to War Against the Middle Kingdom?” p. 219-223.

to gain lucrative assets; it would be important to avoid war since China did not have the necessary assets to hold their own against Britain.

Twenty-two years later, William Amherst was sent to China to establish a new embassy. After the Macartney Embassy failed the hope was to establish a better, more secure, and equal trade protection for the two countries. Amherst stated in a letter to the King that the Qing Emperor was not agreeable in terms of his treatment and expectations of the British. He did not participate in *kowtow* because he felt that the British had been treated unfairly by the Emperor. This negative experience caused the travelers of the Amherst mission to suggest that Britain should adopt a firm stance against the trade regulations put in place by the Chinese. Gao claims that following the Amherst mission there were increased tensions between Britain and China due to the uneasiness and lack of trust, which was observed through the introduction of opium to China even though it was banned by the Qing Emperor. These tensions increased in the 1830s and would lead to a conflict between Britain and China.⁴⁴

According to an anonymous British merchant's experience with the opium trade in China, the exchange of opium went against the laws of the Chinese empire. His account was written in approximately 1830. Even though the British considered opium poison, the British merchant believed that the laws set forth by the empire contradicted the need for international trade and reciprocity. The British merchant viewed the Chinese government's attempt to stop the opium trade as an injustice to the process of international trade. He mentioned "the people in the Western world poison themselves with wine...the Chinese should be poisoned with opium." This is significant because the British viewed the Chinese as a subservient community that was full of prejudice since they denounced the wholesale trade of opium within their borders.⁴⁵

This supports a firsthand account by an American merchant in Canton. The American merchant explains that the opium trade was a moral issue. The American merchant referenced the Chinese as "healthy, active, hard-working, and industrious people."⁴⁶ This tends to contradict the personification of the Chinese since Europeans believe they are addicted to opium. Those who smoke habitually do not share the traits the American merchant used to describe the merchants in Canton. The American merchant also states that he has lived in "Canton, Macao, and Hong Kong" for forty years and the use of smoking opium was not present throughout these cities up to the end of the first Opium War.⁴⁷

⁴⁴ Gao, "Going to War Against the Middle Kingdom?" p. 223-225.

⁴⁵ "A British Merchant's Answer," *The Chinese Repository*, Vol V, p. 407-412.

⁴⁶ "A British Merchant's Answer," p 409.

These two merchants differed in their understanding of Chinese culture based on their own experiences with trade. The British merchant's perspective stems from the Whig concept of free trade and that the Chinese were going against this principle. Through British and Chinese interactions, it can also be noted that the British looked down on the Chinese because of the negative interactions they experienced. This differs from the experience of the American merchant because America and China did not have negative trade interactions prior to the First Opium War. The first interaction between the Chinese and the Americans occurred in 1783, when American sailors came to China to get access to tea. They arrived on the ship, *The Empress of China*. Originally the Chinese traders at the Port of Canton were skeptical about the trade; later on, the Chinese did not perceive the Americans as a threat since they were on more equal footing during trade negotiations.⁴⁸ The varying perception and difference in attitudes is portrayed through the different accounts by the merchants.

In 1811, Zexu Lin, a scholar of *Jingshi*, was appointed to a post in fiscal matters and public works in Canton, China.⁴⁹ Because of his background in statecraft and a strong desire to eradicate the opium trade, he was promoted to Commissioner in the 1830s when opium smuggling was at its peak. His first actions were against the Hong merchants and Western traders—all crates of opium at the Port of Canton were subsequently destroyed. During this time, Commissioner Lin wrote a letter to Queen Victoria of England discussing his concerns over the opium trade and the present urgency for it to cease.⁵⁰

Written in 1838, the letter detailed the hardships the Chinese encountered from trade with Britain. He called the British merchants “barbarians” and “hypocrites” since smoking of opium was illegal in England yet when the Chinese wanted to ban opium it became an ethical problem for the British.⁵¹ Commissioner Lin believed that Britain was only doing this for their own economic gain. According to the Commissioner, the smoking of opium was banned in Britain which went against the push for Opium consumption in China. He believed that if China were to cut off trade with countries like

⁴⁷ W.C. Hunter, *The Fan Kwae at Canton Before Treaty Days: 1825-1844*, Shanghai, 1911, p 79-80.

⁴⁸ Robert G. Sutter, *U.S.-Chinese Relations: Perilous Past, Pragmatic Present*, (Lanham, Maryland, Rowman and Littlefield Publications Inc.: 2010), p. 32.

⁴⁹ See Appendix A, Figure 1.2

⁵⁰ Lee, Ji-Young (2017), *China's Hegemony: Four Hundred Years of East Asian Domination*, Columbia University Press, p. 187.

⁵¹ Zexu Lin, “Commissioner Lin’s Letter,” *International Relations of the Chinese Empire*, vol 1, (Shanghai 1910), p. 139.

Britain, China would not suffer because of their prior isolationist nature. Instead, Britain would suffer since they would lose access to products like silk. He goes even further to state that a triple profit can occur because Chinese products can be sold to Britain and later sold to other countries for consumption and use so Britain's economy would flourish by trading opium with China. The rhetorical question, "if the barbarians do not bring opium, then how can the Chinese people resell it, and how can they smoke it?", sums up the point Commissioner Lin is attempting to make because he believes the root of the problem stems from the trade itself.⁵² The Qing attempted to stop the sale of opium, so it was then smuggled in by the British and the Hong merchants to attempt to make a profit. As Commissioner of the region, he states that those who did not follow the rules would be sentenced to death. This is important since it would increase tensions between the two nations because Commissioner Lin claimed that those who partake in the opium trade would be penalized with death. Historians claim that this source was the catalyst for the beginning of the First Opium War. Instead, the document provides support for the implementation of the capitalist system and the push for Westernization since the British disagreed with the traditional aspects and dynastic relations provided. In turn, they viewed China as a weaker nation that should rely on international trade to survive. Commissioner Lin's policies were based on Neo-Confucius ideas like reciprocity that are present in the tribute system.⁵³ His actions and derogatory tone in the letter to Queen Victoria negatively influenced the tensions between Britain and China which would ultimately be the catalyst for the First Opium War.⁵⁴

The British Foreign Secretary, Lord Palmerston, sent a letter to Sir Henry Pottinger, who was a member of the British envoy in China. Palmerston was a British official who originally wanted to pacify China. Instead, the action of the destruction of the crates of opium gave him the incentive to go to war against China. He states that the Chinese government had banned the trade of opium and the punishment for trading the product would be death. In this instance, Lord Palmerston believed that the Chinese government was fully entitled to stop the trade but that the British should undermine the government's authority and continue to use the "unauthorized trade." His letter was shared with Baron Thomas Babington Macaulay, who served as the Secretary of War from 1839 to 1841. Macaulay was an important Whig thinker and his writings introduced Whig ideas to India. He discussed the push by the West to increase progress

⁵² "Commissioner Lin's Letter," p 139.

⁵³ Lin, p. 138-144.

⁵⁴ This is referenced in multiple sources I have examined for my argument.

in the form of industry, and to have missionaries spread their beliefs so conversion could occur. He believed that opium was an addictive substance that was damaging the Chinese states. Despite this, he argued that Commissioner Lin's letter was a form of intimidation that backfired.⁵⁵ Palmerston's letter to Macaulay is said by some historians to have influenced the decision to go to war against China.⁵⁶

On August 29, 1842, Queen Victoria and Emperor Qianlong signed *the Treaty of Nanjing*. *Article III of the Treaty of Nanjing* stated that the Island of Hong Kong was to be ceded to the British. Another stipulation of the treaty was that China would have to pay reparations and open up five treaty ports in addition to Canton.⁵⁷ According to the Treaty, the British would be able to reside in Hong Kong to continue their economic pursuits.⁵⁸ This treaty, among others, greatly weakened the Qing Dynasty's dominance in the East. America based *The Treaty of Wang-hea* on the *Treaty of Nanjing* in regard to sanctions placed on China.⁵⁹ *The Treaty of Wang-hea* was signed on July 3, 1844. It was negotiated by Caleb Cushing and Peter Parker from the United States, and also hindered the existing tribute system in Canton since the United States would be of equal status with Britain in terms of international trade. A clause of *The Treaty of Wang-hea* was that Chinese subjects would be held accountable for their actions under Chinese law, while American citizens would be held accountable by the American counsel in China. This also applied to the British because Britain was listed as a most favored nation (MFN). This meant that there would be equal trade advantages, such as lower tariffs and higher import quotas that Britain would receive.⁶⁰ These treaties became known as the "unequal treaties" since the Qing Dynasty was forced to sign them and agree to the terms set forth by Britain and America. The Qing Dynasty became weak and corrupt following China's

⁵⁵ Peter J. Kilson, "The Last War of the Romantics: De Quincey, Macaulay, the First Chinese Opium War," *The Wordsworth Circle* 49, no. 3 (Summer 2018), p. 148.

⁵⁶ S. Couling, "Lord Palmerston's Instructions to Sir Henry Pottinger respecting Opium, May 1841," *Encyclopedia Sinica*, London, 1917, p. 406.

⁵⁷ See Appendix A, Figure 1.3

⁵⁸ The Statistical Department of the Inspectorate General of Customs, "From the Treaty of Wang-hea" *China: Treaties, Conventions, Etc., Between China and Foreign States*, Vol 1 (2017), p. 351-356.

⁵⁹ Some sources refer to the Treaty of Wang-hea as Wagnxia and Wanghia. Throughout this paper I will be referring to the American Treaty as the Treaty of Wang-hea.

⁶⁰ The Statistical Department of the Inspectorate General of Customs, "The Most-Favored Nation Clause: Article VIII, Treaty of the Bogue," *China: Treaties, Conventions, Etc., Between China and Foreign States*, Vol 2, (2017), p. 393.

defeat at the hand of the British following the First Opium War. There was political unrest since the elite members of the Qing government had begun to lose their position in the social hierarchy. This was because domestic opposition to the old system emerged.

Western influence in Hong Kong increased during this period. Since Hong Kong was now a British colony, there was more exposure to Western concepts like capitalism. Hong Kong is approximately 6,000 miles from London; despite being a British Crown Colony, ninety eight percent of the population were Chinese.⁶¹ The presence of the British in Hong Kong influenced numerous factors of development. In the colony's early years there was a large influx of refugees who wanted to partake in the financial success Hong Kong was incurring. In this sense, the drive to increase income was similar to that of the West. This is because the focus lied in balancing life, making money, and enjoying spending it, which were basic capitalist principles. Through these principles Hong Kong became a world financial center.⁶² This is expressed through statistics detailing the percentage of increase of trade in the region.

Following the First Opium War in 1842, Sir Henry Pottinger was promoted to British Plenipotentiary. He was given jurisdiction over the colony of Hong Kong. Pottinger used Hong Kong to expand trade networks in the East. He claimed that China had the potential to increase stock prices for Britain because of its location and the opportunity for an influx of goods to trade. The volume of goods traded in Hong Kong increased drastically during this time since the colony was considered by historians to be the bridge between the East and the West. This is important to understand the relationship between Britain and Hong Kong based on the significance of trade relations. Larger countries were less likely to trade with China through Hong Kong, instead the region was favored by smaller countries that did not mind the exchange occurring through an intermediary. Between 1865 to 1900, on average 41.36 percent of imports and 26.94 percent of exports took place in Hong Kong. Compared to Great Britain, Hong Kong experienced more imports and less exports.⁶³ This is because the colony's role was to be an intermediary as part of the entrepot trade with China. Throughout this period, trade between China and Britain increased greatly because of the use of Hong Kong as a bridge between the two nations. From 1870 to 1950, Hong Kong was the entrepot for 50 percent of the trade of China's exports. The opium trade with China gradually decreased

⁶¹ Jan Morris, *Future Shock in Hong Kong*. (New York: Random House, 1987), p. 3-5.

⁶² Morris, p. 4.

⁶³ Wolfgang Keller, et al., "China's Foreign Trade," p. 870.

and abruptly stopped in 1910. This is because other goods like cotton became a more desirable commodity.⁶⁴

The Second Opium War, also known as The Arrow War, began in October 1856 when Qing officials boarded the Chinese owned ship the Arrow, which was registered as a British vessel. The ship was registered in Hong Kong with a British captain, so the Qing were suspicious of the crew. Part of this is because of the “unequal treaties” signed twelve years earlier. The American *Treaty of Wang-hea* contained a clause citing that it would be renegotiated after being in effect for twelve years. Since America and Britain were both of MFN status, Britain claimed that they should also have the opportunity to renegotiate *The Treaty of Nanjing*. Based on the MFN status, Britain demanded that all trading ports be opened to British merchant companies, that the opium trade is legalized, and piracy is suppressed. Under this treaty, Chinese merchant ships were then registered in Hong Kong as British merchant ships. In turn, Qing officials arrested most of the crew of the Arrow because they thought that it was a pirate ship based on the conditions of the *Treaty of Nanjing*. Since the ship was registered as a British ship, it was protected. Negotiations regarding the release of the crew became heated and led to an eventual war between China, Britain, France, Russia, and the United States. At this time the Qing were fighting the Taiping and the Western powers, so they ceded to the West since they did not have the resources to continue the battle.

Prior to interactions with the British and during the Opium Wars, Confucian and Neo-Confucian thought was prominent in China. One well-known thinker from this period is Xingyao Zhang. Zhang believed missionaries were harmless and should be welcomed to China. He was a prominent scholar who published his book in Chinese titled *An Examination of the Similarities and Differences Between the Lord of Heaven Teaching [Christianity] and the Teaching of Confucian Scholar's from 1702 to 1715*. Zhang equates the Lord of Heaven (of Christianity) to the Lord-on-High (from Confucianism). He states that the five teachings from Confucianism strongly influenced Chinese culture, as well as the ideas that spread from Christianity. He claims that Confucianism will lead to being saved even if other religions follow one main God instead of separate deities or ancestral lines.⁶⁵

According to Zhang, Western missionaries only came to China to educate and save the world from sin. This aligned with the idea that all religions focus on Heaven and Earth and will lead to an eternal life if one avoids sin. The focus on all forms of religion, as a means of enlightenment and not as a threat to societal customs is referenced in

⁶⁴ Wolfgang Keller, et al., “China’s Foreign Trade,” p. 874.

⁶⁵ De Bary et al., p. 153–54.

Zhang's understanding of the foundational views of different religions. This is important since prior accounts would show the superiority of Confucianism over Christianity. Religion was perceived as a strong nationalistic and isolationist view for the Chinese since it led to the creation of a collective culture. Zhang focuses on three major points to show the similarity between the two different religions. The two religions support each other in regard to basic premises. The points are that the harmonious ideas observed through Confucius' teachings, and the fact that Confucius would have wanted there to be a relationship between the Lord's teaching and the Lord's scholars. In this case, the Lord's scholars also refer to Christian missionaries.⁶⁶

The interaction between the Chinese and Jesuit missionaries in the 19th century increased tensions between the East and the West, which is best expressed through the 1811 statute of the Great Qing Code, titled "Prohibitions Concerning Sorcerers and Sorceresses."⁶⁷ The statute declared that Europeans who preached about the spread of Catholicism would be sentenced to death in China. Following this, British Protestant missionaries entered China in an attempt to convert them to Protestant Christianity and introduce them to Western ideals. This occurred in approximately 1807 and coincided with the Second Great Awakening. The Second Great Awakening was a Protestant religious revival during the early 19th century. These missionaries hoped that a distinction would be made between Jesuit Catholicism and Protestantism so the statute would not apply to them since Jesuit Catholics were mentioned by name.⁶⁸

In the 1980s, Peter Fay critiqued both Fairbank and Chung's perspectives on the opening of China for trade. He claimed that the determination of Protestant missionaries to 'open up' China was crucial to the outbreak of the war. According to Fay, at the beginning of the nineteenth century, China remained untouched and closed off to the rest of the world. During this time there were limited sanctioned interactions between merchants at Canton and the West, since the tribute system was in place. According to Fay, the cause of the Opium Wars lay in the setup of the tribute system since the tensions between Britain and China stem from differing concepts of trade. Fay examines the Opium Wars without a focus on Western relations, but instead, he claims that the Chinese were the ones who opened the country up to trade because of the influence of Western Christian missionaries. Fay only used sources found in the British archives and his

⁶⁶De Bary et al., p. 153–54.

⁶⁷ Will Slatyer, *Life/Death Rhythms of Capitalist Regimes – Debt Before Dishonour: Part III Forecast Dominance* (Partridge Publishing Singapore, 2014), p. 20.

⁶⁸ Slatyer, p. 23.

stance favored the British imperial perspective—that it was their duty to spread their beliefs. Since Fay only focused on sources from British missionaries, he is lacking in the influence of Chinese Christian missionaries like a-Fa Liang. Without examining the Chinese perspective, he was unable to identify the connection between missionaries and the Taiping Rebellion.⁶⁹

Following the First Opium War there was an influx of British Protestant missionaries in China. This led to an increased presence of Christian beliefs in the five treaty ports, which would later spread throughout other areas of China. Liang, a farmer in China, converted to Christianity and became the first Chinese Christian missionary. He wrote a tract titled *Good News to Admonish the Ages*. This would be destroyed by the Qing dynasty so Liang would re-publish the tracts that he had memorized which would then be circulated throughout China. A copy would fall into the hands of Xiuquan Hong, a poor farmer from the Guangdong region. Hong attempted to become a member of *Jingshi* but after failing three times he fell into a period of depression. Once he fell ill, he began to experience hallucinations of a man who he would later claim was God telling him to fight back against the oppressive Qing Dynasty. To better understand his vision there needs to be a close examination of *Jingshi* and the influence of Christian beliefs on the region.⁷⁰

Liang was one of the first converts to Protestantism in China. He was raised on a farm and left his family to become an apprentice for a block cutter in a printing establishment near the foreign factories in Canton. While working as a block cutter he came into contact with Christian texts—though he did not initially understand their meaning, two British missionaries, Robert Morrison and William Milne, helped to enlighten him about the texts. Liang was poorly educated so he was unable to read English, because of this the missionaries would share their teachings with him, and he would write them down in Chinese. In 1816, he was baptized by Morrison and Milne. Liang was the first recognized Chinese Protestant minister who became an ordained minister in 1827 and later worked under the London Missionary Society—the missionaries recounted their experiences in China. In 1830, the London Missionary Society published in London, *Good News to Admonish the World*, detailing the missionaries' time in China and discussing converts like Liang. The text spanned five hundred pages of collections of writings and Chinese periodicals. During this time Liang

⁶⁹ Peter Ward Fay, *The Opium War, 1840-1842: Barbarians in the Celestial Empire in the Early Part of the Nineteenth Century and the War by which They Forced Her Gates Ajar*, (The University of North Carolina Press), p. 1-6.

⁷⁰ Yu-Wen Jen, *The Taiping Revolutionary Movement*, (Yale University Press, 1973), p. 12.

wrote his own manuscript titled, *Good Words to Admonish the Age, being Nine Miscellaneous Christian Tracts* based on the work of the London Missionary Society—there are currently only four known copies of the manuscript. Liang wrote his manuscripts in Chinese, which is important to note since those who were not educated in English were able to read his writings. The manuscript was comprised of pamphlets and quotes that Robert Morrison translated from the Bible. It also included sections of the Scriptures, short sermons, and the importance of the Bible.⁷¹ Earlier versions of the manuscript were destroyed by the Qing Dynasty since they viewed Christianity a threat and associated it with defeat following the First Opium War.

Xiuquan Hong obtained a copy of Liang's manuscript when he was going to take the *Jingshi* examination for the third time.⁷² The examination was based on *The Four Books or Four Canonical Books* that was written during the Song Dynasty, 960-1279 CE, as a basic introduction to Confucianism. These books were collections of Chinese scriptures based on Neo-Confucian beliefs. The civil service examinations were based on these texts. Hong was originally a poor farmer from the Guangdong region in China. This region is in close proximity to the British colony of Hong Kong. In 1837, the Reverend Issachar Jacox Roberts met Hong, who was looking for a Christian missionary to decipher the dreams he was having. Roberts wrote a journal about his experience in China and he explicitly mentioned the teachings he used to educate Hong on Christianity. His writings detail his experience on the inside of the Taiping Rebellion and the steps Hong took to create the rebellion.⁷³ Roberts began his career in China as part of the ministry in Hong Kong in 1842, following the events of the First Opium War. Hong "had envisioned himself as the second son of God."⁷⁴ When Roberts met with Hong, he recalled that he and his companions had copies of the Bible in Chinese and English translations.⁷⁵ This is important because Hong had a fundamental knowledge of Christian beliefs before he implemented them in society.

⁷¹ Eugene Powers Boardman, *Christian Influence Upon the Ideology of the Taiping Rebellion, 1851-1864*. (New York: Octagon Books, 1972) p. 3.

⁷² Walter T. Durham, "A Tennessee Baptist Missionary in China: Issachar Jacox Roberts and the Taiping Rebellion, 1837-1866," *Tennessee Historical Quarterly*, Vol 72, no 2, p. 95.

⁷³ Durham, p. 100-101.

⁷⁴ Jonathan A. Seitz, *A Critical Introduction to Liang A-Fa China's First Preacher, 1789-1855*, (Pickwick Publications, Eugene, Oregon), p. xiv-xv.

⁷⁵ Boardman, p. 117.

After failing the provincial examination to become a member of the gentry under the Qing Dynasty, Hong fell ill for roughly forty days. While he was ill, one of his visions was of a respected man with a white beard and blonde hair who revealed to him that the human race was filled with sinners who have strayed from the work of God. According to Hong, the figure handed him a sword and a seal to fight against the demons in the world, in this case, the Qing Dynasty.⁷⁶ He would later claim that he was the younger brother of Jesus Christ. Hong thought that these visions were God's message to him to stop idolatry. He came to this realization after reading *Good Words to Admonish the Age, being Nine Miscellaneous Christian Tracts* by Liang.

Hong's analysis of his visions culminated in the Taiping Rebellion in 1850. His anger at Qing society stemmed from being blocked out of the social hierarchy created by the Qing. The Taiping became militarized and took action to regain areas of China in their name. Since they began to fight back against the Qing Dynasty, the Qing attempted to squash the rebellion through whatever means necessary. This led to the Qing Dynasty asking the British for help to stop the immediate threat. This rebellion is significant in the grand scheme of Chinese history since approximately twenty to thirty million people died. Some historians claim that this was one of the bloodiest civil wars in history, yet there is a lack of available sources due to the fact that the Qing Dynasty destroyed a majority of the materials relating to the Taiping.⁷⁷

Taiping beliefs, a branch of Christianity using most of the same concepts, was founded by Hong using Liang's manuscript which is said to have been the theological source of the rebellion. One of Hong's cousins informed him that Liang's manuscript was worth reading because of its relation to the disarray in the current state of the Qing Dynasty following the First Opium War. The religious and moral ideas presented in the manuscript helped to inspire Hong to apply these concepts to the Taiping Movement.⁷⁸ *Good Words to Admonish the Age, being Nine Miscellaneous Christian Tracts* used its foundation in the Christian religion and the theological vision Liang proposed about the mixing of Chinese culture. Liang believed Christianity would co-exist within a new form of Chinese society. Hong believed this version of society would be open to potentially radical ideas like those that would later be presented by the Taiping. The mixing of the two religions would make China a stronger country that would not be under the tyrannical Qing Dynasty. Hong used this to justify the creation of the Society of God

⁷⁶ Boardman, p. 119.

⁷⁷ Jen, *The Taiping*, p. 10.

⁷⁸ Sukjoo Kim, "Liang Fa's Quanshi liangyan and Its Impact on the Taiping Movement," (PhD Dissertation, Baylor University 2011), p. 4-6.

Worshippers, which would later be known as the Taiping Heavenly Kingdom. Hong pulled aspects of Liang's manuscript to justify his stance on why the Qing Dynasty should fall. These aspects were Liang's under Confucianism, his conversion to Christianity by Morrison and Milne, the Ten Commandments, and the requirements of being a Christian.

A companion of Hong, Yunshan Feng, created the Society of God Worshippers in Guangxi region in 1844. Their original goal was to spread the ideas read about in Liang's manuscript. Feng was charged with treason in 1848 by a member of the local gentry, Tsohsin Wang. The accusation was based on the scriptures of the Society of God Worshippers; Wang claimed that "They have confused the people and have gathered together several thousand men in order to follow the Old Testament of the barbarians, rather than the law of the Qing Dynasty."⁷⁹ This quote is significant since it portrays the division of loyalty between the elite and the poor. Since Wang was a member of the elite, he claimed that the introduction of Christian values in relation to Chinese tradition was blasphemous because they caused a disregard for the Qing Dynasty and their values.

In 1849, a majority of the members of the Society of God Worshippers were "tenants, farmers, labors, and mine workers."⁸⁰ Of the several thousand members, most came from the Guangdong province—this is noteworthy because there was animosity between them and the Qing elites in the area. Frequent fights over money occurred between the two groups. In 1850, the Qing Dynasty courts appointed Commissioner Lin as the Imperial Commissioner to Guangxi. This was the beginning of Qing intervention against the Taiping. The intervention by Commissioner Lin culminated in the peasant uprising in Jintian Village on January 11, 1851, where the Taiping Heavenly Kingdom and the Taiping Dynasty were established.⁸¹ Hong and his followers prepared for potential conflict against the Qing Dynasty—even though Qing law stated that it was illegal for citizens to possess weapons, the Taiping armed themselves by secretly constructing weapons at a factory owned by a member of the rebel group.⁸² Weapons

⁷⁹ Ho Chen-ch'uan, —*A Treatise on the Establishment of the Heavenly Capital in Chinling, in The Taiping Rebellion: History and Documents*, vol. 2, Documents and Comments, ed., Franz Michael and Chung-li Chang (Seattle, WA: University of Washington, 1971), p. 253.

⁸⁰ Sukjoo Kim, p. 12.

⁸¹ Sukjoo Kim, p. 15.

⁸² Jen Yu-wen Papers (MS 1924). Manuscripts and Archives, Yale University Library. This source was only accessible through a summary since I could not gain access to the

were also smuggled in by the British to aid the rebels with their cause. Since the rebels obtained weapons they were perceived as a threat to the status of the Qing Dynasty.⁸³

Christianity was an important aspect of the Taiping Movement because their initial beliefs about the formation of a new societal structure stemmed from missionaries. Numerous missionaries like Marquis L. Wood, supported the rebel cause since they believed their beliefs would help spread Christianity. Originally missionaries backed and supported the Taiping Rebels. Wood, an American missionary documented his experience in China throughout this period and the good he believed Hong was doing. Hong founded the Taiping Heavenly Kingdom in southern China on the basis that he was the “Heavenly King” or Jesus’ brother. Wood’s perspective of the Taiping rebels was influenced by his Protestant religion since he believed that opening up China to Christianity was justifiable even though the rebels were killing those who went against them. Wood believed that as long as the Taiping were fighting in the name of Christianity, they could continue to fight for their cause.⁸⁴ Despite this, he was prejudiced against the Chinese, which is customary of someone who was raised to believe that their view was the correct and only view. Wood’s diary lacks a timeline of what occurred throughout the rebellion, it tends to focus on his feelings and beliefs. Even though his diary is vague in regard to retelling the events it is significant since it shows the support missionaries initially gave the Taiping.

Important aspects of the Taiping Movement were the Ten Commandments as well as the concept of repentance, the elimination of "perverted spirits," baptism, and praying to God and Jesus Christ.⁸⁵ Since this movement occurred following the Opium Wars, there was an anti-Christian bias present in China. Christianity was linked to foreign aggression and extreme defeat. In turn, the educated classes and the gentry viewed Christianity as sacrilege since it went against Confucian traditions and was considered a threat to Chinese culture by the Qing. During this time the gentry was considered the “guardians of Confucianism.”⁸⁶ Familial ties and heritage in the form of

actual document. The citation is copied from the Yale University Website Library. MS stands for Manuscript.

⁸³ Cheryl M. Lawrence, “The Taiping Rebellion as Seen Through the Eyes of Marquis L. Wood,” *Methodist History*, Vol 44, no. 4, p. 3-5.

⁸⁴ Lawrence, p. 7.

⁸⁵ King-To Yeung, “Suppressing Rebels, Managing Bureaucrats: State-building during the Taiping Rebellion, 1850-1864,” p. 68.

⁸⁶ Robert P. Weller, *Resistance, Chaos and Control in China: Taiping Rebels, Taiwanese Ghosts and Tiananmen*, (Seattle, WA: University of Washington Press,

shrines and tablets were important in Chinese tradition because the concept of family and worship went hand-in-hand in Confucian values. The Taiping rebels would vandalize shrines and destroy ancestral tablets which greatly angered the gentry. The Taiping did this in order to promote Christian monotheism.⁸⁷ Without the events of the Opium Wars, the hostility between the two groups would not have been as apparent. Even though the Taiping did not claim that Confucianism should be eradicated, their actions against those who followed Confucius beliefs drove a wedge in the social structure of society. This is because Confucian officials lost the security previously held in their positions through the *Jingshi* system. The Taiping removed Confucian officials and those with loyalty to the Qing Dynasty from their positions.

As this was occurring, the Qing Dynasty fought against the Taiping army. Ultimately, the Taiping ended up conquering the city of Nanjing, which would become the capital of the Taiping Dynasty since they declared the region to be under their control. The area they conquered was meant to be separate from the Qing Dynasty.⁸⁸ A new bureaucratic system was created under this new dynasty that was different from the social structure in the Qing Dynasty. In turn, the Taiping believed Qing bureaucracy was in the hands of those who monopolized money and power. There was a total of sixteen commissioners in positions of power. One of these commissioners was Commissioner Lin, even though his letter to Queen Victoria helped to initiate the First Opium War. The commissioners served as commanders-in-chief for the Qing Dynasty to plan attacks against the Taiping.⁸⁹ These commissioners were part of the central control of the dynasty since they played a key role in maintaining the Qing system of *Jingshi*. From 1851-1856, 2.3 percent of those in bureaucratic positions in regions controlled by the Taiping were dismissed or demoted. This differs from areas that were not under Taiping control, which had a dismissal rate of approximately 0.5 percent. This reflects the need for Taiping to construct a new social order that supports their agenda.⁹⁰ The Taiping Rebellion was not just a push for Christianity, it was also a push for a change to the political and social structure of China.

1994), p. 39.

⁸⁷ Weller, p. 43.

⁸⁸ See Appendix A, Figure 1.4

⁸⁹ King-to Yeuong. "Suppressing Rebels, Managing Bureaucrats: State-Building During the Taiping Rebellion, 1850-1864," Dissertation, Rutgers, The State University of New Jersey, 2007, p. 62-65.

⁹⁰ King To-Yeung, *Predicted Probability of Dismissal or Demotion in Rebellious Era: Taiping vs. Non-Taiping Provinces*, 2017. p. 117.

Following this, missionaries began to denounce the Taiping Rebellion, which stems from the signing of the *Treaty of Tianjin* between China, Britain, Russia, France, and the United States. The treaty “assured the missionaries of a lawful status as long as the Qing Dynasty remained in power.”⁹¹ This led to a shift in the relationship between Christian missionaries and the Taiping since the missionaries stopped supporting the efforts made by the rebels. The Taiping religion was not a branch of Protestantism, so it was not considered a proper Christian religion.⁹²

The emergence of the Hunan Army initially stemmed from the creation of smaller armies in each province of China. Eventually, the Hunan Army would become a united militia under Guofan Zeng, a retired Vice-President of the Board of Rites. Once the provinces united to form one cohesive army, the breaking down of Confucian values continued because this form of unity went against the initial Confucian views. Without the combination of the different provinces into one army, the chances of defeating the Taiping would have been slimmer. The emergence of a strong united militia in the form of the Hunan Army helped to squash the Taiping Rebellion. In August 1860, the Taiping decided they wanted to take over Shanghai which would expand their empire and region of control. They were met with Qing troops commanded by Zeng, the leader of the Hunan Army, and a British naval blockade. Zeng was also a Confucian scholar who was a descendant of the philosopher Zengzi who was a student of Confucius. Through Zeng’s experience learning about Confucianism, he applied it to his battle strategies.⁹³

Zeng was appointed to the Qing Dynasty as Commissioner of the Militia of Central China in 1852. He was tasked with arming approximately 17,000 men with weapons and training. Under Neo-Confucian ideology the saying of the army during the First Opium War was “Soldiers had no fixed commander, commander had no fixed soldiers.”⁹⁴ This differed from the saying during the Taiping Rebellion, which was “Soldiers followed the general, soldiers belonged to the general.”⁹⁵ This shift shows the

⁹¹ Kenneth S. Latourette, *The Chinese: Their History and Culture*, 4th ed. (New York: Macmillan Company, 1964), p. 280-81.

⁹² Latourette, *The Chinese: Their History and Culture*, p. 280-81.

⁹³ Latourette, *The Chinese: Their History and Culture*, p. 280-81.

⁹⁴ Jonathan Chappell, “The Limits of the Shanghai Bridgehead: Understanding British Intervention in the Taiping Rebellion, 1860-62,” *The Journal of Imperial and Commonwealth History*, vol. 44, no. 4, 2016, p. 539-541.

⁹⁵ William T. Rowe, *China's Last Empire: The Great Qing (History of Imperial China)*, (America: 2009), p. 301.

influence of the British in China because beforehand the Chinese saying reflected the lack of unity in their militia; after the British got involved a uniform collective was created. The prior saying also references the connection to familial ties and Neo-Confucian values against war since there was no drive to fight for one cause. With British intervention, the concept of a leader and personal gain was present in the set up of the Chinese militia.

The battle for Shanghai continued through January 1862, when the Taiping were ultimately defeated. This is because of resistance created by the Hunan Army supported by troops commanded by Charles George Gordon, a British administrator and army officer who was a member of the British Army. The army he commanded in China became known as the “Ever Victorious Army” because it used British military tactics to successfully destroy the Taiping rebels. The army was comprised of Chinese soldiers and led by European officials. The “Ever Victorious Army” was only active from 1860 to 1864 during the Taiping Rebellion since the Qing Dynasty requested aide from Britain. This is due to the fact that the Qing Dynasty did not have a structured militia and they lacked aide since there was a lack of assets because of the reparations they were forced to pay to Western nations. These reparations were placed on the Qing Dynasty from the First and Second Opium War in the “unequal treaties.” Once the British sent aide to the Qing Dynasty, their military leaders implemented European techniques, tactics, and strategies to the training regimen. This played an important role in putting down the rebellion because the Taiping were fighting using brutal tactics that were not uniformed, it was similar to guerilla warfare. This is notable because the “Ever Victorious Army” was the first Chinese army to utilize European techniques, tactics, and strategy.⁹⁶ The reconquest of areas under Taiping control slowly began with the command of Zeng and by 1864, a majority of the areas were back under Qing control.

In May of 1862, the Hunan Army along with the “Ever Victorious Army” began to surround Nanjing.⁹⁷ Hong claimed that God would defend the capital, but the Hunan Army cut off supply routes that led to the city, so the city was in turmoil. He died of food poisoning directly following the low supply of food. Before his death, he was sick for roughly twenty days and he continued to preach that God would protect his followers despite the impending threat. Following Hong’s death, the Qing army overtook the city. Four months before his death and the fall of the Taiping Heavenly Kingdom, Hong handed the throne to his eldest son Tianguifu Hong at the age of fifteen. His inexperience as a leader only hindered the Taiping Heavenly Kingdom. He was unable to

⁹⁶ Bruce A. Elleman, *Modern Chinese Warfare, 1795-1989*. (Routledge: 2001), p. 52.

⁹⁷ The Hunan army is also referred to as the Xiang Army in some sources.

rectify street-fighting and other internal issues that helped lead to the fall of the empire. Once the empire fell, Tianguifu and the other Taiping princes were executed to extinguish the bloodline of the empire. Those who remained loyal to the Taiping kept fighting until they were pushed to the “highlands of Jiangxi, Zhejiang, Fujian and finally Guangdong.”⁹⁸ Any Taiping supporters left were moved out of the prosperous areas of the Qing Dynasty and back to the farmlands. Once defeated the Qing dynasty attempted to erase the events of its history since it was one of the bloodiest civil wars. They destroyed most firsthand accounts of the war. Roughly twenty to thirty million people died during this rebellion.⁹⁹ This is a historic number because the death toll because of the influence it had on both sides. Approximately 100,000 people died in the last battle that overthrew the Taiping Dynasty. In the end, the Qing victory led to the fall of the Taiping Heavenly Kingdom. Despite this victory, the central government of *Jingshi* weakened due to distrust of peasants and some officials based on the fact that the Taiping were able to rise to power in the first place. This rebellion negatively affected the perception the Chinese had of Christianity because of the radical views and actions of the Taiping. Missionaries became unsure of their presence in China because Qing officials no longer backed them.¹⁰⁰

The relationship between the British colony of Hong Kong and China held fast until Hong Kong was handed back to China in 1997.¹⁰¹ The British Governor of Hong Kong at the time was Sir David Wilson—he was the 27th person to hold that title. During this time, he was preparing to return Hong Kong to the Chinese since the contract made in the *Treaty of Nanjing* of being a colony expired. Even though it was decided that Hong Kong would be returned to China in 1984, the actual act of ceding Hong Kong back to China occurred in 1997. The Chinese government agreed to allow the colony’s capitalist system to remain unchanged once it was back under their control.

Despite Western influences in regard to the economic foundation of Hong Kong, it was by no means a democratic society. Ideas like “free speech, thought, and opportunity” were also present among the Hong Kongese.¹⁰² A hybrid culture existed

⁹⁸ Richard J. Smith, *Mercenaries and Mandarins: The Ever-Victorious Army in Nineteenth Century China* (Millwood, N.Y.: KTO Press, 1978), p. 24-29.

⁹⁹ Stephen R. Platt., *Autumn in the Heavenly Kingdom: China, the West, and the Epic Story of the Taiping Civil War*. (New York: Knopf: 2012)

¹⁰⁰ Thomas Reilly, “Sectarian Conspiracy in the Taiping Rebellion: The View from the Chinese Elite,” *Department of History, Pepperdine University*, p. 24-26.

¹⁰¹ Wolfgang Keller, et al., “China’s Foreign Trade,” p. 864, 870, 874-875.

¹⁰² Morris, p. 4.

which focused on globalization, “the convergence of economic and financial systems world-wide.”¹⁰³ Once combined with the People’s Republic of China, the former colony could maintain its capitalist economic system. Deng Xiaoping, the leader of the People’s Republic in China from 1978 to 1992, coined the term as “one country, two systems.” The original agreement was that Hong Kong would be left alone by China until 2040. Since Hong Kong was economically sufficient due to the trading infrastructure created by the British during the Opium Trade the people were more susceptible to British thought. This led to a decline in traditional religious beliefs, as well as reducing the role of the family—this was previously important under Neo-Confucian thought because of the role of *familial piety*. In 1970, Hong Kong was mostly an affluent capitalist colony that did not follow traditional Confucian beliefs such as order, self-control, and discipline. These values were prominent in Chinese culture even following the fall of the Qing Dynasty and the rise of Communism. The differing values of family ties and individualism created dissonance between Hong Kong and China. This would lead to a cultural identity crisis for the Hong Kongese because there was uncertainty surrounding if they were British, Chinese, or their own people.¹⁰⁴

This is relevant to understand the issues occurring in present day Hong Kong regarding the protests. Without the influence of the British during the period of the Opium War and their treatment as a British Crown Colony, the Hong Kongese would never have created their identity based on economic success and individualization while rejecting traditional Confucian values. In February 2019, Hong Kong’s Security Bureau submitted papers that proposed a new amendment to the existing legislature. This would provide for a case-by-case examination of extraditions, where one jurisdiction delivers a person accused or convicted of committing a crime in another jurisdiction. In this case those who committed a crime in Hong Kong would be sent to China whose jails were much harsher than Hong Kong’s.

In March 2019, protesters went to the streets because of the possible extradition bill. The bill stated that transfers of fugitives for all of China would occur and legal assistance would be made between Hong Kong and other nations to catch the criminal. There were five demands in place—they were: to withdraw the extradition bill; to look into alleged police brutality; that protesters should not be referred to as rioters; to pardon

¹⁰³ Kam Yi-Mak and Larry Harrison, “Globalisation, Cultural Change, and the Modern Drug Epidemics: The Case of Hong Kong,” *Health, Risk, & Society*, vol 3, no. 1, 2001, p. 40.

¹⁰⁴ Yi-Mak and Harrison, “Globalisation, Cultural Change, and the Modern Drug Epidemics,” p. 50-55.

protesters who were arrested; and to introduce a direct election for the governor and assembly instead of the current system where forty to sixty percent were elected based on profession.¹⁰⁵ These demands were not agreed upon so civil unrest continued. The ongoing conflict will surely heighten tensions between China and Hong Kong. The public memory of being a British colony with certain freedoms led the people of Hong Kong to look towards Britain and America for assistance in maintaining their freedoms. Currently, revolts are still happening and at least one person has died. The impact these revolts will have on Hong Kong is uncertain but the remembrance of them will surely influence relations between China and Hong Kong in the future.

The introduction of Western values like individualism, capitalism, and Christian religion influenced the development of Hong Kong while also introducing concepts that were applied to the Taiping Rebellion. The First Opium War left China in shambles due to the reparations placed on the country from the treaties that opened up more ports for trade. This made China more susceptible to Western values. The interactions between Britain and China during the First Opium War became the catalyst for Xiuquan Hong to analyze his visions and status in Qing Society. To deal with his failure to join *Jingshi*, he used Protestant Christian beliefs and Liang's manuscript to create the Taiping Rebellion. The Taiping's tactics against the bureaucracy of the Qing Dynasty led to one of the bloodiest civil wars in history. Despite this, the Taiping rebels were crushed once the British intervened on behalf of the Qing. This foreshadows the influence of Western beliefs on Hong Kong when it was a British Crown Colony. The culmination of the differing values between Hong Kong and China led to the protests currently happening. The influence of public memory of the First Opium War and the Taiping Rebellion is relevant to understanding the current political climate in Hong Kong.

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¹⁰⁵ Timeline: Key dates in Hong Kong's protests, <https://www.reuters.com/article/uk-china-anniversary-timeline/timeline-key-dates-in-hong-kongs-protests-idUSKBN1WG3XX>

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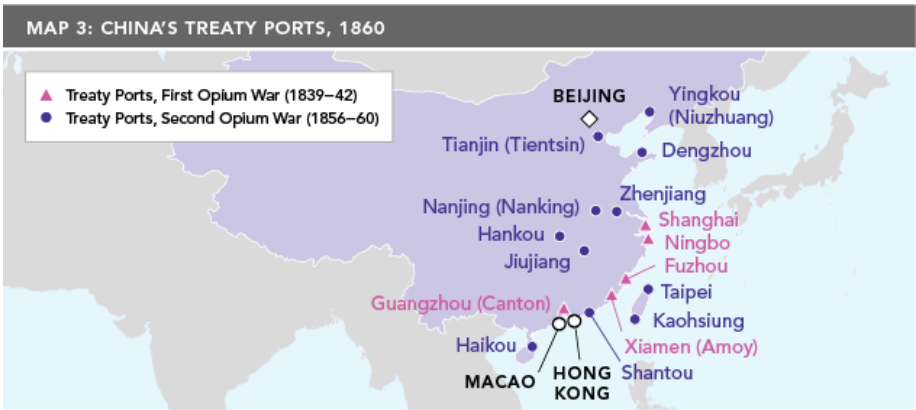
Appendix A



(Figure 1.1)



(Figure 1.2)



(Figure 1.3)



(Figure 1.4)

How Misrepresentations of Transgender People in Film and TV Affect Society

Paige Tolbard¹

Most people will live their entire lives without ever questioning their gender identity. For a lot of humans, the way they dress and act is socially acceptable because it matches the assumed behavior of the gender assigned by their genitals. But what if wearing dresses as a person with a penis could get you killed? For many Americans, that is the case. By October of 2019, nineteen transgender people had been killed due to transphobic violence, and eighteen of them were women of color.² The real number of trans people killed is most likely larger, as many trans victims of violence are misgendered in police reports. While nineteen may not seem like a large number, it is nineteen people who were killed for exercising their freedom of speech and expression. Why do transgender people evoke so much hate and discomfort from cisgender people? The main cause of violence against any marginalized group is ignorance. Most cisgendered people have met very few or never met a transgender person, or have never learned what it truly meant to be transgender. This can leave people with the wrong ideas about how transgender people live. When movies like *Mrs. Doubtfire* (1993), *Ace Ventura* (1994), and *Silence of the Lambs* (1991) portray transgender people as liars, traps for straight men, or killers, viewers of these films who know nothing about the real transgender identity have nothing else to believe. Lack of accurate portrayal of transgender people in film and TV contribute to the negative perceptions of transgender people in society.

To be transgender means to have a different gender identity than the one you are assigned at birth. Being transgender does not mean one is a pedophile, a psychopath, deranged, nor does it mean one has a mental illness. In the 18th and 19th centuries, many scientists declared that homosexuality and transsexualism meant the same thing. “Invert” was the word they used to classify anyone with characteristics of the opposite gender.³

¹ Written under the direction of Dr. Laura Morowitz for AH324-HO: *Gender in the Visual Arts*.

² Trudy Ring, “These Are the Trans People Killed in 2019” *The Advocate Mag* (OUT: 2019) <https://www.advocate.com/transgender/2019/5/22/these-are-trans-people-killed-2019#media-gallery-media-1>.

However, identifying as homosexual is classifying one's sexual orientation, while being transgender is classifying one's gender identity. In the simplest of terms, being homosexual refers to if someone is attracted to men or women, while being trans refers to someone being a man or woman. The fact that it took so long for the two terms to be distinguished from one another demonstrates the lack of understanding surrounding the transgender experience. Even today, most people who are not transgender do not know much about being transgender, or the process of transitioning.

Despite being a member of the LGBTQIA+ community, transgender people often face discrimination from gay and queer people as often as they face discrimination from straight and cis gendered people. In the beginning of the movement for gay rights, many gays felt that transgender individuals represented a part of the LGBT community that was "too transgressive," and did not want to be associated with transgender people⁴. In addition to outside criticism, many transgender people experience feelings of internalized transphobia, where they feel that their identity and their feelings are morally wrong and unnatural. With all of these societal pressures telling transgender people that they do not belong in society, films and TV that support the transphobic notions only make existing more difficult for trans people.

Many movies that have received awards and praise from critics actually include harmful portrayals of transgender people. For example, the movie *Mrs. Doubtfire* (1993) directed by Chris Columbus, casts Robin Williams as a father whose only way to interact with his children is to dress up as a female housekeeper in his children's home. Williams' character was not even an identifying transgender woman, his character was simply someone that used a costume to try and connect with his children. The scene where his children found out about his actual identity is the controversial aspect about the film. One of his sons sees him using the bathroom standing up while wearing a wig and a dress. To the child, seeing a person who is feminine presenting stand up to use the bathroom is unsettling. His son screams in fear of the person using the restroom, and refuses to talk to Mrs. Doubtfire. The son calls Mrs. Doubtfire "he-she" to his sister, and proposes the idea of attacking Mrs. Doubtfire in the scrotum.

While the son is only 10 or 11 years old, his first reaction to finding out someone is transgender, is to attack them, despite never being harmed by the transgender individual. Once the son finds out Mrs. Doubtfire is really his father, he asks his father,

³ Camden Goetz, "History of the Word: Transgender" (Point Foundation: 2019).
<https://pointfoundation.org/history-word-transgender/>

⁴ Ibid.

“you don’t really enjoy doing this, right?”⁵ as a way to be reassured that his father is still a “normal” person. William’s role and his son’s reaction perpetuate the idea that people who are transgender are lying, hiding something, and are not to be trusted. It is marketed as a family film, but includes scenes and dialogue that contribute to the misrepresentations of transgender people.

Many lovers of the film *Mrs. Doubtfire* (1993) argue that the scene was simply a part of a comedic film, and its meaning should not be exaggerated. The truth is that scenes like this have the power to contribute to societal attitudes to the subjects they portray. Take, for example, the issue regarding legislation on transgender people using public restrooms. In 2016, the South Carolina legislature passed a bill that requires individuals to use only the gendered bathroom that matched the gender one was assigned at birth. The legislation was made right after President Obama’s term ended, and the “Department of Education announced that under the Trump administration, the department would no longer enforce Obama-era protections for transgender students to use the restroom that aligns with their gender identities.”⁶ The change in legislation was directly enacted to disenfranchise the transgender community of South Carolina.



Robin Williams as Mrs. Doubtfire

Many supporters of the bill argued that having people who identify with a gender different from the one they were assigned at birth was unsafe for cisgendered

⁵ *Mrs. Doubtfire* (1993; Hollywood: 20th Century Fox, 1993), Dir. Chris Columbus.

⁶ Spencer Leland G, “Bathroom Bills, Memes, and a Biopolitics of Trans Disposability” (*Western Journal of Communication*, 2019), 83:5, 542-559.

people, as the individual's presence put people at risk for sexual assault and harassment. Basically, cisgendered people were scared that men who "dressed up as women" would rape the women in the restroom. Rather than attempting to tackle the issue of rape culture and sexual assault against women, South Carolina's legislature decided this would be the best way to "protect" its citizens. This reasoning subliminally implies that the transgender people of South Carolina are not citizens, as the legislation was meant to protect the states' cisgender population and directly discriminate against transgender people. Furthermore, the state legislature failed to recognize the disparities between violence committed by transgender individuals rather than the violence committed against transgender individuals. A survey done by the University of Hawaii about violence against transgender individuals determined that "the most common finding across the surveys and needs assessments is that about 50% of transgendered persons report unwanted sexual activity."⁷ The basis of the law was to protect cisgendered people from sexual violence from transgender people. In reality, trans people face more sexual violence from cisgendered people than they commit the sexual violence towards cisgendered people.

Another film is the classic film *Ace Ventura* (1994). Jim Carrey plays a character who has a love interest with a transgender woman. Jim Carrey's character, Ace Ventura, has to track down the criminal that took the Miami Dolphins team mascot, and it turns out to be the team's former kicker, Ray Finkle. However, at the time of Ace's discovery, Finkle no longer identified as a man, and was living as a woman named Lois Einhorn. The love connection is quite pure, up until the point Jim Carrey's character finds out that the woman was born as a man. Once he realizes the woman he has kissed is transgender, he furiously brushes his teeth and rinses his mouth out, disgusted by the idea that he could ever have contact with a transgender person. The title of the scene is "she's a man." The film is labeled as a comedy, and while Jim Carrey is attempting to rid his mouth of any remnants of the transgender woman the audience is receiving the scene as comedic relief. The disgust of being with a transgender woman is supposed to be perceived as funny to the audience. Again, this adds to the idea that transgender women are out to trick straight men. While there are underlying homophobic themes of the scene, the main argument is that the woman who used to be a man was somehow lying to Ace, and that their love is considered disgusting. In *Ace Ventura* (1994), when Jim Carrey

⁷Rebecca L Stotzer, "Violence against Transgender People: A Review of United States Data" (*Violence and Aggression*, 2009), 170–79.

screams “she’s a man!”⁸ after discovering that the woman he kissed was born a man, he misgenders Lois and deliberately disrespects her identity.

This scene contributes to the infamous “misgendering” phenomenon almost every transgender person has experienced in their life. To misgender a person is to use the incorrect pronouns to describe them; as in, calling someone who identifies as a woman, “he” or “him.” Misgendering is incredibly disrespectful and undermining to transgender individuals, as it discounts their attempts to be recognized as the gender they feel most comfortable expressing themselves as. The Department of Psychology at the University of California conducted an experiment where transgender individuals documented the times that they were misgendered to examine the psychological effects of misgendering. “Participants who reported more frequent experiences with misgendering reported more identity importance, but less identity strength and congruence, than participants who reported less frequent experiences with misgendering.”⁹ When a cisgendered person refuses to use a transgender person’s preferred pronouns, it is an attempt to ostracize the individual, and makes the transgender individual feel stigmatized.

Both films *Mrs. Doubtfire* (1993) and *Ace Ventura* (1994) fall under the film category of “comedies,” but many classic horror films also include astoundingly transphobic messages. Take for example, the timeless horror film *Silence of the Lambs* (1991). The plot centers around a female FBI agent tracking down a serial killer named “Buffalo Bill” who skins women and kills them. Buffalo Bill’s character is sadistic, creepy, and coincidentally, gender queer. While his name is Buffalo Bill, the film includes a scene of the killer dressing up in makeup, feminine clothing, and styling his hair to that of a woman’s.¹⁰ It is obvious that Buffalo Bill does not conform to the typical gender norms of a man, and to include that as a main characteristic for the film’s notorious serial killer was an interesting choice of the film maker.

Buffalo Bill express himself with excessively feminine mannerisms and clothing right before attempting to kill his final victim. This aspect of his identity was used by the filmmaker to add to his disturbing nature, as it attempted to make the viewer even more uncomfortable with Buffalo Bill. While there is no denying Buffalo Bill is a sinister human, his gender expression should not contribute to his identity as a killer. The film was made in the 1990’s, at a time when little to no characters on TV were transgender or

⁸ *Ace Ventura: Pet Detective* (1994; Hollywood: Warner Bros, 1994) Dir. Tom Shadyac.

⁹ Kevin McLemore, “Experiences with Misgendering: Identity Misclassification of Transgender Spectrum Individuals.” (*Self and Identity*, no. 14, 2015): 51–74.

¹⁰ *Silence of the Lambs*, (1991; Hollywood: Orion Pictures, 1991). Dir. Jonathan Demme.

gender queer. Portraying a serial killer as a transgender person creates a negative and false representation of transgender people that had not been widely refuted.



Buffalo Bill in *Silence of the Lambs*

The same theme goes for Hitchcock’s famous horror film *Psycho* (1960)¹¹. The film revolves around a woman, Marion, on the run who stays at the character Norman Bates’ motel. Bates’ and his mother have a complicated relationship throughout the film, but the plot focuses on his relationship with Marion as he grows fond of her during her stay in his motel. While showering in her room’s bathroom, Marion is killed by an unknown figure. The scene of her death is incredibly jarring, and many critics have read the scene as both a murder and a rape scene from the intentional camera angles used by Hitchcock. As it turns out, Bates is actually the woman’s murderer. What was even worse, was that he dressed as his mother while he killed the innocent woman. For this reason, *Psycho* (1960) becomes yet another horror film portraying someone who dresses as the opposite gender as a psycho and a killer.

Even though both films were created over 20 years ago, many of society’s perceptions of transgender individuals have remained the same. In fact, many transgender individuals avoid seeking help from healthcare professionals due to risk of being labeled as a “freak” by the healthcare facility’s staff. A study done by the American College of Emergency Physicians surveyed transgender and gender non-conforming individuals as to what they believe would improve their experience as a gender queer patient in the healthcare system. One of the participants stated that:

¹¹ *Psycho*. (1960; Hollywood: Shamley Productions, 1960) Dir. Alfred Hitchcock.

These types of experiences generated mistrust and lack of confidence in care quality. Participant 22 (transwoman) asked, “Sort of makes you wonder, if they can’t get your gender identity correct, what else along the way is being misconstrued. What else are they screwing up behind the scenes that you don’t know well? Or what other information isn’t getting passed along properly?”¹²

Negative stigmas surrounding transgender patients can affect not only the way they are treated by the doctors, but also the quality of medical care they receive. With films like *Silence of the Lambs* that represent transgender individuals as freaks, the stigmas become even harder to debunk.

In conclusion, people who identify as transgender face prejudice from society and transphobic people in their everyday lives. When films decide to cast cisgendered individuals to portray the transgender experience or identity in a negative light, their role reinforces the uneducated assumptions about transgender individuals. The assumptions that people who are transgender are liars, freaks, or deceptive. Children who grow up on movies such as *Mrs. Doubtfire*, that never meet a transgender person in real life, and are never introduced to films representing transgender characters in a positive light, have no reason to believe that transgender folks are not what Robin William’s played them as. This ignorance is what keeps trans people from being able to use the restroom of their choice, reach out to receive medical attention, or simply express themselves without facing discrimination. To reduce the prejudice around transgender folks, the transgender identity has to be normalized and destigmatized. To prove the negative stereotypes wrong, more films that represent the concept of being transgender as normal and human have to be produced. Recently, shows such as *Orange is the New Black* (2013) and *Pose* (2018) have casted trans women to play the role of trans women, and highlighted their experiences as trans individuals. Both shows include scenes about violence and discrimination the women received for identifying as transgender, which give the viewers who are not transgender, a chance to understand the difficulty of being transgender. Unfortunately, both of those shows are relatively new to television screens, and have very specific audiences viewing both shows. To reach out to viewers who would not be inclined to watch shows centered around LGBT+ issues, positive portrayals of transgender characters and experiences must be incorporated into mass media and

¹² Elizabeth Samuels, Chantal Tape, Naomi Garber, Sarah Bowman, and Esther K. Choo, “‘Sometimes You Feel Like the Freak Show’: A Qualitative Assessment of Emergency Care Experiences Among Transgender and Gender-Nonconforming Patients.” (Providence: Elsevier Inc, 2017)

popular films and shows that a wide range of viewers watch. The task is not impossible to complete, but it must include the work of cisgendered folks using their privilege to give marginalized transgender people a platform. Society has to call out actors like Jim Carrey who willingly play roles that are outwardly transphobic, and hold both the actors and viewers to a higher standard.

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