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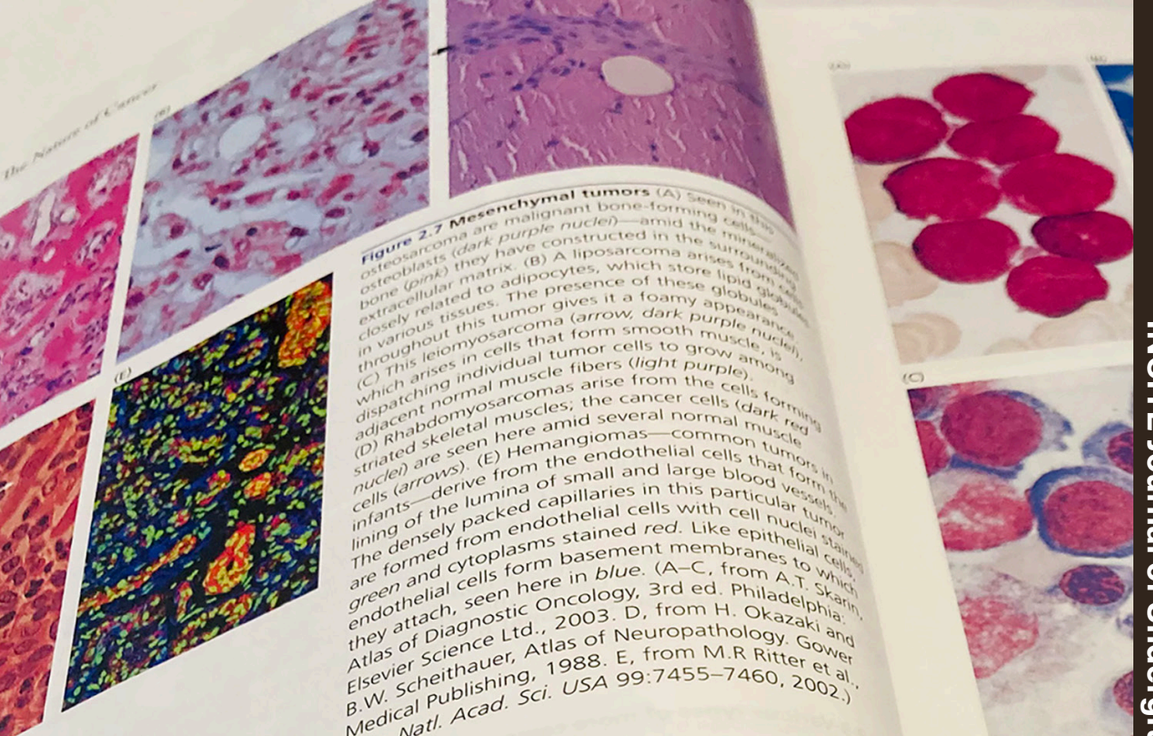

Figure 2.7 Mesenchymal tumors (A) Seen on X-ray, osteosarcoma are malignant bone-forming cells—osteoblasts (*dark purple nuclei*)—amid the mineralized bone (*pink*) they have constructed in the surrounding extracellular matrix. (B) A liposarcoma arises from cells closely related to adipocytes, which store lipid globules in various tissues. The presence of these globules throughout this tumor gives it a foamy appearance. (C) This leiomyosarcoma (*arrow, dark purple nuclei*), which arises in cells that form smooth muscle, is dispatching individual tumor cells to grow among adjacent normal muscle fibers (*light purple*). (D) Rhabdomyosarcomas arise from the cells forming striated skeletal muscles; the cancer cells (*dark red nuclei*) are seen here amid several normal muscle cells (*arrows*). (E) Hemangiomas—common tumors in infants—derive from the endothelial cells that form the lining of the lumina of small and large blood vessels. The densely packed capillaries in this particular tumor are formed from endothelial cells with cell nuclei stained *green* and cytoplasms stained *red*. Like epithelial cells, endothelial cells form basement membranes to which they attach, seen here in *blue*. (A–C, from A.T. Skarin, Atlas of Diagnostic Oncology, 3rd ed. Philadelphia: Elsevier Science Ltd., 2003. D, from H. Okazaki and B.W. Scheithauer, Atlas of Neuropathology. Gower Medical Publishing, 1988. E, from M.R Ritter et al., *Proc. Natl. Acad. Sci. USA* 99:7455–7460, 2002.)

layer of the early embryo. Included here are **gliomas**, **glioblastomas**, **neuroblas-**
tomas, **schwannomas**, and **medulloblastomas** (**Figure 2.9**). While comprising only
.3% of all diagnosed cancers, these are responsible for about 2.5% of cancer-related
eaths.

3 Some types of tumors do not fit into the major classifications

all tumors fall neatly into one of these four major groups. For example, **melano-**
derive from melanocytes, the pigmented cells of the skin and the retina. The
nocytes, in turn, arise from a primitive embryonic structure termed the **neural**
While having an embryonic origin close to that of the neuroectodermal cells,

Figure 2.8
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atopoietic malignancies (A) Acute lymphocytic
) arise from both the B-cell (80%) and T-cell (20%)
phocytes (see Section 15.1). The cells forming
umor (*red-purple*) exhibited the antigenic markers
in from pre-B cells. (B) As in many hematopoietic
these acute myelogenous leukemia (AML) cells
nly a small rim of cytoplasm around their large nuclei.
from precursor cells of the lineage that forms various
anulocytes as well as monocytes, the latter developing,
o macrophages, dendritic cells, osteoclasts, and other
cific phagocytic cells. (C) The large erythroblasts in this
ukemia (*red-purple*) closely resemble the precursors
of differentiated red blood cells—erythrocytes. (D) In chronic myelogenous leukemia (CML), a variety of leukemic cells of the myeloid (marrow) lineage are apparent (*red nuclei*), suggesting the differentiation of myeloid stem cells into several distinct cell types. (E) Multiple myeloma (MM) is a malignancy of the plasma cells of the B-cell lineage, which secrete antibody molecules, explaining their relatively large cytoplasms in which proteins destined for secretion are processed and matured. Seen here are plasma cells in MM at various stages of differentiation (*purple nuclei*). In some these micrographs, numerous lightly staining erythrocytes are in the background. (From A.T. Skarin, Atlas of Diagnostic O
4th ed. Philadelphia: Elsevier Science Ltd., 2010.)

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FOURTH EDIT N

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From the Dean

Dr. Roger A. Byrne, Dean,
Cook-Cole College of Arts & Sciences

Longwood University prides itself on producing citizen leaders, and one of the ways in which this leadership is produced and honed is through the individual and small-group efforts of students in forming their own scholarly and creative works. The process instills development of critical thought and enhancement of skills. But more than this, it also cultivates persistence through overcoming initial failures and challenges while striving to attain a goal, a sense of shared purpose through working collaboratively with faculty and peer mentors, and it results in a great sense of accomplishment when the act of creation is complete. This happens in many ways and at many times throughout a Longwood student's progress through his or her educational program. What is included here in this slim volume is a carefully selected set of examples of the works of Longwood students that demonstrate the best of what can be achieved. It serves as a model and a testament to the efforts of the students involved and their faculty mentors and collaborators.

On behalf of the three undergraduate Colleges involved, I would like to acknowledge and thank the students who permitted their work to be included, and the faculty mentors who guided the students in the creation of these works. I would also like to thank the faculty board, the editor, and the student helpers for all their efforts in producing this fine volume.

I hope you take some time to review the works included in this volume of Incite and you will come away with a greater appreciation for the achievements of our students.

From the Editor

Dr. Larissa "Kat" Tracy
Department of English & Modern Languages

The 2021–2022 academic year marks the return of *Incite* after the Covid-19 pandemic irrevocably shaped the global community and Longwood University. During the 2020-2021 academic year, we tried to solict contributions for *Incite*, but our students, like so many, were still being affected by the ongoing pandemic and we were not able to produce an issue. In truth, the pandemic is not over, but we are contuning on in this new reality. Student research has been forever transformed, as some of the contributions in this issue attest. Our students have worked very hard to regain a sense of normalcy, and the quality of the submissions in this issue are testament to their perseverance. The Faculty Board and the student contributors have worked very hard to bring out this current issue of *Incite*.

In 2019, we established a new Faculty Advisory Board, comprised of volunteers within the various departments of CCCAS, who worked diligently to refashion the submission guidelines in order to offer publishing opportunities to a larger body of students. This year, the colleges of Education and Business joined the CCCAS in sponsoring *Incite*. We have added faculty from each of these colleges to the Board, and we are now collaborating with the Office of Student Research. These Board members worked tirelessly to review and comment on the student submissions, ensuring that each piece is of the highest caliber. There have been a few adjustments to that Board, and I am extremely grateful to all who have been willing to serve. Dr. Amorette Barber, director of OSR, has been a stanuch supporter of the journal, and together we have implimented Faculty Mentorship Awards in additon to the student prizes for best papers, and have publicized the journal across the university community. We are now accepting student submissions from all university colleges. Other faculty members also stepped up when asked to review submissions within the various disciplines over the 2020–2022 academic years, namely Dr. David Coles, Dr. Philip Cantrell, Dr. Scott Grether, Dr. Elif Guler, Dr. Melissa Kravitz, Dr. Heather Lettner-Rust, and Dr. Sarah Varela.

In 2019, we implemented a new design by students in the Design Lab under the supervision of Chris Register and Wade Lough, and even though this year's issue was not produced by the Design Lab, we intend to remain faithful to their design concept.

Like last year, the student contributors were a pleasure to work with; they met deadlines and they worked in the spirit of cooperation to get their pieces in publishable form. It would not have been possible to produce this journal without the *Incite* faculty and student volunteers.

This journal is truly a team effort. From the students who submitted their work, to the individual faculty advisors who spent the time outside of class to help them revise and professionalize their submissions, to the Faculty Board members who vetted them, to the Printing Office that met our deadlines and delivered this amazing volume, to CCCAS Dean Roger Byrne who has given this endeavor his full support from the beginning, interim Dean of the College of Education and Human Services Dr. Lissa Power-deFur and Dean of Business and Economics Dr. Timothy O'Keefe who joined our team this year, and Dr. Amorette Barber in OSR who has made furthering the reach of this journal her mission, we could not have done it without you. Especially at this time, when we are slowly emerging from two years of a global pandemic, it is important to showcase the outstanding accomplishments of our students and the faculty who mentor them. We rely on the dedication of faculty, students, and staff to promote the best of undergraduate research at Longwood University so that this journal, *Incite*, can continue. Thank you very much for all your hard work in making this possible.

From the Designers

Rachel English
Rachel Hanson
Longwood University
Graphic Design, 2019

Welcome to the redesigned *Incite*. The changes we made were intended to give this academic journal a new design voice. As designers, our intention was to create a journal that would communicate its purpose as an academic publication, but also please its audience visually. There is an established format that journals and scholarly articles tend to fall into, but we have learned in our design study at Longwood to bring a fresh perspective to established design. Without the guidance and assistance of our professors none of this would have been possible. We are thankful to everyone who helped make this journal possible, and grateful for the opportunity to help craft the eleventh edition of the undergraduate academic journal. We hope you enjoy it.

The Effect of Compliment Type on the Estimated Value of the Compliment

Payton Davenport, Audrey Lemons, and Jacob Shope
Faculty Advisor: Dr. Sarai Blincoe
Department of Psychology
Awarded first place Social Sciences paper

Abstract

Boothby and Bohns (2020) created a study in which those who give compliments underestimated the value that their compliment would have on the person receiving it (Boothby & Bohns, 2020). Our study was a conceptual replication of the Boothby and Bohns (2020) study and focused on the effect of different compliment types on the level of underestimation from both the receiver and giver. Participants were randomly assigned to give one of two different compliment types (physical appearance or attire) to a stranger. Although the effect of the dependent variable, measured level of underestimation, supported our first hypothesis thus supporting prior findings, there was no difference between the compliment type's level of underestimation. Our results indicate that people do underestimate the impact of their compliment regardless of the specific type of compliment given. From our research findings, we discussed the relevance of how individuals tend to underestimate a compliment's value despite it being a form of prosocial behavior with positive outcomes.

The Effect of Compliment Type on the Estimated Value of the Compliment

A small compliment can have a lasting and positive impact on an individual, yet the act of complimenting a stranger is often avoided (Boothby & Bohns, 2020). Given past research on the frequency of engagement in prosocial behavior, people who do engage in that behavior enjoy helping others. Prosocial behavior and stranger interaction lead to more positive and happy feelings and increased well-being (Sun et al., 2019; Zhao & Epley, 2021). With this information, then why do individuals refrain from the act of complimenting as a form of prosocial behavior? Compliment giving is a form of prosocial behavior which can play a positive role in people's day-to-day well-being, but people do not often engage in certain acts of this behavior because they underestimate the positive impact or value of their behavior (Boothby & Bohns, 2020; Weinstein & Ryan, 2010).

After examining previous research, it was found that one of the main reasons people engage less frequently in compliment giving is due to the belief that their actions will not affect the other individual (Kumar & Epley, 2018; Zhao & Epley, 2020). Boothby & Bohns (2020) explored the question of why people do not give more compliments and found that similar to past research, people misinterpret the value their compliment has on others, preventing them from engaging in the behavior. This could be due to the egocentric bias, which is the explanation that people use their perspective to predict the state of others. According to Kumar (2021), if a person underestimates the impact of their compliment and believes their statement could be misinterpreted, then they are likely to believe the receiver will as well. Kumar (2021) also notes that a person focuses on the competence of behavior when considering their interpersonal behavior. This develops fear and anxiety within an individual because they may believe the recipient will interpret their compliment as insincere, cold, or negative. Anxiety is formed from the disproportionate fear of conversational dissatisfaction, or unrealistic amounts of conversation uneasiness fear (Sandstorm & Boothby, 2020). People's fear of conversational dissatisfaction leads them to underestimate the value of the interaction, but those who engage in conversations with strangers receive benefits and enjoyment from the interactions, despite initially fearing the conversation will be uninteresting and unenjoyable for both parties (Sandstorm & Boothby, 2020). Past researchers found that people underestimated the impact of their compliment on the recipient, believing that their compliment would make the individual feel displeased and less happy than it did, indicating that different types of stranger interactions presented a possibility of underestimation (Boothby & Bohns, 2020; Sandstorm & Boothby, 2020). The aim of our study was to explore the question related to

stranger interaction and compliment type. Does the compliment type itself have an impact on a compliment giver's perceived underestimation on a receiver?

Compliment giving is not studied as much as other forms of prosocial behavior such as helping and gratitude, therefore it is less understood (as seen in Boothby & Bohns, 2020). Zhao and Epley's (2021) research support the thesis that people tend to underestimate the positive impact of their compliments. However, individuals can overestimate or underestimate the positive and negative effects of their compliment if it has a romantic or sexual nature. In some cultures, people may accurately estimate, or even overestimate, the value of their compliment (Boothby & Bohns, 2020). Due to the lack of research on compliment giving, there is no substantial evidence regarding the impact of a specific compliment type such as physical appearance or attire compliments (Boothby & Bohns, 2020).

Unrealistic amounts of fear caused by conversational dissatisfaction can cause anxiety to arise within individuals, especially around specific conversational topics such as physical appearance and attire. This fear causes individuals to be worried about their competency in the explicit nature of the compliment, resulting in incorrect assumptions about the compliment effect (Boothby & Bohns, 2020). The competency of the compliment is important for the compliment receiver to fully understand the context and meaning attached to the compliment (Boothby & Bohns, 2020). Fear of incompetency can also lead to individuals being anxious about giving compliments due to violating social norms and fearing social judgment (Boothby & Bohns, 2020). Specifically, the fear of competency of different types of compliments often leads individuals to engage less in compliment giving. For example, a compliment giver may fear that the receiver believes their compliment may be sarcastic, or insincere. This level of fear can change depending on the type of compliment and the abandonment of social norms, which increases the amount people underestimate the positivity compliments have (Boothby & Bohns, 2020; Rees-Miller, 2011). Due to attire compliments being more socially acceptable, they are given more frequently, so people may feel appearance compliments are more genuine or thoughtful when they are received. However, past researchers have found that physical appearance compliments outweigh other compliment categories (e.g., personality) and result in an increased mood of, or positive influence on the compliment recipient compared to other compliment categories (Rees-Miller, 2011; Kahalon et al., 2018; Miles, 1994). Previous authors suggest that compliment type plays a larger role in the estimation and impact on both the compliment receiver and compliment giver (Zhao & Epley, 2021).

Boothby and Bohns (2020) focused on the underestimation of how a compliment would make an individual feel. An unanswered question to explore is whether specific compliment types play a role in the estimated value of the compliment. While previous researchers fo-

cused on the underestimation of all compliments, this current research focuses on the underestimation of the specific compliment types: attire and physical appearance (Boothby & Bohns, 2020). Using a conceptual replication of Boothby & Bohns (2020), it was hypothesized there will be an underestimation of the compliment value by the giver. In other words, the compliment receiver will report a greater impact of the compliment than the giver estimates. It was also hypothesized that participants (giver) would estimate an attire compliment (e.g., compliment on clothing) to have a less significant impact on the receiver than a physical appearance compliment (e.g., compliment on hair) due to previous research suggesting that physical appearance compliments are given less frequently. Due to the infrequency of physical appearance compliments, the compliment may have a larger impact on the receiver because they may perceive the giver to have gone out of their way to disobey social norms to give a more genuine compliment (Rees-Miller, 2011). Additionally, it was hypothesized that the underestimation would be greatest when a physical appearance compliment was given rather than an attire compliment. This interaction would be demonstrated in the level of underestimation from both the giver and receiver and the two compliment types by comparing the differences of underestimation of the two individuals shown in the data collected. We investigated these hypotheses by directing individuals in the engagement of compliment giving.

Method

Participants

Seventy participants (10 male, 60 female, age range = 18-22 years old, M_{age} =19) who attend a small, public university in Central Virginia participated in a mixed model experiment **(see Table 1)**. Each participant was randomly assigned to one of the two levels of compliments (attire or physical appearance). Of the 70 participants, 10 were excluded for failure to pass the manipulation check, which asked both the giver and receiver which compliment was given and received. Seven out of the ten participants were excluded for returning the receiver's surveys incomplete, while three out of the ten were excluded for failing to give the correct compliment type. Of the 60 participants included, 30 participants were assigned to each compliment level. Participants volunteered and signed up through the SONA experiment management system. We awarded one point toward course requirements or extra credit to participants.

Table 1. *The Number of Participants (by Gender Identification) Assigned to Each Compliment Type*

	Physical Appearance	Attire
Male	**4**	**6**
Female	**26**	**23**
Gender Fluid	**0**	**1**
Total	**30**	**30**

Note: The sample size originally collected consisted of 70 participants. We excluded 10 participants for failing to give the assigned compliment.

Procedure and Materials

Participants attended a study session that started in a lab. When the participants arrived for their chosen lab session time, they were instructed to sit down and read over a consent form. The participant number was randomly assigned to one of the two compliment type groups (attire or physical appearance) and the paperwork had the corresponding surveys, and instructions for the specific compliment. Detailed instructions were handed out which instructed participants to approach the fourth matched-gendered person they saw. The instructions included the type of compliment that the participant gave, which are "I like your shirt" for an attire compliment or "I like your hair" for a physical appearance compliment, as well as a designated location to separate participants. After the researchers finished reading the instructions, participants completed a pre-experiment survey, replicated from Boothby & Bohns (2020), to estimate how their interaction will make the receiver feel as well as demographic questions. The questionnaire consisted of 11 questions such as "To what extent will the person you approach enjoy this interaction," "How good will this person feel as a result of your interaction," "How pleased will this person feel as a result of your interaction," and "How flattered will this person feel as a result of your interaction?" Participants used a seven-point Likert scale (1 = *Not At All*, 7 = *Very/Very Much*) to respond to questions on the survey. The demographic questions consisted of three questions discussing the giver's age, gender, and ethnicity. We calculated the dependent variable, the compliment giver's level of underestima-

tion, by using questions one through four following Boothby & Bohns (2020) because they were determined to be the most valid. After running Cronbach's Alpha, we used the reliability statistic (α= 0.869) to determine that questions one through four on the pre-experiment questionnaire for both compliment givers and receivers mirrored one another and were used to interpret our three hypotheses. This was replicated through the Boothby & Bohns (2020) process, mimicking the procedure of their study on compliment types.

Next, researchers directed participants towards one of three various locations on the Longwood campus to complete the task of compliment giving, noted on their information packet. They had 10 minutes to give a compliment to the fourth matched gendered person they saw. If they ran into someone they knew or someone who was in a rush, participants started the counting process over again. After participants complimented the fourth matched-gendered person, they gave the individual an envelope containing a debriefing statement, explaining that the receiver partook in a senior seminar experiment on stranger interactions and asking them to fill out a questionnaire about how they felt about the interaction. The questionnaire consisted of eleven questions documenting their experience including questions such as "To what extent did you enjoy your interaction with the person who approached you" and "How much will what this person said to you influence your thoughts, opinions, or behavior once they walk away?" Receivers used a seven-point Likert scale (1 = *Not At All*, 7 = *Very/Very Much*) to respond to the survey. The questionnaire also asked the participant what compliment they received, if they knew the individual who gave them the compliment, and three demographic questions asking their gender, age, and ethnicity. If the stranger declined to fill out the questionnaire, participants were instructed to start the process over. After the receiver completed the questionnaire, the envelope was sealed and returned to the giver, who was then instructed to return to the lab.

Participants returned to the lab and the researchers instructed them to fill out a self-report post-experiment questionnaire consisting of four short answer questions such as "What did you compliment the stranger on," and "How do you think the receiver of your compliment felt after your interaction?" After returning the questionnaire, they were debriefed on what the experiment was studying, our predicted results, and how and when they could view results. The post-experiment questionnaire served as not only an additional form of manipulation check, but it also provided insight on the prosocial aspect of compliment giving. Compliment type, either physical appearance or attire, was used as an independent variable whereas the underestimation of a compliment, the dependent variable, was measured by looking at the mean sum of questions one through four on both the questionnaires for the compliment giver and receiver. Both the questionnaire given to the matched-gendered stranger and the

post-experiment questionnaire completed by the participant contained manipulation checks asking if the individuals knew each other and what compliment was given.

Results

We analyzed three hypotheses using a 2x2 mixed-model analysis of variance (ANOVA) with the underestimation of a compliment as a within-subjects factor and compliment type (physical appearance, attire) as a between-subject factor. Our first hypothesis was that the compliment giver will underestimate the value of their compliment, seen when the compliment receiver reports the compliment to have a greater value. The data supported the first hypothesis, $F(1, 58) = 68.64$, $p < 0.01$, $\eta_p^2 = 0.54$, such that receivers ($N = 30$, $M = 18.74$, $SD = 3.28$) reported the value of their compliment to be greater than the estimate of the compliment givers ($N = 30$, $M = 14.08$, $SD = 2.93$). However, the main effect of the compliment type was not significant $F(1, 58) = 1.89$, $p < 0.18$, $\eta_p^2 = 0.03$. The data did not support that the participants would report their compliment to have a less significant impact if it was an attire compliment ($M = 17.41$, $SD = 0.35$) compared to a physical appearance compliment ($M = 16.41$, $SD = 0.36$). For additional testing, an Independent Samples T-test was performed using the mean data from questions one through four on the survey given to the compliment givers. There were significant differences in underestimation shown by the compliment givers between physical appearance compliments ($M = 4.40$, $SD = 0.89$) and attire compliments ($M = 4.78$, $SD = 0.73$), $t(58) = -1.818$, $p < 0.001$ **(see Figure 2)**. This indicated that data supported that compliment givers underestimate the value of a given compliment. Finally, there was not a significant interaction between underestimation and compliment type $F(1, 58) = 0.97$, $p < 0.33$, $\eta_p^2 = 0.01$ **(see Figure 1)**. The third hypothesis was not supported, as underestimation was not dependent on compliment type.

Discussion

Prosocial behavior, including stranger interactions, increases well-being and feelings associated with positivity (Sun et al., 2019; Zhao & Epley, 2021). Even though this type of behavior increases well-being and is a simple way to exhibit prosocial behavior, the act of compliment giving is under-researched. More specifically, researchers have not examined the impact of compliment types and the difference and similarities of underestimation when it comes to physical appearance and attire compliments. The present conceptual replication of Boothby and Bohns (2020) adds to the importance for increased research on different compliment types and their impact on both the giver and receivers.

In this study, the results replicated the underestimation of a compliment's value as seen in Boothby & Bohns (2020). The compliment givers significantly underestimated the impact of

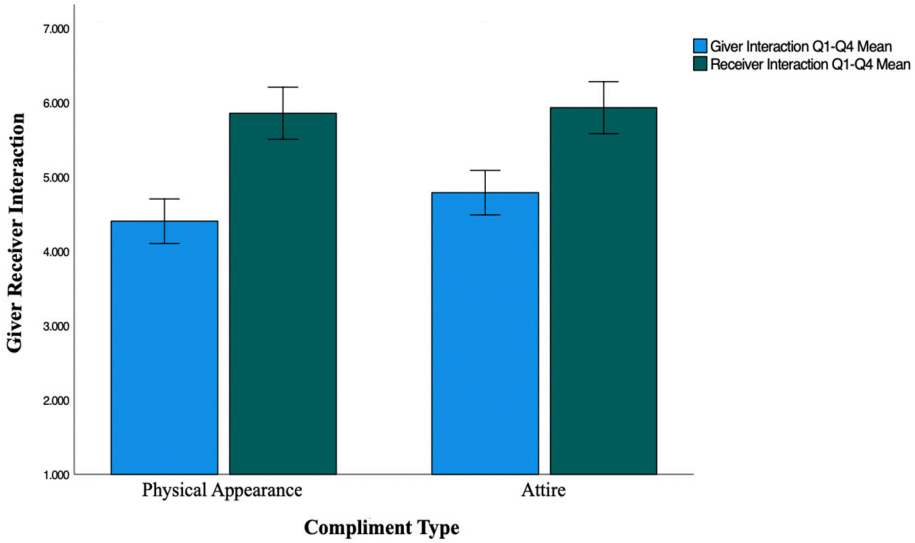

Figure 1. Estimated Compliment Value Based on Compliment Type. **Note:** *A Two-Way Mixed Measures ANOVA shows the underestimation of the compliment's value seen in both compliment types by the giver.*

their compliments on the receivers, resulting in a noteworthy underestimation gap between the two individuals. Contrary to our prediction, a significant interaction between the compliment types and the underestimation of a compliment's value by the compliment giver was not found. However, with future development of the study (e.g., improving methodology) and the recruitment of more participants, we think that there is a possibility for potential interaction.

It is important to reiterate that ten participants were excluded due to failed manipulation checks. Several participants failed to give their assigned compliment to the compliment receivers while others were excluded for returning the receiver's surveys incomplete. Improving the methodology to make the assigned compliment type clearer in the givers' instructions would decrease confusion among participants, thus increasing the likelihood of participants passing the manipulation check. Three of the participants were males assigned to the physical appearance compliment type, hinting at the possibility that male participants feared that the receiver would not fully comprehend the compliment and/or misinterpret the compliment's contextual meaning. This could be driven by the fear of violating social norms surrounding feminine and masculine gender norms (Boothby & Bohns, 2020). An emotional double-standard placed on males and females could also explain why male participants had an additional

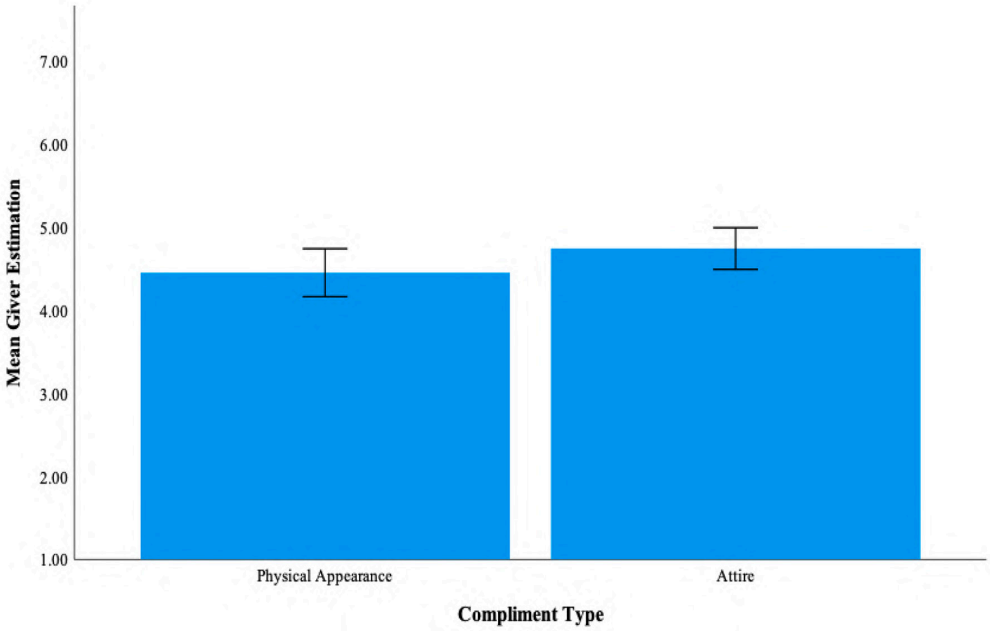

Figure 2. Giver's Mean Estimated Value of a Compliment. **Note:** *An Independent Samples T-Test shows the underestimation of the compliment's value seen in both compliment types by the giver.*

level of fear of violating gender norms (Milanowicz et al., 2017). The emotional double-standard is based on gender norms and stereotypes, providing a social hierarchy which states that women use emotions more compared to males. This could have been a reason that the participants we excluded were predominantly male because they feared showing emotions, specifically, towards other males. Again, showing emotions from one male to another could stem from the fear of violating social norms surrounding masculine behavior (Milanowicz et al., 2017). Moreover, based on the patterns from the participants who failed the manipulation checks, future researchers should explore the effect of gender in the underestimation of compliment type. Instead of having the compliment giver find and compliment a matched-gendered individual, compliment givers could find someone of the opposite gender. Research conducted by Holmes (1988) suggests that females give and receive more compliments than males do, which could further the understanding of the effect of gender roles in prosocial behavior. An additional direction that emphasizes the impact of gender includes the impact of different compliment types other than physical appearance and attire. Miles (1994) suggests that females are more likely to receive compliments based on physical appearance, while

males are more likely to be complimented on performance or accomplishments. Based on this finding, if the compliment type was changed and gender was added as a variable, then the likelihood for interaction would increase because the additional factor of different gender sociability would be added. Again, this would lead to a greater understanding of the impact that gender plays in the prosocial behavior of compliment giving and receiving.

Additionally, we had a smaller sample size than originally expected. While the sample size was sufficient to complete a conceptual replication, we believe that with more participants the possibility for interaction between compliment type and the underestimation of a compliment's value increases. It is also important to note that the characteristics of our sample are not applicable to all subsets of populations, as our study was based on a predominantly female campus. Although, these findings would be applicable to college students in a campus setting, or public settings (e.g., gendered sporting events, same-sex locker rooms, and same-sex restrooms) where the gender of the individual is predominant. In different environments (e.g., a bar) individuals tend to overestimate their compliment on the receiver (Boothby & Bohns, 2020). Different groups also place different values or norms on compliments and compliment-giving and receiving implying, again, that context plays a key role in the estimation of compliments (Boothby & Bohns, 2020). For instance, this study only looked at college-aged students. If this study were to be replicated in a setting with older adults, then the possibility of underestimation may be different considering the sociability and values of their age group (Boothby & Bohns, 2020). Older adults seek out more prosocial behavior compared to younger adults, and they have a lower self-favoring bias, thus, they do not consider their own feelings and perceptions when engaging in behaviors such as compliment giving (Lockwood et al., 2021). Since older adults are less self-motivated and more motivated by others, they are less likely to consider their own perspective which decreases the chances of them reporting underestimation of their behaviors (Lockwood et al., 2021). Together, this suggests that location and age are external variables and should be considered in future research.

Additional future research can explore whether compliment type plays a role in the underestimation of a compliment's value through a larger sample size. Statistics from the analysis implied that a bigger sample size would have increased our small statistical power (0.144) and could have potentially created a significant interaction. Future research should increase to 100 or more to reach a larger power size to properly replicate Boothby & Bohns (2020). Although engaging in prosocial behavior may be anxiety-inducing and compliment givers believe their compliment to have less value on the receiver, compliment giving can lead to an increase in positive mood of both compliment giver and receiver. The underestimation of a compliment's value found in Boothby and Bohns (2020) was successfully replicated. Adding

on two different compliment types to the original study probes the idea that there could be an interaction between compliment type and the underestimation of a compliment's value. This would further the understanding of compliment giving, and why society values certain compliments over others.

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The Imperial Japanese Military: A New Identity in the 20th Century, 1853–1922

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Abstract

The arrival of Commodore Matthew Perry in 1853, ended Japan's isolation from the West. Perry's arrival was a warning to the Japanese leaders that they needed to industrialize and modernize the military to protect the country's interests. In 1868, the Meiji Restoration took over Japan. Its leaders strove to create an industrialized nation with a powerful military to aid its expansionist desires. The reconstruction of the Japanese military during the Meiji Restoration gave Japan repeated combat success allowing the Japanese government to achieve its strategic and expansionist goals and develop a militaristic identity that rapidly spread throughout the early part of the twentieth century. Modeling the new military after Western powers, Japan created western alliances and new policies within the empire, including the indoctrination of the education system. During the period before World War I, Japan fought in two wars: the Sino-Japanese War and the Russo-Japanese War. The main goal of both conflicts was an improvement in military power and expansion. Japan's military power grew with the victory over Russia and the invasion of Korea. Entering World War I on behalf of the Allies, Japan was given the opportunity to prove its military abilities as well as complete its expansionist missions like Hokushin-ron *and* Nanshin-ron*. Battles like the Siege of Qingdao showcased both the army and the navy's capabilities in modern warfare. After World War I, unfair treatment in the Paris Peace Conference and the Washington Naval Conference ultimately pushed Japan away from the Allied West and to the Axis Powers in the 1940s.*

TIMELINE[1]

1853 – Matthew Perry arrives in Japan

1868 – Meiji Restoration

1894–95 – Sino-Japanese War

1895 – Triple Intervention

1902 – First Anglo-Japanese Alliance

1904–05 – Russo-Japanese War

1905 – Second Anglo-Japanese Alliance

1907 – Japan and United States Entente

1911 – Third Anglo-Japanese Alliance

1914 – Beginning of World War One

1914 – Japan takes Tsingtao Peninsula

1915 – Japan captures Micronesia

1915 – Japan sends Twenty-One demands to China and receives a response

1917 – Japan's fleets sent to the Mediterranean Sea.

1919 – Treaty of Versailles

1922 – Washington Naval Conference

[1] Leonard S. Kosakowski, "The Anglo Japanese Alliance, and Japanese Expansionism: 1902–1923," (Master's Thesis, University of Maryland College Park, Maryland, 1992): https://apps.dtic.mil/dtic/tr/fulltext/u2/a258516.pdf.

Until the arrival of an American fleet led by Commodore Matthew Perry, in the Bay of Edo on July 8, 1853, Japan was an isolated country. Perry gave Japan an ultimatum; open the trading ports or be met with force.[2] The Japanese responded by opening the Hakodate and Shimoda ports to the United States, ending isolation for the first time in two hundred and twenty years since trading with the Chinese. Diplomatic negotiations between Japan and the United States were resolved in the Treaty of Kanagawa in 1854, near the end of the Tokugawa shogunate.[3] Japanese leaders soon recognized the need for a new military modeled after Western powers. The reconstruction of the Japanese military during the Meiji Restoration allowed Japan to take a prominent role during the era of imperialism and the First World War (1914–1918). The creation of the Imperial military and its repeated combat success, allowed the Japanese government to achieve strategic and expansionist goals while developing a militaristic identity that rapidly spread throughout the twentieth century.

Before Perry's arrival, during Japan's isolationist period, known as *sokou*, the main military force in the country was the samurai—the aristocratic warriors of pre-industrialized Japan. The samurai held political power and belong to their own caste. The local *daimyo* lords, who held land in the feudal era, hired the samurai for protection, for intimidation, and the opportunity to grab power. The *daimyo* used the samurai to help compete against each other for economic and military success. The samurai were key players in the rise of the shogunate, an early military dictatorship that dominated the Japanese emperor and government. This was known as the Warring States period under the Ashikaga Shogunate, which prevented Japan from growing and developing like the West. The arrival of the American Navy in 1853 introduced new weapons and religions to Japan, which challenged the existing social, political, and military structures.

The introduction of firearms and Christianity came at a controlled rate within the island, but soon the number of firearms significantly increased. The samurai were not permitted to use firearms because they were considered immoral under the Code of Bushido, the foundation and moral constitution of the samurai's life. If one did not abide by the code, they were seen as dishonorable and swiftly held accountable for their actions. Japan saw temporary peace under the Tokugawa era (1603–1867), the final traditional period of Japanese society. However, by 1868, the arms race exploded in Japan with the importation of more than 100,000 Western weapons, making Western involvement impossible to ignore.

Compared to the West, Japan's military was weak; Perry's arrival was a warning to the Jap-

[2] Matthew Calbraith Perry, *The Americans in Japan: An Abridgment of the Government Narrative of the U.S. Expedition to Japan, Under Commodore Perry* (New York: Appleton and Company, 1857), 146.

[3] *The Treaty of Kanagwa*, United States National Archives. Accessed December 1, 2021.

anese leaders that they needed to industrialize and modernize the military in order to protect the country's interests. The failure to industrialize and provide a strong national military led to coup d'état against the Tokugawa Shogunate, which removed the feudal system and replaced it with the previous system of imperial rule. Then in 1868, the Meiji Restoration took over Japan. Its leaders strove to create an industrialized nation with a powerful military to aid its expansionist desires. Emperor Meiji insured change and, in 1889, Japan drafted its first constitution. The document called for the creation of a European-based parliament referred to as the Diet.[4] The constitution was written by Japan's first Prime Minster Ito Hirobumi (1841–1909), who advocated for a new government system which reformed the country through the reconstruction of education, industry, and the military.

Perry's arrival highlighted the danger the Japanese were in because of their inadequate military for defense so the emperor made military development as his top priority. Cathryn Morette, in "Technological Diffusion in Early-Meiji Naval Development, 1880–1895," writes "this new government placed priority on the strength of the military under the concept *Fukoku kyōhei*, meaning to 'enrich the country, strengthen the army.'"[5] Japanese society and its military went through three phases of modernization. The beginning phase, which started in 1853 and lasted until 1870, was the period of realization and experimentation.[6] To provide the funds for military improvements, the Japanese government invested in private companies such as Mitsubishi, Mitsui, and Sumitomo and funds were used to finance a large shipbuilding program similar to the West.[7] The second phase lasted from 1870 until 1878, when the Meiji government established a model organizing the army and the navy, completely transforming them into a strong fighting force while focusing on the internal structure of the respective branches. The final phase lasted from 1878 until 1890.[8] During this phase, the military responded and adapted to the political climate of Japan, allowing an increase in the military's effectiveness.

The Imperial military played a major role in Japanese expansion and the development of militarism within the country. Japan's reconstruction of the military during the nineteenth and early twentieth centuries started with hiring some of the top advisors from Western nations.

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[4] Shunsake Sumikawa, "The Meiji Restoration: Roots of Modern Japan," Lehigh University, 1999, 5.

[5] Cathryn Morette, "Technological Diffusion in Early-Meiji Naval Development, 1880–1895," in *The Age of Gunpowder: An Era of Technological, Tactical, Strategic, and Leadership Innovations,* Emory Endeavors in History 5 (2013), 205–227 at 211.

[6] Sumikawa, "The Meiji Restoration," 5–6.

[7] Ibid., 6.

[8] Ibid., 6.

The army was modeled after the Prussian military and the navy after the British. During World War I (1914–1918) the Japanese army became an active fighting force in Serbia and China on behalf of the allies, while the navy played a large role in the Pacific and the Mediterranean. In the aftermath of the First World War, the Japanese military made inroads in Asia and the Pacific. The army supported the ideology of *Hokushin-ron*, the "Northern Expansion Doctrine." This was the Imperial army's goal for territorial and economic expansion for the empire, the opposite of *Nanshin-ron*, "the Southern Expansion Document," supported by the navy. The respective branches are responsible for Japan's repeated combat success and expansionistic endeavors. Each branch of the Japanese military had the constant goal of becoming a global empire and developing a new militaristic identity.[9]

Education was modeled after the western systems. The goal for the new system was to indoctrinate the youth with the new government's agenda and desires. A compulsory education system was put in place, "after about one or two decades of intensive westernization, a revival of conservative and nationalistic feelings took place. Principles of Confucianism and Shinto, including the worship of the emperor, and were increasingly emphasized at educational institutions."[10] Japanese students participated in study abroad programs in exchange for western educators coming to Japan to teach. Western scholars taught students subjects like math, science, and later military strategy, teaching in military schools and training the military in combat strategies including the operation of modern machinery.[11] To raise money for education and military reforms, Meiji began to industrialize. Contrary to the Tokugawa era which was primarily agriculture-based, Meiji introduced a new banking and transportation system. The new industrialization was aided by the creation of the railroad and communication networks.[12] The railroad brought individuals from the rural areas into cities like Tokyo to work in new industries.

The Meiji Restoration brought a new era for Japan's military by ending the samurai system through the creation of a National Army by uniting the Satsuma, Chōshū, and Tosa Clans. Perry's arrival forced Meiji to move towards ending feudalism through the establishment of an Imperial army by Japanese military advisor Ōmura Masujirō (1824–1869) who aided in the centralization of the clans.[13] The samurai either joined the new army or often formed national-

[9] Hajime Shimizu, "Nanshinron: Its Turning Point In World War 1," *The Developing Economies* XXV.4 (December 1987): 386–402 at 386.

[10] Sumikawa, "The Meiji Restoration," 8.

[11] Ibid., 8.

[12] Ibid., 9.

[13] Ibid., 10.

istic groups with the aim of overthrowing the new military. In the 1870s, the army succeeded in ending multiple samurai rebellions, the most notable of which was the Saigo Rebellion (Jan 29, 1877–Sep 24, 1877).

To further advance the new military, Japanese advisors toured the world. They took meticulous notes on the governmental structures in countries like the United States and Great Britain. Notes on western military formations and technology gave Japan a strategic advantage. Japan now knew the military and economic strength of potential enemies and began to build accordingly. Japan observed the army tactics of the West while analyzing the result of the Franco-Prussian War. Ōmura advised the emperor to study western military tactics and theories, focusing on the French and Prussians. By taking Prussian tactics, they began to implement them into training, which included land assaults and modern weaponry. After establishing Western schools for the army, Meiji focused on creating a powerful navy.

Japan looked towards Great Britain for inspiration due to its naval superiority during the nineteenth century. They reached out to the British for a base model to build upon and in 1873, the British advisors arrived to develop an advanced navy for the Japanese, establishing naval schools in areas like Tokyo and Tsukiji where they also taught. British officers, "educated the Japanese navy technologically and transformed the navy into a legitimate fighting force, by introducing concepts including blockade, counter-battery fire, and tactics for modern steamships."[14] This new navy was called *Nihon Kaigun*, "Imperial Japanese Navy," and included battleships, submarines, cruisers, and destroyers. These schools provided instruction to the Japanese naval leaders who fought in World War I along with the Allies. The navy eventually developed into a nearly autonomous institution, often rivaling the army with its political influence. The Japanese military developed greatly and was deployed several times during the era between the Restoration and World War I.

During the period before World War I, Japan fought in two wars: the Sino-Japanese War and the Russo-Japanese War. The main goal of both conflicts was military power and expansion. In the Sino-Japanese War (1894–1895), Japan was successful in its conflict with China over the Korean peninsula. The war demonstrated the contrast between China's pre-modern military and Japan's new modernized military. Victorious, Japan claimed Korea as an addition to the new empire. The Treaty of Shimonoseki ended the Sino-Japanese War and Japan's defeat of the Qing Dynasty shifted East Asian dominance from China to Japan.[15] This treaty was seen as too harsh by western powers with interests in China—France, Germany, and Rus-

[14] Morette, "Technological Diffusion," 213.

[15] *Treaty of Shimonoseki*, University of Southern California US-China Institute, https://china.usc.edu/treaty-shimonoseki-1895.

sia—who intervened in an alliance known as the Triple Intervention. Its goal was stop Japanese expansion in the Pacific and it required Japan to return the Liaotung Peninsula after their victory in the Sino-Japanese War.[16] Russia's involvement in the Triple Intervention was one of the causes of the In the Russo-Japanese War (1904–1905) because Russia moved its troops into Port Arthur, Manchuria.

During the time between the Sino-Japanese War and the Russo-Japanese War, the Japanese rapidly industrialized their technology, economy, and built alliances. In 1902, the Anglo-Japanese Alliance was created with Great Britain in response to Russia's growing presence in China and the Triple Intervention insistence that Japan to return the Liaotung Peninsula.[17] Great Britain found the Triple Intervention's actions unnecessary and feared Russian expansion. The aim of the Alliance was to "protect British interests in China, fend off the strategic implications for European diplomacy of an imbalance of power in China, and maintain naval superiority in Asian waters."[18] In 1904, when Japan declared war on Russia over hostilities in Manchuria, Great Britain abided by the alliance and prevented any other Western powers from joining the conflict. During the Russo-Japanese War, the newly-created Japanese navy won one of the biggest battles at Tsushima Strait. The Imperial army mobilized over a million men and played a large role in defeating the Russian army in Manchuria. The war ended with the Treaty of Portsmouth, negotiated with the help of the American government, which gave control of the Korean peninsula and southern Manchuria back to the Japanese. With Japan's victory over Russia, the seed of militarism began to spread within the empire.

After these wars, the government maintained strong western ties and the new Japanese government kept in contact with the British government, holding them as close allies. The second version of the Anglo-Japanese Alliance was signed in London on August 12, 1905.[19] Great Britain recognized Japan's ambitions through East Asian expansion.[20] The last Anglo-Japanese treaty was signed in 1911 to protect against threats from Germany which was gaining military strength.[21]

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[16] Kosakowski, "The Anglo Japanese Alliance," 6–11.

[17] アジア歴史資料センタ, "The Anglo-Japanese Alliance 1902," Japan Center for Asian Historical Records: https://www.jacar.go.jp/nichiro/uk-japan.htm. Accessed March 10, 2021.

[18] Kosakowski, "The Anglo Japanese Alliance," 21.

[19] *Treaty of Anglo-Japanese Alliance of 1905*, Theodore Roosevelt Papers, Library of Congress Manuscript Division:https://www.theodorerooseveltcenter.org/Research/Digital-Library/Record?libID=o280087. Accessed March 11, 2021.

[20] *Anglo-Japanese Alliance 1911,* The World and Japan Database, Database of Japanese Politics and International Relations, The University of Tokyo: https://worldjpn.grips.ac.jp/documents/texts/pw/19110713.T1E.html. Accessed March 11, 2021.

[21] Ibid., 28.

In the years leading up to 1914, tensions in Europe increased with the rise of Germany and the Central Powers. Japan and Great Britain continued the 1911 Anglo-Japanese Alliance, preparing for a world war. After Germany invaded neutral Belgium on August 4, 1914, Great Britain declared war. Japan entered into World War I in August 23, 1914, due to the Anglo-Japanese Alliance's effort against the German presence in the Pacific. The Alliance put them on the side of the British, France, Russians, and later the United States. When the fighting began in 1914, the Japanese recognized the German presence in Shantung Peninsula, which included the area of Qingdao. Originally, Japan was to remain neutral but when the British colony in China was attacked by the Germans, the Japanese were called upon.

Prior to 1914, the Japanese had spent significant funds developing the military so it could compete with the other world powers on the global stage.[22] The army received more funding during the Sino-Japanese War, the Russo-Japanese War, and World War I for weapons like the Murata rifle, known as the Arisaka Type 30 and 38.[23] Funding also went towards horses and cavalry equipment, including rifles like the 1912 Arisaka Type 44 Cavalry Rifle. The army established an air service which consisted of imported military-grade aircraft, including a "Bleriot, a Wright, a Grade, and a Farman."[24] The Japanese Navy used the additional funding to improve and modernize their battleships, building new destroyers and battlecruisers but focusing on dreadnoughts—large new battleships modeled after the Royal Navy's *HMS Dreadnought*.[25] The Japanese used the ships for combat and transport missions in the Mediterranean. The original budget included funding to build seven dreadnoughts at ¥352 million, but was eventually reduced to five dreadnoughts.[26] Before 1915, the Japanese added two additional dreadnoughts, the *Kawachi* and *Settsu* which could fire 18–23-inch torpedoes.[27] Altogether, the Imperial Navy consisted of around ninety-five cruisers and destroyers. Combined, these ships carried large weapons and were designed for speed. Japan's naval engineering advancements also included using the first aircraft carrier in the Siege of Shantung Peninsula to access Qingdao in 1914. During WWI, destroyers were extremely beneficial to the Japanese

[22] J. Charles Schencking, *Making Waves: Politics, Propaganda, and the Emergence of the Imperial Japanese Navy, 1868-1922* (Stanford, CA: Stanford University Press, 2005), 185.

[23] "World War One Japanese Infantry Arms: Military History in the Great War," *Military Factory*: https://www.militaryfactory.com/smallarms/ww1-japanese-guns.php.

[24] Meirion Harries and Susie Harries, *Soldiers of the Sun: The Rise and Fall of the Imperial Army* (New York: Random House, 1991), 112.

[25] "World War 1: Imperial Japanese Navy," *Navy History.Net:* https://www.naval-history.net/WW1NavyJapanese.htm. Accessed March 11, 2021.

[26] Ibid.

[27] Ibid.

and the Allies for land expansion and protection. The Imperial Navy also built around twelve submarines which could patrol areas in both the Pacific and the Mediterranean. The Japanese did not have the largest military compared to the rest of the world, but they made significant contributions to Allied protection and German removal. During World War I, both the army and navy were used and in the battle of Qingdao (also known as the Siege of Tsingtao), despite their rivalry and competition for funds, they worked together. They were responsible for Japan's repeated combat success and large expansionistic claims.

Japan used the war to continue its expansionist goals within the Pacific. According to Fredrick R. Dickson in *War and National Reinvention: Japan in the Great War*, "The Naval General Staff adopted a plan of operation for the Japan Sea, two days after Germany declared war on Russia on August 1st, 1914. The draft included a plan to attack in concert with the army, the enemy base at Qingdao for the purpose [removing] Germany's power in Asia and eliminating its ambitions."[28] Germany had tried to create a "model colony" of Qingdao within the Shantung Peninsula and was expanding its influence in Asia. Germany had a 99-year lease on the port of Tsingtao and started building fortifications within the province. Seeing this military build-up, Japan submitted a list of demands before they declared war requiring Germany to remove its warships from the Pacific and transfer control of the port to Japan. When the Germans declined, Japanese forces were ordered to take the port by force. The British Royal Navy assisted the Imperial Navy in surrounding the port with colonial troops. The Japanese army deployed 20,000 troops with 140 pieces of artillery.[29]

The Japanese were the first to land troops on September 2, cutting off the German's access to the mainland. In *The Anglo Japanese Alliance and Japanese Expansionism*, Leonard S. Kosakowski describes the British and Japanese bombing the "Kiaochow wireless station, electric power station, and the German ships in the harbor. Meanwhile, the Japanese captured the Kiaochow railway station placing them twenty-two miles from Tsingtao."[30] During the siege, Japanese army officers "had sent messages into the [German] garrison, wishing their German friends and former tutors luck and safety during the siege."[31] This caused tensions between the Allied troop; the British feared that the Japanese sympathized with the Germans. Despite this, the Japanese successfully captured the port, ending the siege on November 7, 1914. "A History by the Official Army Museum," describes the tactics used in September and

[28] Fredrick R. Dickson, *War and National Reinvention: Japan in the Great War, 1914–1919* (Cambridge, MA: Harvard University Press), 73.

[29] "Siege of Tsingtao," National Army Museum. Accessed March 11, 2021.

[30] Kosakowski, "The Anglo Japanese Alliance," 85.

[31] Harries and Harries, *Soldiers of the Sun*, 110.

November of 1914, during the Siege of Tsingtao: "The Japanese commander, General Kamio Mitsuomi, had undertaken night raids and avoided the costly frontal attacks of the type seen in the early battles on the Western Front. Rather than waste men, he used his heavy howitzers to soften up the enemy while gradually advancing his trenches."[32] The Battle of Qingdao was one of the only major Pacific campaigns of World War I.

The victory at Qingdao contributed significantly to the war because it removed German influence from Asia, as well as removing the potential threat of Russia having to fight a multifront war if the Germans invaded through China. Subsequently, Japan, under Prime Minister Ōkuma Shigenobu, sent the "Twenty-One Demands" to China on May 7, 1915 to take advantage of expansion and Japanese dominance, a major diplomatic initiative by the growing country.[33] The demands included the complete removal of German influence and troops within China. Japan was to be given complete political and economic dominance over Manchuria. China would be required to use Japanese advisors within the government and purchase weapons from Japan. On May 8, China accepted the Twenty-One Demands, allowing for Japanese territorial expansion. This angered the United States because it already had an Open-Door Policy in place with China.[34] The United States viewed China as an "economic opportunity for all, without compromising China's territorial integrity."[35] To keep the peace between the two imperialistic nations, Japan gave into the wishes of the United States and allowed an American economic presence in China: "In return, Americans would show a marked preference for China, and the defense of Chinese interests by President Wilson and Secretary of State William Jennings Bryan."[36] This later became an issue at the Paris Peace Conference in 1919, demonstrating increasing tensions between Japan and the United States.

While the Japanese government handled new international tensions with the United States, the military shifted focus towards combat in the Pacific. During WWI, the Germans had warships in an area known as Micronesia, off the coast of modern-day Guam and Indonesia. Great Britain asked the Japanese to send the *Nankenshitai*, "the South Sea Squadron," to destroy the German warships. A telegram sent from Singapore to the Japanese Admiralty on September 18, 1914, reported sightings of German merchant ships and German cruisers

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[32] "Siege of Tsingtao."

[33] Japanese Government, "Twenty-One Demands," University of Southern California, US-China Institute: https://china.usc.edu/japanese-government-"twenty-one-demands"-April-26-1915. Accessed March 11, 2021.

[34] Ibid.

[35] Harries and Harries, *Solders of the Sun*, 105.

[36] Ibid., 115.

around the surrounding islands.[37] When the Japanese reached Micronesia there were no military vessels; the German military had left so Japanese kept the islands as a prize. This allowed the Japanese to continue their military dominance and expansionist policies during the war, gaining a new imperialist identity. These Japanese successes fueled the growing ideology of militarism within government and society.

In February 1915, the Japanese military aided the British Fifth Light Infantry in putting down a mutiny in Singapore. Cruisers filled with French and Japanese troops arrived and suppressed the mutiny with heavy artillery.[38] This significantly helped the British keep control over one of their colonies during the war. The Japanese military maintained a strong presence in Asia and the Pacific, so the Allies asked the Japanese to start taking over naval patrols. Because of their reputation for success in defending Pacific colonies, Great Britain asked for naval assistance in the Mediterranean in March 1917. The Japanese fleets arrived in April 1917 to protect the Allies' warships and commerce vessels from submarine threats. Unauthorized submarine warfare by the Central Powers was a major issue for the Allies. On April 13, 1917, "Rear-Admiral Satō Kōzō arrived with the Second Special Squadron in Malta, the headquarters of the Royal Navy's Mediterranean Fleet."[39] The Second Squadron consisted of seventeen cruiser and destroyer spread across the Mediterranean.[40] This deployment left the First Squadron to patrol areas in the Pacific. The Allies became dependent on Japanese protection when transporting troops, artillery, and goods across popular shipping routes linking the major countries during the war.

The Second Squadron played a significant role in the aiding the passengers on the British passenger vessel the *SS Transylvania*. On March 5, 1917, the ship, transporting troops, was hit with a torpedo from a German U-boat. Two Japanese destroyers, the *Matsu* and *Sakaki*, aided in the rescue of 3,300 passengers and crew, though the *Transylvania* sank within the hour with a loss of two hundred lives.[41] Without the Japanese help, thousands of additional lives would have been lost. During Japan's time working with the Royal Navy in the Mediterranean, they

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[37] *Folio 578: Telegram from Singapore to Admiralty 16th September 1914,* The National Archives, United Kingdom: https://discovery.nationalarchives.gov.uk/details/r/C12783792. Accessed March 10, 2021

[38] Karen A. Snow, "Russia and the 1915 Indian Mutiny in Singapore," *South East Asia Research*, Vol. 5, No. 3 (November 1997): 295–315 at 295: https://www.jstor.org/stable/23746948?seq=2#metadata_info_tab_contents.

[39] "Warfare 1914–1918 (Japan)," New Articles RSS: https://encyclopedia.1914-1918-online.net/article/warfare_19. Accessed March 11, 2021.

[40] Ibid.

[41] "Transylvania Passengership (1914–1917)," *Wreaksite*: https://wrecksite.eu/wreck.aspx?37314. Accessed March 11, 2021.

developed effective anti-submarine tactics and established a honorable relationship with the Allies.

The Japanese were highly praised and respected for their efficiency in safely escorting Allied ships. "History of Japan's Warfare 1914–1918" notes that this protection led to a dependent relationship within the Mediterranean with the Allies and the Japanese:

> During their deployment in the Mediterranean, the Japanese escorted twenty-one British warships and more than 700 Allied transport ships, which altogether carried more than 500,000 passengers and sailors. More than 7,000 crew members and passengers who would otherwise have been casualties of submarine attacks owed their lives to Japanese rescue missions.[42]

According to historian Timothy D. Saxon, prior to Japan's arrival in the Mediterranean, "3,096,109 tons [of Allied shipping] fell prey to mines and submarines," which cost the Allies thousands of dollars.[43] The Japanese navy remained in the Mediterranean until the end of the war in 1918, suffering far fewer losses than their Allied counterparts. With a total mobilization of 800,000 troops, Japan suffered only 300 battle deaths and 907 wounded, compared to Great Britain's mobilization of 8,900,000 troops and death toll of 900,000.[44] Japan lost only five naval ships during its time in the war, and added thirty-seven vessels throughout the four years, making the losses insignificant.[45]

The Paris Peace Conference was held in 1919 to formally end World War I. The Japanese sent Prime Minister Saionji Kinmochi and an additional delegation. Japan sat with the Allies and made secret arrangements with Great Britain to split Germany's Pacific Islands. In the Treaty of Versailles, Japan acquired the Shantung Peninsula and the islands of Micronesia that were placed under the South Sea Mandate by the League of Nations. The new mandate system authorized Japan to occupy these territories temporarily but in reality, the islands were swiftly added to the Japanese empire, completing their goal of *Nanshin-ron*.[46] However, Japan did not receive everything that was promised. There was still favoritism among the other Allied nations and sympathy towards China. Japan significantly benefited from the conference but Japanese nationalists believed that the Western powers strayed from the original promised terms.

The new mandates were treated as colonial possessions despite the wishes of the League

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[42] "Warfare 1914–1918 (Japan)."

[43] Timothy D. Saxon, "Anglo-Japanese Naval Cooperation 1914–1918," *Naval War College Review*, Vol. 53, No. 1, Article 4 (2000): https://digital-commons.usnwc.edu/nwc-review/vol53/iss1/4/.

[44] Ibid., 101.

[45] "World War 1: Imperial Japanese Navy."

[46] Shimizu, "Nanshinron," 389.

of Nations. The Japanese regularly implemented reforms on their new possessions, requiring the population of the mandated islands to be educated and learn Japanese. The islands were transformed for economic profit with the mining for phosphates and the development of sugar plantations. The islands, referred to as the "Gibraltar of the Pacific," were also heavily militarized with the Japanese navy having the largest presence. The islands also had military bases on which troops of the Imperial Army were stationed. Constant defensive patrolling made the Japanese the dominant force within the Pacific, cementing its national identity as a dominant military power.

With a new identity as a dominant force in East Asia, the ideology of militarism spread rapidly within the government and continued until the 1940s. Japan left World War I internationally and domestically powerful, gaining the resource-rich provinces along with Western trading alliances and becoming one of the richest nations in the early twentieth century. This increase in wealth would be used to improve the Imperial military, making it even larger and more dominant than before.

Since Japan had a large military and political dominance in the Pacific, the Allies requested help in the suppression of the Bolsheviks in the Siberian Intervention (1918–1922). The goal of the intervention was to stop the spread of the Bolshevik ideology and the creation of the Soviet Union. President Woodrow Wilson asked the Japanese government to supply troops along with Great Britain, France, and the United States to support the White Russians. The army sent 70,000 troops on behalf of the Allies; the majority of the fighting occurred in Siberia, Mongolia, and the border countries of Russia. Allied operations fell under the command of Kikuzo Otani, which then gave the Japanese army a great deal of power. The intervention affected the Japanese domestically and internationally; internal politics advocated for troop removal while international allies wanted the Japanese to stay in Siberia.[47] Eventually the Japanese ended the intervention and removed troops in 1922, with an estimated 3,000 casualties from combat and disease.[48] Despite the Japanese military efforts on behalf of the Allies, Washington D.C. feared their rapid expansion and growing power.

In 1921, the American government hosted the Washington Naval Conference, which took place to address concerns over Japan's rapid military expansion. The products of the conference were the Five-Power Treaty, the Four-Power Treaty, and the Nine-Power Treaty all established by the United States, Great Britain, Italy, France, and Japan to reduce naval size

[47] "Origin of Siberian Intervention, 1917–1918," *The Annals of the Hitotsubashi Academy*, Vol. 9, No. 1 (October 1958): 97–108.

[48] Ibid.

and relieve tensions in East Asia. The Five-Power treaty mandated a 5:5:3 naval tonnage limit, requiring a reduction in the size of Japanese navy to a 300,000-ton limit and requiring them to stop building. The Japanese reluctantly accepted this in exchange for a promise from the British and the United States not to fortify their territories and bases in the Pacific. The only exception was made for Hawaii where The U.S. had constant military enhancements. The treaty was seen as a national success in limiting Japan's navy and preventing future altercations in the Pacific.[49] The Four-Power treaty replaced the 1902 Anglo-Japanese Alliance. It was agreed that any tensions or potential conflict in the Pacific would be resolved by diplomatic meeting. The Nine-Power Treaty recognized Japanese dominance in Manchuria but required equal opportunity for business in China. Both Great Britain and the United States continued to participate in commerce with China through Open Door Polices.[50] As a result of the conference, the Japanese lost the Province of Shantung and other colonial holdings in China, which they had gained during World War I. According to the Japanese, their army had gained the territory through hard work and sacrifice. As a consequence, Japan reduced relationships with Great Britain, United States, and France because it felt it had been unfairly treated at the Paris Peace Conference and the Washington Naval Conference. This further isolated the Japanese.

Overall, the reconstruction of the Japanese military during the Meiji Restoration allowed Japan to occupy a prominent role during World War I. The creation of the Imperial military and repeated combat success enabled the Japanese government to achieve its strategic and expansionist goals and develop a militaristic identity that rapidly spread throughout the early part of the twentieth century. Through the advancements in Western naval technology, Japan created western alliances and new policies within the empire, including industrialization and the indoctrination of the education system which allowed governmental changes to flow smoothly. In the early twentieth century, Japan's military power grew with the victory over Russia and the invasion of Korea. Entering World War I on behalf of the Allies, Japan was given the opportunity to prove its military abilities as well as complete its expansionist missions like *Hokushin-ron* and *Nanshin-ron*. Battles like the Siege of Qingdao showcased both the army and the navy's capabilities in modern warfare. The Allies recognized the success and used Japan's military strength in the Mediterranean and in Siberia. After the war, the Japanese government led with a militaristic hand in economics, education, and politics. The grievances over

[49] "Washington Conference," *Milestones in the History of U.S. Foreign Relations*, Office of the Historian Foreign Service Institute, United States Department of State: https://history.state.gov/milestones /1921-1936/naval-conference. Accessed March 11, 2021.

[50] Ibid.

the treatment of Japan at the Paris Peace Conference and the Washington Naval Conference caused an aggressive swell in militarism within the government. Nationalists gained more political power and adopted stricter anti-western sentiments within government policies. The mandated reduction of the Imperial Navy caused the decrease of Western alliances, further isolating the Japanese. Japan would continue to gain power and spread militarism through their Pacific colonial holdings. By the 1940s Japan created alliances with the Axis Powers, in retaliation to the west's goal to suppress Japanese expansion and, on Dec. 7, 1941, bombed Pearl Harbor in Hawaii, officially engaging the United States in the second World War.

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Longwood University's Campus: Human-cultivated Soil has Higher Microbial Diversity than Soil Collected from Wild Sites

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Awarded first place Natural Sciences paper

Abstract

Soil microbiomes play a vital role in several global biogeochemical cycles. One factor known to affect the diversity and composition of soil microbes is soil pH. The most microbial diversity is generally found in soils with close to neutral pH. In this study, soil samples were collected from two human-cultivated sites and two wild sites on Longwood University's campus. The human-cultivated sites are managed under a state nutrient-management fertilization plan which emphasizes low nitrogen fertilizers, composted soil, and careful maintenance of a stable pH just below neutral. Bacteria were cultured from each of the four soil samples on nutrient-broth agar plates, and the 16s rRNA gene was amplified from a representative colony of each location and sent for DNA sequencing via the Sanger method. The microbial diversity of the four sites was measured based on visual analysis of bacterial colony characteristics, and the DNA sequences were run through nucleotide BLAST to identify the closest match for each bacterial colony. It was found that in general, the human-cultivated sites had a pH closer to neutral, and a higher microbial diversity than the wild sites. Bacteria from the genus Flavobacterium and Pseudomonas were isolated from the human-cultivated sites, while Bacillus bacteria were found at one of the wild sites. The second wild site was not successfully sequenced so its composition is unknown. Future studies might investigate in more depth the microbial composition of Longwood's soils by sequencing higher numbers of bacterial colonies or sampling more sites throughout campus.

Introduction

Soils in ecosystems across the world are home to a rich tapestry of microorganisms, including bacteria, archaea, and fungi (Aislabie and Deslippe 2013). These microorganisms play a vital role in global biogeochemical cycles (Rousk and Bengtson 2014). Microbes in soil are involved in the decomposition of organic matter, the nitrogen fixation process, and the solubilization of inorganic phosphorus, to name just a few examples (Lladó et al. 2017). The composition and diversity of soil microbes varies from habitat to habitat and can be affected by a variety of factors (Aislabie and Deslippe 2013).

One of the most important determinants of microbial composition and diversity is soil pH (Geisseler and Scow 2014; Sagova-Mareckova et al. 2015; Wang et al. 2018; Zhalnina et al. 2015). The highest microbial diversity is typically found in soils with a pH close to neutral, while acidic soils tend to show a sharp decrease in the diversity of species present (Sagova-Mareckova et al. 2015; Zhalnina et al. 2015). Several studies have also found that the specific composition of the microbial community varies depending on the pH of the soil, possibly because many microbes show a low tolerance to pH changes (Wang et al. 2018; Wei et al. 2018; Zhalnina et al. 2015).

One major environmental factor capable of altering the pH of soil is altered nitrogen content. Nitrogen is often used in mineral fertilizers, to support plant growth, and health in agriculture and landscaping (Geisseler and Scow 2014). However, addition of nitrogen has been shown in previous studies to cause soil acidification, thereby altering of the composition and diversity of the microbial community (Wang et al. 2018; Zhalnina et al. 2015). For example, one experiment showed that while *Proteobacteria* and *Acidobacteria* are the most common phyla in most soils, increasing the nitrogen content of soil—and thus lowering the pH—resulted in an increase in the relative abundance of the phyla *Actinobacteria* and *Proteobacteria*, and a decrease in the relative abundance of the phylum *Acidobacteria* (Wang et al. 2018).

In this study, soil was collected from four sites on the Longwood University campus. Two sites were categorized as human-cultivated—a flower bed and a campus sports field—and two sites were considered natural—the floor of a nearby forest and the bank of a nearby creek. The goals of this study were to (1) compare and contrast the microbial composition and diversity between the human-cultivated and natural sites, and (2) determine what, if any, correlation exists between the soil pH of each site and the microbial composition and diversity found at that location. It was hypothesized that there would be an appreciable difference in the composition and diversity of soil samples taken across Longwood's campus. Specifically, it was predicted that (i) the composition of the microbial communities would vary depending on the pH of the soil, and (ii) acidic soil would show a decrease in microbial diversity in comparison to less acidic soil.

Methods

Soil Collection, Sampling, and Analysis

Four sampling sites were chosen from the Longwood University campus. Two sites were categorized as *human-cultivated*, meaning they are actively managed by the school's Facilities Management team under a state-advised nutrition management program. Two sites were categorized as *natural*, meaning they are not actively managed by any human and are considered wild. The two human-cultivated sites were 1) a flower bed located between Upchurch University Center and Coyner Hall, and 2) the soccer field at Lancer Field, located off Griffin Boulevard. The two natural sites were 1) the forest at Lancer Park, behind the Environmental Education Center, and 2) the bank of Buffalo Creek also located behind the Environmental Education Center.

Soil was collected from each of the four sites in September 2021. Collection was performed using a sterile collection tube. The soil was scooped using the lip of the collection tube from the surface. For the soccer field, the surface layer of grass was scraped away and then the soil was collected. The soil was analyzed to determine its pH. 0.5 g of soil was mixed with 50 mL of sterile water and allowed to incubate at room temperature for approximately one hour; pH test strips were used to measure the pH. Along with pH, nitrate levels were shown on the test strip.

Bacterial Culturing

0.5 grams of soil was mixed with 50 mL sterile water and vortexed for 1 minute. In addition to a direct count sample, serial dilution was performed with sterile nutrient broth to obtain a 1:10 dilution and a 1:100 dilution. 100 µL each of the direct count, 1:10 dilution, and 1:100 dilution were cultured on nutrient- broth agar plates and incubated at room temperature for 48 hours before being refrigerated. After incubating for one week, bacterial colony characteristics were observed.

Bacterial DNA Isolation

One representative colony was chosen from each bacterial plate and DNA was isolated using the manufacturer's protocol outlined in the Quick-DNA Fungal/Bacterial Microprep kit from Zymo Research. First, the chosen colony was collected on the tip of a micropipette and added to 200 µL of phosphate buffered saline (PBS). Then, the bacterial solution was transferred to a BashingBead™ Lysis tube with 750 µL of BashingBead™ Buffer and vortexed for 5 minutes. The tube was centrifuged at 10,000 x g for 1 minute. 400 µL of the supernatant was collected, transferred to a filter collection tube, and centrifuged at 8,000 x g for 1 minute. After

discarding the filter, 1200 µL of Genomic Lysis Buffer was added to the collection tube. 800 µL of the mixture was then transferred to an IC column and centrifuged at 10,000 x g for 1 minute. The flowthrough was discarded and the remaining 800 µL of the mixture was added to the IC column and again centrifuged at 10,000 x g for 1 minute. After transferring the filter to a new collection tube, 200 µL of DNA Pre-Wash Buffer was added and the mixture was centrifuged at 10,000 x g for 1 minute. 500 µL of g-DNA Wash Buffer was added and the mixture was centrifuged at 10,000 x g for 1 minute. Finally, the mixture was transferred to a microcentrifuge tube and 20 µL of DNA Elution Buffer was added before the mixture was centrifuged at 10,000 x g for 1 minute.

PCR Amplification and Purification

After isolating the genomic DNA, PCR amplification was performed targeting the 16s rRNA gene. 3 µL of the isolated genomic DNA was added to a PCR tube along with 0.5 µL of 10 µL Forward Primer, 0.5 µL of 10 µL Reverse Primer, 12.5 µL of One*Taq* 2X Master Mix, and 8.5 µL of nuclease-free water. The samples were then thermocycled, starting with an initial denaturation at 94° C for 30 seconds, 30 cycles consisting of 30 seconds at 94° C, 45 seconds at 55° C, and 120 seconds at 68° C, and a final extension at 68° C for 5 minutes. Samples were then held at 4°C until collection. The primers chosen for PCR amplification were 5'GAGTTTGATYMTGGCTC-3' for the forward primer and 5'-NRGYTACCTTGTTACGACTT-3' for the reverse primer.

The PCR sample was then purified in the following manner. 25 µL of binding buffer were added to the 25 µL of PCR product in a purification column and centrifuged at 14,000 rpm for 60 seconds. After discarding the flowthrough, 700 µL of wash buffer were added to the column and again centrifuged at 14,000 rpm for 60 seconds. The sample was then centrifuged dry at the same speed for another 60 seconds to remove any ethanol residue from the wash buffer. After transferring the column to a new microcentrifuge tube and adding 50 µL of elution buffer, the sample was centrifuged at 14,000 rpm for a final 60 seconds to remove the DNA from the filter.

Gel Electrophoresis

In order to ensure that PCR amplification and purification were successful, a sample of the DNA product from PCR cleanup was run through gel electrophoresis. 5 µL of loading dye were added to 5 µL sample of DNA product in a microcentrifuge tube. The tube was microcentrifuged for 15 seconds to mix. 10 µL of dyed DNA were loaded in a well in the gel. 10 µL of DNA ladder were also added to a well. The samples were run at 120 volts for approximately 30 minutes before being exposed to UV light and photographed.

DNA Sequencing and Analysis and Bacterial Colony Identification

5 µL of each DNA sample were sent to EurofinsGenomics for sequencing. 4 µL of sequencing primer and 3 µL of deionized water were added to the samples. The sequencing primer used was 5′-GAGTTTGATCCTGGCTCAG-3′. Sequencing reactions of the amplified 16s rRNA genes were performed according to the Sanger dideoxy chain termination method. Sequences were reviewed using the SnapGene ® 5.3.2 tool and misidentified nucleotides were corrected. The edited 16s rRNA gene sequences were then compared to the rRNA/ITS database using the nucleotide BLAST and matched to the closest relatives by percent identity and number of gaps.

Results

Soil sample collection and analysis

Soil was collected from four locations on Longwood University's campus. Two human-cultivated sites were chosen: a flower bed near Upchurch and the soccer field at Griffin Boulevard. The two wild sites chosen were the forest floor behind the Environmental Education building and the bank of Buffalo Creek **(Figure 1)**.

The pH of soil is an important determinant of microbial diversity and composition. Therefore, the pH of each soil sample was obtained using test strips, as well as nitrate levels. The soil collected from the soccer field was found to have the pH closest to neutral, at 6.8, with the other three being more acidic. Nitrate was also measured and seemed to have no correlation with the pH levels at each location **(Table 1)**.

Bacterial plating and colony analysis

Each sample was cultured on nutrient broth agar plates, as a direct count, a 1:10 serial dilution, and a 1:100 serial dilution. After incubating, one plate was chosen for each of the four locations **(Figure 2)** and visual analysis was performed to note the morphological characteristics of the cultured bacterial colonies.

Visual comparisons of color and form were chosen to analyze the level of microbial diversity present in each sample **(Figure 3, Figure 4).** The soccer field was determined to be the most microbially diverse of the four samples **(Figure 5)**. This sample contained three sets of differently colored colonies—white, pink, and yellow—as well as two sets of colonies with different forms: punctiform and irregular. The other human-cultivated sample from the flower bed had both pink and white colonies, although all colonies were circular in form. In contrast, the wild samples from the forest floor and the creek shore had only white punctiform colonies, indicating low microbial diversity.

Figure 1. ***Human-cultivated and wild sample sites.*** *Soil samples were collected from four locations on Longwood University campus. Two human-cultivated sites were sampled: a campus flower bed and the soccer field at Griffin Boulevard (top row). Two wild sites were also sampled: the forest floor and the creek behind the Environmental Education Center (bottom row).*

Table 1. ***Soil pH and nitrate levels from each of the four test sites.*** *Using color-match test strips, each soil type was analyzed for pH and nitrate levels.*

	pH	Nitrate (ppm)
Human-cultivated sites:		
Flower bed (FB)	6.4	5
Soccer field (SF)	6.8	5
Natural sites:		
Forest (F)	6.2	3
Creek (C)	6.4	5

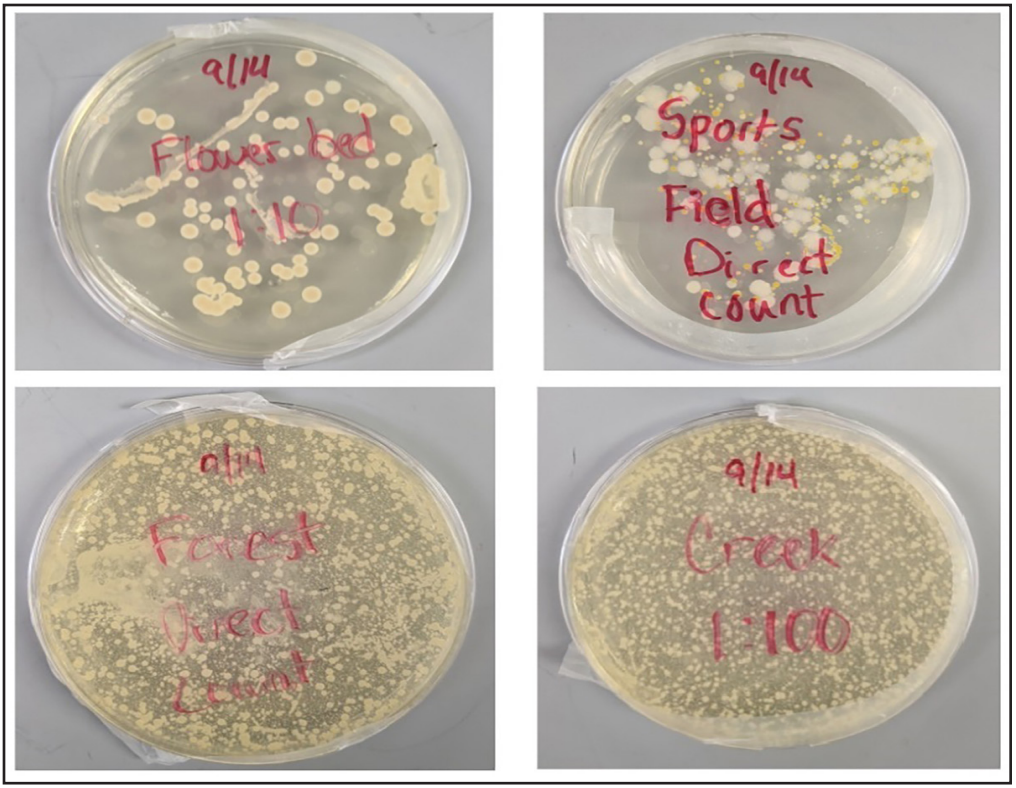

Figure 2. ***Bacterial growth of human-cultivated and wild sites.*** *Bacteria from each of the four sample sites was cultured on nutrient broth agar plates. One bacterial colony from each plate was chosen to undergo DNA sequencing of the 16s rRNA gene. Top row: the bacterial plates for the human-cultivated sites. Bottom row: the bacterial plates for the wild sites.*

Gel electrophoresis analysis of amplified 16s rRNA genes

The DNA was isolated from one bacterial colony on each of the four plates. After amplifying the 16s rRNA genes by PCR, the DNA samples were run on gel electrophoresis to check for successful DNA amplification. The resulting image **(Figure 6)** indicates that the flower bed and forest samples were both successfully amplified, showing clear bands around the expected 1800 base pairs. The soccer field sample does not show clear bands; there is a shadow around 500-700 base pairs that may be a band. The lack of clarity may indicate a low level of DNA loaded into the gel, or low resolution of the UV light image of the gel, as later DNA sequencing of the soccer field sample was successful. The creek sample shows no band and was not successfully sequenced later.

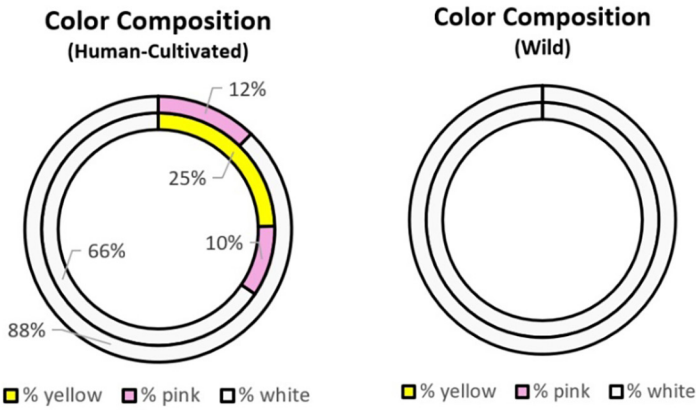

Figure 3. ***Color composition of bacterial colonies.*** Each of the four plates was visually analyzed for various morphological characteristics. *Left* - Analysis of the human-cultivated sites: The inside ring shows the color characteristics of the bacteria collected from the soccer field, while the outside rings shows the color characteristics of the bacteria collected from the flower bed. *Right* - Analysis of the wild sites: The inside ring shows the color characteristics of the bacteria collected from the forest floor, while the outside ring shows the color characteristics of the bacteria collected from the creek.

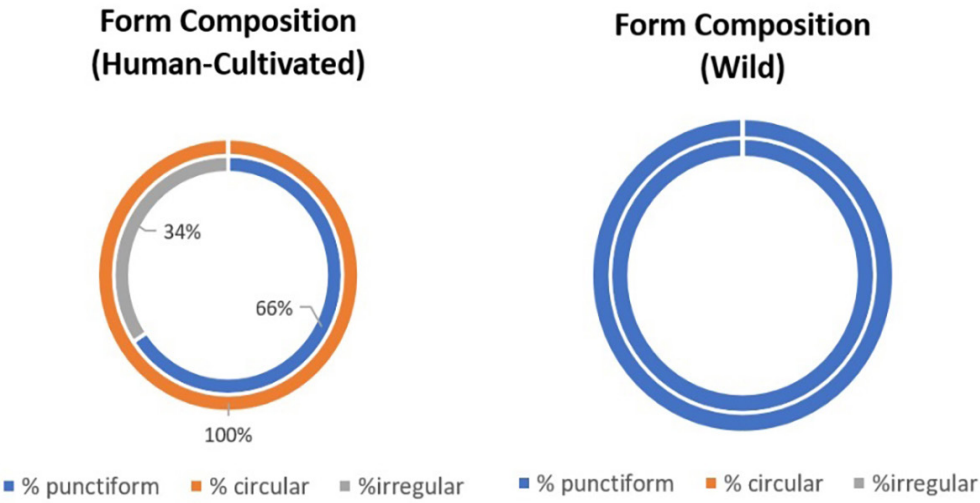

Figure 4. ***Form composition of bacterial colonies.*** *Each of the four plates was visually analyzed for various morphological characteristics. Left - Analysis of the human-cultivated sites: The inside ring shows the form characteristics of the bacteria collected from the soccer field, while the outside rings show the form characteristics of the bacteria collected from the flower bed. Right - Analysis of the wild sites: The inside ring shows the form characteristics of the bacteria collected from the forest floor, while the outside ring shows the form characteristics of the bacteria collected from the creek.*

Figure 5. ***The most microbially diverse sample: soccer field.*** *Visual analysis shows that the soccer field is the most microbially diverse of the four samples, having colonies of three different colors and two different forms.*

DNA sequencing of the amplified 16s rRNA genes

Sanger DNA sequencing was used to determine the specific gene sequence of the amplified 16s rRNA gene samples. Using SnapGene ®, the DNA sequences were visualized as a chromatogram and wherever possible, misidentified nucleotides– indicated by the letter N–were edited. The bacterial colonies from the flower bed **(Figure 7a)**, soccer field **(Figure 7b)**, and forest **(Figure 7c)** samples were successfully sequenced. The bacterial colony from the creek sample **(Figure 7d)** was not successfully sequenced, possibly indicating a problem during the DNA isolation and/or amplification process.

Bacterial colony identification

After the 16s rRNA DNA sequences were edited, each sequence was analyzed using an online program called nucleotide BLAST (Basic Local Alignment Search Tool) and matched to the closest relatives by percent identity and number of gaps **(Figure 8)**. The top ten matches for the bacterial colony isolated from the flower bed sample were all in the genus Flavobacterium. The top two potential species matches were *Flavobacterium hercynium* and *Flavobacterium hydatis*. For the soccer field samples, the top matches were in the genus Pseudomonas. The top two potential species matches were *Pseudomonas fragi* and *Pseudomonas psychrophila*. For the forest sample, the top two species matches were *Bacillus simplex*, also called *Peribacillus simplex*, and *[Brevibacterium] frigoritolerans* **(Table 2)**. Each sample colo-

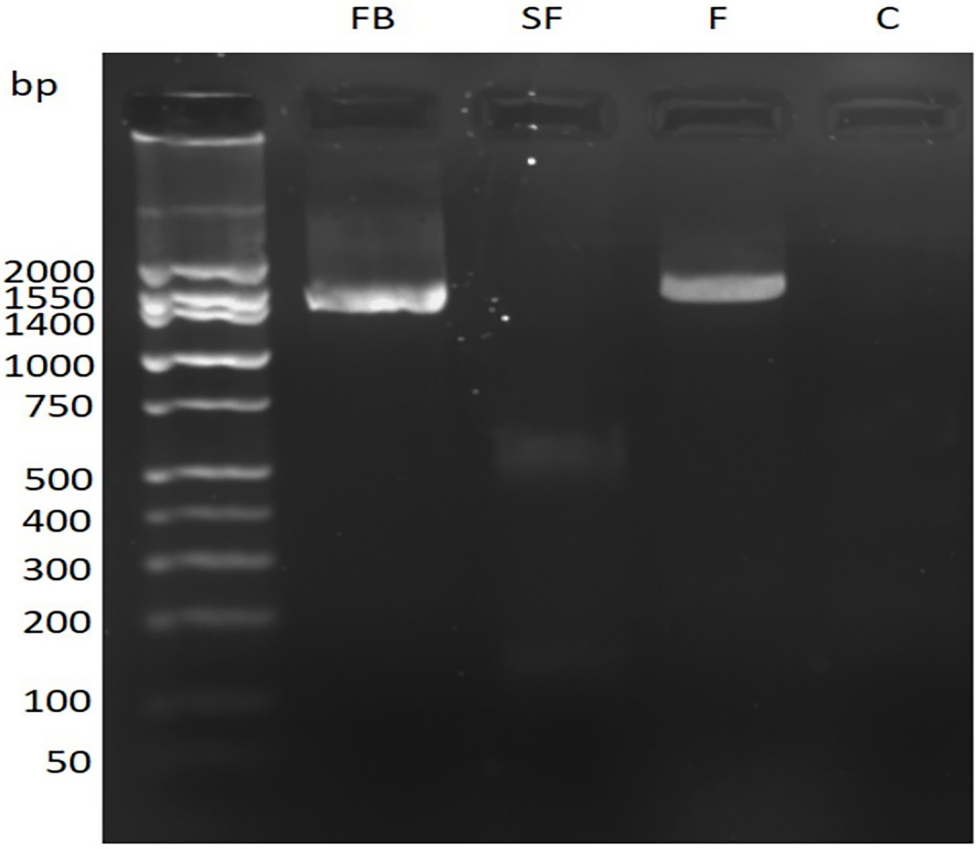

Figure 6. ***Gel electrophoresis of 16s rRNA PCR samples.*** *The bacterial 16s rRNA gene was amplified using PCR and run through gel electrophoresis to test for successful PCR amplification. The flower bed, soccer field, and forest samples were successfully amplified. The creek sample was not successfully amplified.*

ny's identity was ultimately narrowed down to the most likely candidate using research into the morphology and previous known locations of each bacterial species.

Discussion

Soil was collected from four sites on the Longwood University campus, two human-cultivated sites and two wild sites. The aim of this study was to compare the microbial composition and diversity between the human-cultivated and natural sites. It was predicted that the highest microbial diversity would be found in the soil with a pH closest to neutral, and that the microbial composition of each sample would differ. The results of this study supported both predictions.

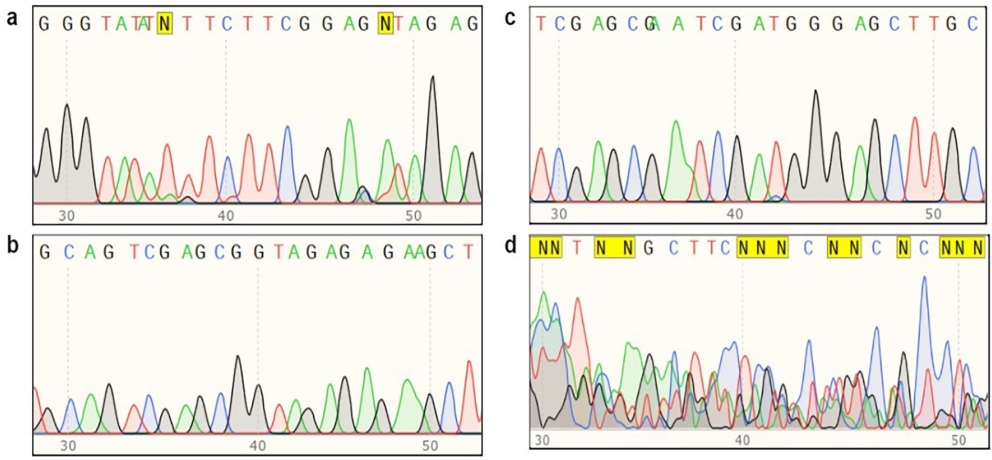

Figure 7. ***16s rRNA DNA sequence chromatograms isolated from the four test sites on Longwood's campus.*** *After PCR amplification, the bacterial 16s rRNA DNA sequences from each of the chosen colonies was sent for DNA sequencing. a. DNA sequence isolated from the flower bed bacterial plate. b. DNA sequence isolated from the soccer field bacterial plate. c. DNA sequence isolated from the forest bacterial plate. d. Unsuccessful DNA sequencing from the creek bacterial plate.*

Microbial diversity of human-cultivated and wild sites

Generally speaking, soils with a pH close to neutral show greater microbial diversity than more acidic or basic soils (Sagova-Mareckova et al. 2015; Zhalnina et al. 2015). The four soil samples collected from Longwood University's campus were all acidic to varying degrees. However, the human-cultivated sites were closer to neutral than the wild sites **(Table 1)**, possibly because of the state-approved nutrient management program that Longwood University applies when fertilizing and treating its campus green spaces. This plan specifies that the soil used in flower beds is composted soil from on-campus composting operations, and that all fertilizer is low in nitrogen, has no phosphorus, and is used at a bare minimum as indicated by soil tests (Habel, 2015). Increasing nitrogen content tends to lower soil pH (Wang et al. 2018; Zhalnina et al. 2015); however, it was found that nitrate levels did not correlate with pH in the soils that were sampled. This lack of correlation is not understood at this time. As both pH and nitrate levels were measured with color-match test strips, a more precise measurement technique could help shed light on this relationship.

The site that was closest to neutral was the soccer field, with a pH of approximately 6.8, and visual analysis of the cultured bacterial plates revealed that this was in fact the site with the most microbial diversity **(Figure 2)**. While having less diversity than the soccer field, the flowerbed still displayed higher microbial diversity than either of the two wild sites, contain-

Figure 8. ***BLAST match comparisons for the 16s rRNA DNA sequences isolated from the three test sites on Longwood's campus.*** *The 16s rRNA DNA sequences from each of the bacterial colonies were run through BLAST. The best match was chosen according to % identity match and number of gaps, as well as research into the characteristics of each possible bacterial match. a. BLAST results for the DNA sequence isolated from the flower bed bacterial plate. b. BLAST results for the DNA sequence isolated from the soccer field bacterial plate. c. BLAST results for the DNA sequence isolated from the forest bacterial plate. BLAST results are not shown for the bacteria isolated from the creek soil sample, as PCR amplification was unsuccessful and DNA sequencing failed to return meaningful results.*

ing at least two different types of bacteria. The overall total count of bacteria was higher for the wild sites, but they appeared to have a lower overall diversity, as all the colonies on each plate were extremely similar in color and form. The wild site colonies were also very similar to each other. The creek sample was not successfully sequenced, so it cannot be said for certain that the same species of bacteria made up both the forest and creek samples, but the visual similarity between the bacterial colonies does suggest this is a possibility.

Table 2. ***Top BLAST alignments for the sequenced bacterial colonies.*** The 16s rRNA DNA sequences from each of the bacterial colonies were run through BLAST, and the top two closest matches by % identify and number of gaps are displayed below.

Isolate (soil)	Closest BLAST alignment	Phylum	% identity	# of gaps	Previously found in
Flower bed	*Flavobacterium hercynium*	Bacteroidetes	97%	0	Stream water, compost
	Flavobacterium hydatis	Bacteroidetes	97%	2	Gills of diseased fish
Soccer field	*Pseudomonas fragi*	Proteobacteria	99%	1/873	Soil, freshwater, spoiled meat/milk
	Pseudomonas psychrophila	Proteobacteria	99%	1/873	Arctic water, cold room storage
Forest	*Bacillus simplex*	Firmicutes	99%	1/1052	Rhizospheres of plants
	[Brevibacterium] frigoritolerans*	Actinobacteria	99%	1/1052	Arid soil of Morocco, roots of plants in Nebraska

*It has been proposed that *Brevibacterium frigoritolerans* be reclassified as *Bacillus frigoritolerans*, based on genomic analysis of the 16s rRNA gene which showed a 99.7% similarity between the strain referred to as *Brevibacterium frigoritolerans* and a reference strain of *Bacillus simplex* (Liu et al.)

Microbial composition of human-cultivated and wild sites

The first human-cultivated site that was sampled was a flower bed near the Upchurch University Center. The top two species matches for the bacterial colony isolated from this site were both from the genus *Flavobacterium* **(Table 2)**. *Flavobacterium* is a genus of gram-negative, rod-shaped bacteria with over 130 recognized species. They are often found in water and soil, and some species of *Flavobacterium* have been known to cause diseases in freshwater fish (Bernardet et al. 2006). The most likely species match for the flower bed colony as assessed through nucleotide BLAST is *Flavobacterium hercynium*. This bacteria was among 10 new strains of *Flavobacterium* first isolated from a freshwater creek in Germany in 2007 (Cousin et al. 2007). *Flavobacterium hercynium* was found to grow in the pH range of 6.0 to 8.0, with an optimum pH of 7.1 (BacDive(a), 2018). This is consistent with the results of this study, as the flower bed soil sample was found to have a pH of 6.4, within the growing range of *Flavobacterium hercynium* **(Table 1)**. Additionally, *Flavobacterium hercynium* has been found among compost in Japan (Kim et al. 2012), which is consistent with this study, as the flower beds at Longwood University do use compost.

The second human-cultivated site that was sampled was the soccer field off Griffin Boulevard. The top species matches were all in the genus *Pseudomonas*, a genus of bacteria encompassing over 190 identified species. *Pseudomonas* bacteria are frequently found in water, soil, and in conjunction with plants and animals, and several species of *Pseudomonas* are known to cause infections in humans (Spiers et al. 2000). Certain species of *Pseudomonas* bacteria are used as plant growth-promoting rhizobacteria (PGPR), bacteria which competitively colonize plant roots and act against plant root pathogens, particularly fungi (Haas and Defago, 2005). *Pseudomonas fragi* was identified as the closest species match to the bacterial colony isolated from the soccer field. This is a species of bacteria often found in soil and water, and interestingly, in spoiling refrigerated food and raw milk. Like other species of *Pseudomonas*, *Pseudomonas fragi* has been shown to play a role as a promoter of plant growth (Ercolini et al. 2010). This is consistent with its presence in human-cultivated soil. Additionally, the soccer field is a location which sees frequent human contact, possibly explaining the presence of a bacteria typically associated with spoiling human food.

Two wild sites were sampled: the forest floor behind the Environmental Education Center and the shore of Buffalo Creek. However, only the forest floor sample was successfully sequenced; therefore, the microbial composition of the creek colonies is unknown. Unlike the soccer field and flower bed samples, it initially appeared that the top matches from the forest sample were not from the same genus. BLAST returned the top two species matches as strains of *Bacillus simplex*, also called *Peribacillus simplex*, and *[Brevibacterium] frigoritolerans*. However, in 2020 it was proposed that *Brevibacterium frigoritolerans* be reclassified as *Bacillus frigoritolerans*, based on genomic analysis of the 16s rRNA gene which showed a 99.7% similarity between the strain referred to as *Brevibacterium frigoritolerans* and a reference strain of *Bacillus simplex* (Liu et al. 2020). The other top BLAST matches for the forest bacterial colony were also species of *Bacillus*. Therefore, it is reasonable to conclude that the bacteria isolated from the forest sample is, at the least, a member of the genus *Bacillus*.

Bacillus is an incredibly diverse genus of bacteria, containing over 290 species/ subspecies, many of which are only vaguely similar to one another. Some species of *Bacillus* are pathogenic, causing disease in humans and animals, while others are used in industries such as agriculture and the development of medicines and vaccines (Gupta and Patel, 2020). Like *Pseudomonas*, some species of *Bacillus* function as the biocontrol agents, PGPRs (Haas and Defago, 2005). Most species of *Bacillus* are gram-positive, rod-shaped, and found in numerous habitats, including water, soil, and spoiling food (Gupta and Patel, 2020). *Bacillus simplex* has previously been found in the microbial communities associated with plant roots and shown to promote the growth of lateral root systems (Schwartz et al. 2013), which is consistent with its presence in the soil of a forest floor. The second most likely match according to BLAST,

Brevibacterium/Bacillus frigoritolerans, has also been previously isolated in conjunction with plant root microbial communities (Chen et al. 2021).

Soil bacterial phyla

Previous studies have found that although there are many different phyla of bacteria, only a few have been identified as relatively abundant in soil microbiomes. *Proteobacteria* and *Acidobacteria* are generally the most abundant phyla found in soil samples (Sengupta and Dick, 2015, Geisseler and Scow, 2014). This is consistent with the findings of this study, as the bacteria isolated from the soccer field was *Pseudomonas fragi*, a species of *Proteobacteria*. The bacteria isolated from the flower bed was from the phylum *Bacteroidetes*. It has been shown that the relative abundance of *Bacteroidetes* tends to increase with increasing pH (Geisseler and Scow, 2014). The bacteria isolated from the forest sample was from the phylum *Firmicutes*, of which *Bacillus* is the most well-known genus to be found in soils. They are often involved in the degradation of carbon sources (Sengupta and Dick, 2015). Ultimately, all three isolated bacteria species were from phyla known to be associated with soils in varying abundances.

Conclusion

This study has shown that human intervention in soil properties on Longwood University's campus may affect the diversity and composition of local soil microbiomes. Several future avenues of investigation are suggested by the results of this study. First would be to recollect and sequence a soil sample from the creek shore, to allow a comparison with the forest floor sample. The bacterial colonies on the forest and creek plates were very visually similar and may have in fact been the same species. Resampling would allow this to be confirmed. Additionally, it might be useful to collect samples from more locations around campus, and sequence multiple colonies from each location, in order to develop a more solid understanding of the microbial compositions than can be obtained from sequencing only one colony.

Soil microbial communities play a vital role in many biogeochemical processes that are important to the survival of plants and animals. Previous research has shown that human activity such as urbanization and agricultural cultivation can greatly alter soil properties. The introduction of nitrogen-containing fertilizers has been shown to affect the pH of soil, and thereby cause changes in microbial composition and diversity. While this study was specific to the Longwood University campus, research into the effects of human interventions in soil microbiomes—and ecosystems as a whole—can and should be considered worldwide. As the human population continues to grow and expand into new environments, it becomes more important than ever to invest in the conservation of Earth's biodiversity, from the largest of mammals down to the smallest of microbes.

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Reminiscent Modernism: *Poetry* Magazine's Modernist Nostalgia for the Past

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Abstract

Harriet Monroe's Poetry: A Magazine of Verse *embodies a form of early twentieth century modernism that is both modish and nostalgic. The journal embraces the experimental style of modernism by drawing from fresh new perspectives; however, it also publishes works that evoke a yearning for the past. Witter Bynner evinces nostalgic modernism in his poem "One of the Crowd" through his juxtaposition of a joyful natural environment with a restless industrial environment, illustrating a dissatisfaction with the age of modernity. T.S. Eliot echoes Bynner's pre-modern sentiments in his poem "Love Song of J. Alfred Prufrock" through his reference to Renaissance figures and depiction of mythological creatures, which are classical and romantic elements belonging to premodern eras. These poems, both published in* Poetry, *contribute to the magazine's complex modernism by portraying reminiscent themes that contradict the journal's contemporaneity. The poets' nostalgic attitudes, like Bynner's romantic tendencies and the value Eliot places on literary tradition, combine with Monroe's proclivity for nature to establish a modernism cloaked in reminiscence throughout the journal.* Poetry *synthesizes the unconventional literary styles of its contributors and the sentimental tones of its works, adopting a contradictory and idiosyncratic form of modernism which allowed its readers to diversely respond to their changing culture.*

Poetry: A Magazine of Verse was born out of modernism, a literary movement which surfaced at the turn of the twentieth century and broke with traditional forms of writing and expression. The age of modernity was an "urban condition" which emerged in the late nineteenth century and yielded rapid societal advancements in Europe and America (Scholes and Wulfman, "Rise of Modernism" 27). "Scientific habits of mind" defined the age of modernity (Schulze, "Pioneer Modernism" 51), as American society experienced a shift toward innovation, commercialism, and manufacturing. A change in outlook accompanied this shift in production, and there arose a "thoroughly modern, practical, scientific, and skeptical America" (52). Modernism was a "textual response to the demographic, economic, and technological developments that produced the modern world" (26). In other words, modernity constitutes the societal changes that took place, and modernism embodies the explosion of stylistic experimentation in the literary world in response to these changes. *Poetry* clearly communicates an association with modernism because it reflects the shift away from literary custom and toward the avant-garde for which this time was notable. However, in contrast to other modernist magazines like *McClure*'s and *The Little Review*, *Poetry* uniquely focuses on the mode of literary verse rather than prose or graphics, illustrating through poetic theme the attitudes of poets and readers in response to a changing culture. The journal's prominent contributors reveal through their works a form of modernism that is more mindful of tradition, expressing uniquely nostalgic attitudes which evince a longing for the past in a society eager for advancement.

Poetry also reflects founder Harriet Monroe's desire to reach a wider receptive audience. She started the magazine in 1912 with the help of sponsorships from several business leaders, and the absence of advertisements alludes to funding through continual sponsorships and subscriptions. Although the journal was an American publication based in Chicago, it housed poets, "both American and English," who offered excellent work "in English verse" (Monroe, "Motive of the Magazine" 28). Monroe, through her foundation of this "ideal example of a little magazine" ("Rise of Modernism" 36), was clear in her goal to seek out fresh new perspectives and forms. Appropriately, the journal's issues are comprised of several poems of various themes and structures which mostly feature poets who, at this time, were in the beginning stages of their literary careers. In place of images or advertisements, each volume includes suggested readings, implying a general audience of people with scholarly interest as well as newer modern writers looking for exposure. Monroe placed heavy emphasis on poetry as a respectable art form, one which should equal other modes of expression such as painting or sculpture in its profitability and reverence. *Poetry* was Monroe's call for great contemporary poetry to represent the time period, regardless of from whom or where the poetry came. Not only did Monroe found the journal, but she also edited it for its first twenty-four years of life.

From the very beginnings of the magazine's foundation, she adopted a personal policy as editor requiring impartiality toward specific poets and literary movements. In so doing, she embraced an all-encompassing body of poetry in which each individual contribution signified a nuanced, exploratory approach. In Vol. 1, No.1, Monroe's editorial comment affirms the evolutionary power of poetry:

> I suppose much of the monotony of subject and treatment observable in modern verse is due to this belief that poetry is merely a fixed way of repeating certain meritorious though highly familiar concepts of existence—and not in the least the infinite music of words meant to speak the little and the great tongues of the earth (24).

Monroe speaks to the profundity of meaningful verse, epitomizing the search for nuance in her withdrawal from the "monotony" of poetic construction that remains "fixed" and "familiar." Furthermore, she iterates how her search reaches "the little and the great tongues" alike, meaning she finds lyrical value in poems from those who are widely known and those yet to reach the public eye. Her broad search invited new voices to the fore, which in turn brought talented innovators who embraced modernism's unorthodoxy onto the stage of poetry. Monroe's vision for *Poetry* shines especially in the closing pages of each issue:

> We wish to show to an ever-increasing public the best that can be done today in English verse. If you love good poetry, subscribe. If you believe that this art, like painting, sculpture, music and architecture, requires and deserves public recognition and support, subscribe. If you believe with Whitman that "the topmost proof of a race is its own born poetry," subscribe (Monroe).

She envisioned a conversation between poet and reader, a collective voice through which they could respond to an adapting world. Not only would this conversation allow shared expression, but poetry as an art form would gain greater esteem for its role as a medium of communication.

The rapidly changing societal structure, undergoing technological and industrial advancement, invited conflicting attitudinal responses—predominantly, an overwhelming zeal for innovation. Individuals expressed their enthusiasm through their participation in literary movements such as Imagism, an incredibly direct writing style ("What is Modernism"). As scholar Matei Calinescu observes in his article "Modernity, Modernism, Modernization: Variations on Modern Themes," modernity became "just another word for renovation and innovation combined" (17), and in turn, "modernism came to designate the new, innovative, anti-traditional tendencies in the arts" (8). Not everyone shared this zest for vast urbanization and industrialism, however. The current of great sociocultural change met with resistance from those who

disapproved of the new rising sentiments, or, more aptly, opposed abandoning old ones. While many unequivocally embraced modernity, others conveyed a strong distaste for its ideals, "reject[ing] individualistic-bourgeois modernity as 'decadent' or corrupt in the name of a pure and just collectivist future or of a return to a mythical past" (6). Modernity as a social, cultural, and economic condition thus elicited conflicting responses, or rather, oppositional forms of modernism ("Rise of Modernism" 32). Traditionalism constituted one such response. Literary figures such as T.S. Eliot maintained the significance of tradition, and so opposed the rigidity with which the social and literary world approached innovation. These critics instead believed that understanding the context of literature's cultural past proved crucial in moving forward. Other figures, including Monroe, expressed what Scholes and Wulfman consider a turn "in the direction of an internal or spiritual world" (32). These various divergences from the predominant modernist enthusiasm suggest that many were dissatisfied with the pragmatism of modernity. An age that encouraged criticism inevitably opened itself up to that same criticism. Calinescu highlights the paradoxical nature of modernity, explaining that "in freeing the critical spirit, modernity cannot prevent the emergence of various critical reactions to its own cultural/ideological tenets and its intended or unintended consequences" (6). A time of such skepticism and open expression invited critique as well as interpretation; people brought their own meaning to modernism as a literary development. *Poetry* magazine represents these varied perspectives, including works from poets of diverse backgrounds and philosophies. In appealing to a wide audience comprised of conflicting viewpoints, Monroe established a comprehensiveness in the practice of poetry that augmented the artform's credibility.

Magazines transformed significantly in the 1890s, due to the advent of cheap, mass-produced periodicals ("Rise of Modernism" 30–31). Periodicals were crucial throughout the age of modernism because they conceptualized the modernist era through the eyes of those who lived it. The cheaper cost meant that they were available to a wider and more diverse public. *Poetry* shared this modernist stage with *McClure's* and *The Little Review*, which advanced their own ideals. Unlike *Poetry*, these magazines employed commercialism and sensationalism in their publications. *McClure's*, founded in 1893, gained immense popularity at the turn of the century by launching the "muckraking era" in which journalists exposed the "corruption in American government and big business" (*McClure's Magazine*). The journal also embodies modernity's commercialism, as "a typical issue easily averages a hundred pages of advertising" (*McClure's Magazine*). The magazine's integration of social commentary and advertising signifies its proclivity for change in both the social and literary spheres of American life. A typical volume of *The Little Review*, founded by Margaret Anderson in 1914, contains various stories and book advertisements. In Vol. 1, No. 1, contributor Sherwood Anderson discusses the

advancements in writing in "The New Note," claiming that this "new note" is "the voice of the new man, come into a new world, proclaiming his right to speak out of the body and soul of youth, rather than through the bodies and souls of the master craftsmen who are gone" (Anderson 23). Moreover, he warns readers against voices of old who claim their love for the new:

> And so the talk of the new note in writing will be heard coming from the mouths of the aged and from the lips of oily ones who do not know of what they talk, but run about in circles, making noise and clamor. Do not be confused by them. They but follow the customs of their kind. They are the stript priests of the falling temples, piling stone on stone to build a new temple, that they may exact tribute as before (23).

The tone of the work and the analogy of the "stript priests" foregrounds a dismissal of tradition as well as a rejection of the unnamed writers who hold true to it, suggesting that these aged voices maintain a faux appetite for unconventionality. Although *The Little Review*'s prose differs greatly from *McClure's* illustrative and exposé journalism, it shares an unwavering desire for advancement, and it urges this advancement by disregarding the past. *Poetry* is most unique in its use of literary verse; however, the journal's presence on the stage of modernism is more so idiosyncratic because it manifests a more conflicted standpoint. The works within the magazine, as well as the figures behind them, express an admiration for the movements and sentimentalities preceding modernity that modernity would seem to reject.

Poetry magazine's motto is a quotation by Walt Whitman: "To have great poets there must be great audiences too" (*Poetry*). This statement aligns with Monroe's vision for the journal and alludes to the notion of the literary form as a means of conveying human connection. To Monroe, the term "poetry" denotes more than simply the words on the page; it signifies a vessel through which individuals may understand each other and find commonality—a complimentary art. She highlights the communicative nature of verse in her essay "The Motive of the Magazine": "This art, like every other, is not a miracle of direct creation, but a reciprocal relation between the artist and his public" (27). Life, death, and everything in between constitute the experience; the poem is the feedback. In this sense, *Poetry* magazine greatly emphasizes the exchange between poet and reader, enabling a strong connection between the two. The poem acts as a diary of sorts; a shared, everlasting diary that tells of the human condition, in which secrecy is nullified but no element of the personal lost. A correspondence between those highlighted in the journal and those consuming its content allows for an overall portrayal of the collective response to modernity as a sociocultural movement. The reviews and comments section in Vol. 1, No. 5 of *Poetry* addresses the transformative nature of the time period and elucidates the means by which a poet must adjust to this remodeling:

> Since the passing of the nineteenth-century poets, the art of poetry, like the art of painting, has taken on new forms and become the vehicle of a new message. The poet of to-day speaks through so different a medium, his themes are so diverse from those of the elder generation, that he cannot hope to find his public in their lingering audience. He must look to his contemporaries, to those touched by the same issues and responsive to the same ideals (Rittenhouse 167).

In this manner, the journal expresses an explicit awareness of its audience, connecting with readers through their shared hunger for fresh perspectives. Modern verse aligns itself with the new-fangled style of its time by appealing to a contemporary audience while also gaining higher esteem as the "vehicle of a new message" (167). Poems allow for not only an outward reflection upon a time period, but also within the time period. They are self-reflexive, much like the age of modernism as a whole; this collection of works reflects upon the time period through an eager but sentimental lens. *Poetry*'s modernism is one of complex emotion, but the focus on emotion in itself proves telling during a period presumedly based upon "norms of rationality and efficiency" (Singal, "Definition of American Modernism" 7).

Some of the poems manifest clear contemplations of the changes brought along by industrialism. One example is Witter Bynner's "One of the Crowd" (1913), which communicates a distinctive yearning for a simpler pre-modernist time, a time before pleasure and intimacy were sacrificed for utility. In this time of forward-thinking and insurgent literary construction, a sense of nostalgia was quite distinctive. Eliot's "The Love Song of J. Alfred Prufrock" (1915) approaches modernism in a similar way, devoting particular attention to the Italian Renaissance. However, these two works are vastly different with regard to theme and level of exposure. "One of the Crowd" focuses primarily on elements of nature, shifting abruptly to imagery of a heavily industrialized society in contrast. "Prufrock" addresses themes of individual fear, exhibiting the feelings of paranoia and insignificance that emerge in old age. Eliot was a very prominent poet during this era and "Prufrock" still receives great acclaim, whereas Bynner is relatively unknown. However, the two poems contribute to *Poetry* magazine in much the same way. Through their romanticization of the past and their apparent disillusionment with present society, they both point toward the overarching modernist angle espoused by the literary journal. This is a paradoxically traditional angle, one which foregrounds an underdeveloped and mythical past, translating this past to contemporary forms. *Poetry* is modernism at a crossroads, the individual volumes and comments mirroring the enthusiastic yet discontented mindsets of the journal's contributors. Of course, modernity prompted such ponderings, with the societal and cultural transformations leaving its painters, poets, and audiences to either adapt or resist. *Poetry* magazine did both, and in turn, allowed its readers to choose, or to do the same. The journal's anomalous tone and subject matter is traceable to its founder, who

also displayed a distinctive response to modernity.

Monroe's relationship with modernism was a complicated one. While she wholly embraced and encouraged unconventional literary forms in her journal, she was hesitant to adopt the strictly scientific, skeptical attitudes of her fellow contemporaries because of how these ideals interfered with the arts. Monroe realized that "in sweeping the American mind clean of mystery, scientific democracy may have wiped away all impulses of awe toward God, nature, royalty, and place—impulses that made art possible" (Schulze, "Pioneer Modernism" 53). She shared with her contemporaries the zest for change and advancement in both the social and literary spheres; however, she also noted how the past left more room for beauty and art through its simpler aspirations. Because of her disparate sentiments, "Monroe struck many of her charges as prudish, provincial, and backward—a strangely unmodern champion of the modernist verse she worked so hard to bring to the unsuspecting American public" (50). She stood out especially in her attachment to nature, as the technological and skeptical western world did not act in accordance with the mysticism of nature. Monroe's personal modernism involved a strong admiration for nature and its direct influence on the modern era. In her own words, "Nature, the ultimate modernist, is ready to broaden [the poet's] vision and enormously increase his range, ready to give him, not more learning but power over all his learning" (61). She insisted on nature as a foundation of modernity as well as a steppingstone to true American newness, highlighting the mutually engaging relationship between nature and poetic expression. These ideals gained her a reputation for "backwardness" in the eyes of other modernists such as Ezra Pound, an early contributor to *Poetry* magazine and pioneer of modernist verse. For Pound, a figurehead of new literary methodologies such as Imagism, the notion of nature as a "touchstone of human sympathy and feeling" became increasingly retrospective and naïve in a society built upon "scientific management, efficiency, scientific accuracy, expertise, precisionism, and professionalism" (50); consequently, other modernists deemed Harriet Monroe's standpoint "culturally retrograde" (62). While she strove for objectivity throughout the editing and publishing process, Monroe's own contradictory modernist approach certainly shines through in her journal, perceptible to an audience who may share a similarly complex response to modernity.

Bynner was an early contributor to *Poetry* magazine. His work appears in the first volume, and additional poems and translations emerge in subsequent publications. Despite its clear manifestation of Monroe's vision, particularly with regard to his focus on nature, Bynner's work has not received much recognition. "One of the Crowd," published in Vol. 1, No. 5 of *Poetry*, demonstrates the magazine's individualized form of modernism in terms of its blending of acceptance and nostalgia in response to modernity. The poem is split into three stanzas, each of

which resembles a notable shift in focus. The first of these sections elevates nature as a primary thematic focus. For example, there are several allusions to mythological creatures like satyrs, dryads, nymphs, and fauns who "come out and play" ("One of the Crowd" 2). These creatures of fable and myth symbolize such splendors as peace, play, amusement, and freedom. Satyrs, the companions of Dionysus, the god of wine and "the personification of the blessings of Nature," symbolize the wild and free "life of the forest" ("Myths and Legends"). Tree nymphs, collectively forming the group of dryads, "bespeak health, vigor, and vitality," or otherwise exude a "quiet, self-reliant power" ("Myths and Legends"). The evocative images of mythological creatures set the poem against the skeptic realism with which many modernists approached art and literature, and further point toward nature as an all-encompassing theme. Nature as a focal point contrasts starkly against the increasingly urbanized society brought by modernity. This contrast bleeds into the second stanza, in which the speaker diverts focus to the realm of manufacturing and industrialism, a world in which there is "never a single soul at ease" ("One of the Crowd" 14). Bynner's use of nature invokes Monroe's modernist vision—one which involves a "sense of humility in the face of nature" (Schulze 55). Through the juxtaposition of nature and industry, the poem directs attention to the age of modernity, which was "driven by an astonishing array of new inventions" ("Rise of Modernism" 28). The poem does not mention these inventions directly; instead, the narrator emphasizes the laborers who "strain the eye with rivalries" ("One of the Crowd" 17) and attempt to "store the wasted gain away" (20). In underlining the workers' strife and omitting any notion of technological invention, the work refutes the assumption that with the influx of innovations and push toward convenience comes a lesser workload. The imagery of "a thousand people on their way / To offices and factories" (12–13) contradicts such an assumption, proving it false and proclaiming instead that in actuality the inverse is true—with greater convenience comes higher expectations for productivity. Mass production is the goal, but the mass is never quite massive enough. This portrayal of an industrialized society evokes a feeling of entrapment juxtaposed with the ethereal image captured by the first stanza, pointing toward an overarching sentiment: the longing for leisure, a wistfulness in the face of an evolving society. Similar to Monroe's expression of the loss of meaningful art in a world full of scientific skepticism, "One of the Crowd" exhibits hopelessness due to a loss of recreation. The third and final stanza truly grabs the audience, who, like the man in the crowd, are "looking for work, working for pay / And paying all [their] energies to earn true love" (27–29). The workers are the fauns and nymphs; thus, it is the readers whom the speaker addresses, begging "Come back again! We need you! Please!" (8). People who once were free are now slaves to invention. The rivers and forests are now factories. There is no more play, only productivity. This poem, as an early contribution to *Poetry*,

evinces the journal's nostalgic undertones, evidence that there existed forms of modernism which constituted a yearning for pre-modern times, despite the apparent contradiction with innovative modes of expression.

Bynner, while perhaps not explicitly voicing an opinion on the changing culture from which his works were born, certainly displays a contradictory approach in poems such as "One of the Crowd" through his combination of retrospective and contemporary motifs. His work contains key elements of both romanticism and realism. The poet signaled a "conservative bent as far as his own poetry was concerned," at least in comparison to the rapidly progressing society and literary practices of the early twentieth century (Stanford 390). This established proclivity is evident in Bynner's well-used elements of nature and mythology, which give his poems a profoundly wistful and dreamy resonance. Despite this apparent divergence from progressivist enthusiasm, Bynner's realist imagery in "One of the Crowd" exhibits a clear contemporary awareness for which Monroe searched far and wide. For example, the town setting in the second stanza, followed by the focus on "offices and factories" ("One of the Crowd" 13), fits the realistic, mundane mold of literary realism. "Drabness asserts itself" (Slattery, "Literary Realism" 57) in this setting, granting the poem's readers a look into the norms of their current society. The scene Bynner crafts in "One of the Crowd" had a reach with the modern audience, as readers may have related to his expressionism. In other words, Bynner evokes the inventive, prolific essence of modernity while also holding fast to a pre-modern veneration of nature. Hence, scholars best describe his literary voice as a "compromise between the experimentalists and the traditionalists" (Stanford 390). This compromise, or amalgam rather, between literary tradition and literary innovation characterizes the form of modernism which *Poetry* magazine promotes.

"The Love Song of J. Alfred Prufrock" is one of *Poetry*'s best-known publications, and, similar to "One of the Crowd," it transparently responds to the cultural movement during which it appeared. The poem clearly resonates with a cultural past, more specifically the Italian Renaissance. The references to Renaissance figures and ideals, evident in the repetition of "In the room the women come and go / Talking of Michelangelo," recall an earlier time, a more humanistic and perhaps simpler time ("The Love Song of J. Alfred Prufrock" 13-14). Much like Bynner, Eliot depicts mythological creatures as prominent figures in the poem: Mermaids "wreathed with seaweed red and brown," (130), singing and "riding seaward on the waves" (126). Their presence reveals Eliot's premodern leaning because it indicates an "orphic, mystical attachment to nature" (Schulze 51) from which many modernists disengaged during the scientific age of rationalism. Many literary figures such as Monroe, Bynner, and Eliot, however, "felt uneasy about abandoning" (51) the romantic tendencies preceding modernism. Eliot's

references to Renaissance figures and mythological creatures further these romantic tendencies, as they function alongside each other in evoking symbolic images of beauty and rebirth. Furthermore, the mermaids represent a revival of wonder and amusement, a diversion from the rigorous activity of modernity. Once more, mythical imagery conveys a longing for a time before compared to the present dreary and laborious human world: "Till human voices wake us, and we drown" ("Prufrock" 131). The two poems share this sense of listlessness stemming from the changing culture. Both works reflect a strand of modernism that questions the worth of modernity. This evaluative form surfaces in contemplations such as "What can it profit them?" ("One of the Crowd" 16) and "Would it have been worth it, after all?" ("Prufrock" 87). The transformative nature of modernity undoubtedly elicits notions of an unyielding societal advancement or, as is the case in these poems, a remembrance of things left behind. As stated by Scholes and Wulfman, "Magazines from an earlier period have a unique ability to bring social, political, and aesthetic history to life for those who read them with energy and care" ("Modern Magazine" 167). These works by Eliot and Bynner, through their sentimental tone and romantic attributes, substantiate *Poetry*'s recurrent evocation of what came before, embracing the new in memory of the old—contemporaneity and nostalgia.

Eliot's modernist position equaled that of Bynner in uniqueness, and gathered more publicity. After the publication of "Prufrock" and other poems like *The Waste Land*, Eliot exerted significant influence in the age of modernism. His works embodied a break from convention symbolized in this literary and philosophical movement; however, he did not hesitate to criticize the very mode of thought in which he wrote and found great acclaim. His education, awareness, and emotion "combined to make him the most articulate of the modernist social critics" (Moody 61). Although he lived in England for the majority of his literary career, Eliot identified heavily with the American literary perspective. In an interview with *The Paris Review*, Eliot states: "I'd say that my poetry has obviously more in common with my distinguished contemporaries in America than with anything written in my generation in England" (Hall). He speaks further on his poetry and its connection to his regional environment: "It wouldn't be what it is if I'd been born in England, and it wouldn't be what it is if I'd stayed in America. It's a combination of things. But in its sources, in its emotional springs, it comes from America" (Hall). Eliot's ties to American modernity are undeniable both through the audience of his published works and his relationships with other poets. His acquaintance with Ezra Pound exemplifies his close connection to modernist ideals, as Pound was a key proponent during the early stages of the modernist movement. Both poets as well as critics, they shared a connection to *Poetry* magazine. As it happens, Pound "was able to confirm 'Prufrock' as starting-point," assisting Eliot by providing him with resources and a broader vision (Moody 119).

Though they shared the stage of modernism, the dissimilarity in their perspectives and critical attitudes is noteworthy: "Pound's relation to Eliot was complementary: besides the material assistance he gave, he provided someone against whom Eliot could fitly measure his difference" (119). Eliot, similar to Bynner, manifests in his works a seemingly antithetical response to the evolving sociocultural environment. "His early writing struck readers as provocative and outrageous when it appeared" (116), evidencing the poet's alignment to the avant-garde composition of modernism. However, at the same time, the "retroactive shape" (111) of his career and his "disaffection with the nineteenth century, as an age of bustle and 'revolutions which improved nothing'" (62) signify a clear pre-modernist orientation. Given Eliot's renown as a literary figure, his position in the modernist movement "had a particular consequence for the production, circulation, and consumption of modernist literature" (Brazil, "Modernist Literature" 80). He thus contributed his louder, more influential voice to *Poetry*'s nostalgic modernism, his presence on the pages giving them greater weight.

Just as Monroe highlighted the meditative continuity between poet and audience, Eliot urged traditional continuity amongst poets dead and living. Eliot plainly outlines his discontent with strictly modern modernism in his essay "Tradition and the Individual Talent." Throughout the essay, he asserts the importance of listening to the voices of the past. "We dwell with satisfaction upon the poet's difference from his predecessors," he states, identifying the collective modernist aspiration for unorthodoxy, "We endeavor to find something that can be isolated in order to be enjoyed" (Eliot 36). Eliot considers this endeavor a pursuit by way of prejudice, claiming that "if we approach a poet without this prejudice we shall often find that not only the best, but the most individual parts of his work may be those in which the dead poets, his ancestors, assert their immortality most vigorously" (Eliot 36). He maintains this focus on the connection between modern and dead poets throughout the essay, thus propounding a modernism grounded in tradition. He claims that the contemporary poet's significance and appreciation stems from "his relation to the dead poets and artists" (37). From this sentiment, Eliot frames a call to action of sorts, one which is directed toward modernist poets in particular. He affirms that poets must live in "what is not merely the present, but the present moment of the past" (42), meaning that, to him, modernism signified an opportunity for commemoration rather than solely a shift to experimentation. In a social and literary movement defined by the eagerness to produce something entirely new, Eliot argues for the remembrance of things past. Moreover, he contends that efforts to diverge from works considered antiquated are futile, as these works are interwoven into the very fabric of literary feeling. His attention to bygone poets compares to Monroe's awe of nature and Bynner's subjectivity in that it looks backward before looking forward. Consequently, *Poetry* is a product of these musings and

more, providing its audience an array of modernist outlooks rooted in reminiscence.

Poetry: A Magazine of Verse was, and still is, a key contributor to the age of modernism from which it emerged. According to Scholes and Wulfman, "Magazines are part of a cultural web" ("Modern Magazine" 149), embodying the attitudes of their day as well as fueling them. While *Poetry*, *McClure's*, and *The Little Review* all comprise that very same web of experimentalist and contemporaneous thinking, each collection channels this literary shift through distinct modes of representation. *Poetry* is unique in how it represents topical attitudes through the inclusion of new poetic forms and voices, while also displaying a somewhat reluctant acceptance of the industrialism that arose from modernity. "Modernism had everything to do with urbanization" ("Rise of Modernism" 40), and this is true for *Poetry* as well, although the receptive journal signifies a particularly nostalgic form of modernism. Bynner's "One of the Crowd" offers an image of natural bliss as well as a dispiriting window into industrialization, calling to the reader's attention all that has evanesced in the wake of technological advancement. Eliot's "Prufrock" reminisces on times preceding modernity, illustrating the suffocating environment created by rapid industrialism—a sensation similar to that of drowning. These poems bespeak the longing that is ever-present in the earlier issues of *Poetry*—the longing for renewal. Though the narrators and mythic creatures featured in the poems may be fictitious, the notions of nature's authority and leisure's significance are palpable in the pages of the magazine. The enduring quality of this journal speaks to its reach with readers who could find their own sentiments reflected in the poems, whether nostalgic, visionary, or a combination of the two. As both a symbol of modernism and an anomaly of it, *Poetry* magazine presented an idiosyncratic approach to idiosyncrasy. That is to say, the journal engaged in the newness of the era while also pausing to look back when it seemed that no one else would.

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Challenges Faced by Healthcare Workers During the COVID-19 Pandemic: A Preliminary Study of Age and Occupational Perspectives as Expressed in Language

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Abstract

This report highlights the challenges healthcare workers have faced during the COVID-19 pandemic. Linguistic data from the subjects' interviews was coded and then analyzed for key themes. Results show that challenges for healthcare workers have varied throughout the pandemic. While workers were originally stressed over the uncertainties and constant change, workers emphasize the burnout they and many of their coworkers have experienced lately as the pandemic has continued. This research recognizes two different mechanisms for combating the stress and burnout healthcare workers experience: working through their challenges with coping mechanisms (e.g. exercise, therapy, or being comforted by friends and loved ones) and facing their challenges head-on and powering through the pandemic. The purpose of this research is to provide understanding into what healthcare workers have faced, which can show their community members how healthcare workers can be better supported in the future.

Introduction

Research Topic

The topic of this research was "Challenges faced by healthcare workers during the COVID-19 pandemic." This topic was chosen because the COVID-19 pandemic is constantly evolving and is currently an under-researched area in the field of anthropology. Specifically, focusing on healthcare workers' challenges with the pandemic is important because it has been a difficult time for these workers and this research can document their specific challenges and potentially be useful if similar circumstances arise in the future. The expectations at the start of this research were that healthcare workers would mention multiple challenges they have faced, such as increased hours, more protocols they are required to follow, and difficulties with mental and physical health. The hope was that the data gathered from this research could benefit healthcare workers by making their challenges known and potentially alleviating future stressors.

Literature Review

Previous anthropological literature on COVID has mainly centered around how the pandemic has altered social interaction. Some literature has detailed healthcare workers' experiences, but the majority of such research has focused around healthcare workers' thoughts on vaccine hesitancy and the spread of medical misinformation. For example, "Pandemic Perspectives: Responding to COVID-19" is an interesting article from early in the pandemic that predicts the trajectory of the pandemic, but this particular source discusses little about how the pandemic affects healthcare workers (Ennis-McMillan et al. 2020).

However, some examples of anthropological literature on COVID relate nicely to this research topic. "Clinicians on the Frontlines of the COVID-19 Pandemic" discusses many social factors healthcare workers and their patients face in relation to COVID-19, which can lead to unique challenges (Block 2021). The book *Viral Loads: Anthropologies of Urgency in the Time of Covid-19* also contains a chapter that covers COVID-19 from a healthcare worker's perspective. This particular chapter discusses many of the complications the respondents mentioned facing while conducting this research, such as how staff became overwhelmed because of the newness of the virus and the sheer number of patients toward the beginning of the pandemic (Block and Vindrola-Padros 2021). This new research on "Challenges Faced by Healthcare Workers During the COVID-19 Pandemic" is an important addition to research in this field because it shows the evolution of healthcare workers' experiences throughout the pandemic thus far and how their main challenges and concerns have changed through the past months.

Research Questions

The goal of this research was to answer five main questions:

1. How has the added stressor of working in-person during the COVID-19 pandemic affected healthcare workers' work lives?
2. How has the added stressor of working in-person during the COVID-19 pandemic affected healthcare workers' lives outside of work?
3. How has continuing in-person work during the pandemic affected employees' physical health?
4. How has continuing in-person work during the pandemic affected employees' mental health?
5. How have COVID-19 precautions complicated employees' work experience?

These questions guided the interviews and the answers made up the bulk of the accumulated data. Throughout the course of this research, the research questions did not change. These research questions were broad enough to cover the topic and create a detailed picture of healthcare workers' experiences, so the questions formulated at the beginning carried through to the end of the research.

Interview Schedule

The interview schedule was made up of four main sections that closely coordinated with the research questions, combining the questions pertaining to workers' mental and physical health into one broader section. These sections made up the outline of the research schedule, which also included more in-depth questions to ask respondents based on the trajectory of the interview. For example, if one research question yielded interesting feedback from a respondent on mental health, then more detailed follow-up questions were asked of that respondent and future respondents. Other interviewees had not faced certain challenges, such as issues related to mental health, so these interviewees were not asked questions from those sections.

IRB, CITI, and Hypothesis

In order to conduct this research and work with human subjects, the researcher was required to become CITI certified. The researcher completed this certification in January of 2020, so the certification was valid while conducting this research. To gain IRB approval a detailed proposal was submitted to the IRB at the Longwood University Academic Affairs Office. This proposal included details on data management, analysis, and presentation, as well as other important details related to this research. The hypothesis of this research is that

linguistic analysis will reflect patterns in subjects' attitudes and ideas about challenges faced by healthcare workers during the COVID-19 pandemic.

Interview Process

This research included five interviews, ranging from 10 minutes to 40 minutes, all of which were conducted virtually. These five people were the only ones approached for an interview, and there were no additional subjects due to time constraints. The subjects were chosen based on the interviewer's personal network. The subjects all had different occupations in the medical field and worked in a variety of locations (e.g. family clinic, hospital, or travelling healthcare worker) in order to gain as broad a sample as possible. In order to transcribe the interviews, the conversations were recorded via the application Otter and were later combed through for accuracy. The only issue encountered during the interviews was the level at which the respondents were willing to discuss their experiences. Some respondents were not very forthcoming with information, while others were enthusiastic and dove into stories that veered away from the main topic. In order to manage these problems, detailed questions were used in order to recenter the conversation. This method worked well and proved that the well-developed interview schedule was an asset going into the research.

Analysis and Results

Having conducted and transcribed the interviews, the researcher noted specific patterns. All respondents mentioned how the challenges they faced during COVID have evolved and changed over the months. That being said, many of them made it clear that their jobs have not become easier during the pandemic, contradicting what the interviewer had expected going into the research. Rather, the healthcare workers interviewed during this research discussed how their challenges have changed and now, months into the pandemic, they and many of their coworkers have become "burnt-out" and face even more stress at work than in the early months of the pandemic. Another key theme healthcare workers mentioned was how thankful they are and how lucky they are compared to others, whether for their own and their families' health, the fact that they have job stability, or the fact that they are not having as difficult a time during the pandemic as some other healthcare workers are unfortunately having. This theme was rather unexpected because the respondents were asked about the various challenges they have faced, but they all chose to remain positive and optimistic.

Computational Linguistic Analysis—KH Coder

Data preparation involved combing through each individual interview transcription for accuracy, combining all the documents into a single Excel document, and plugging said docu-

ment into KH Coder. The researcher created a stop words list of certain words for the software to discount while running different variables. This software, although sensitive at times, was an excellent tool for coding the interviews as long as specific details were not overlooked. For example, once it came time for coding, the stop words had to be replaced in order to run codes that had phrases that included certain stop words. Otherwise, the codes would not run. There was a small pool of respondents used in this research, but the variables used were age and occupation. Age was divided into three ranges: less than 40, 40–50, and older than 50. Each of the respondents had a different occupation: pharmacist, doctor, nurse, respiratory therapist, or physician assistant.

Word Frequency List

The word frequency list was the first step in analyzing the data because it indicated linguistic themes that deserved greater attention. The top three words from the Word Frequency List are "COVID," "patient," and "people." "COVID" was by far used the most by the respondents, as this word was mentioned a total of 94 times while the next most-commonly-used word was only used 72 times. It is understandable for "COVID" to be used the most because healthcare workers were interviewed, and they were discussing how COVID has affected them in their work. They also treated COVID patients, or people with COVID, so these words being numbers two and three on the list is self-explanatory. During the interviews, the healthcare workers often shifted focus onto the patients and their interactions with patients, whether positive or negative. "Patients" and "people" being used so often also represents our people-oriented culture and the desire to help and support others. One unexpected element about the Word Frequency List was how low mentions of mental health issues were ranked. These issues were expected to be higher up in the complications faced by healthcare workers, but "anxiety" was number 49, "depression" was number 78, and "stress" was only number 83.

Co-occurrence Networks

Co-occurrence networks measure how closely words or codes relate to one another in a set of linguistic data. They are useful in indicating different clusters or linguistic "conversations" in data, and the word-word Co-occurrence Network **(Figure 1)** brought multiple different themes to light. At the top of the image is a cluster of words that includes "safe," "staff," "meeting," "change," "protocol," and "new." These words are all connected to a larger conversation that links all the respondents. These healthcare workers all said that one of their main challenges introduced by the pandemic was the ever-changing protocol. This was not necessarily one of the main expectations going into this research, but the respondents all mentioned how the many (virtual) staff meetings discussing safety procedures and new protocols

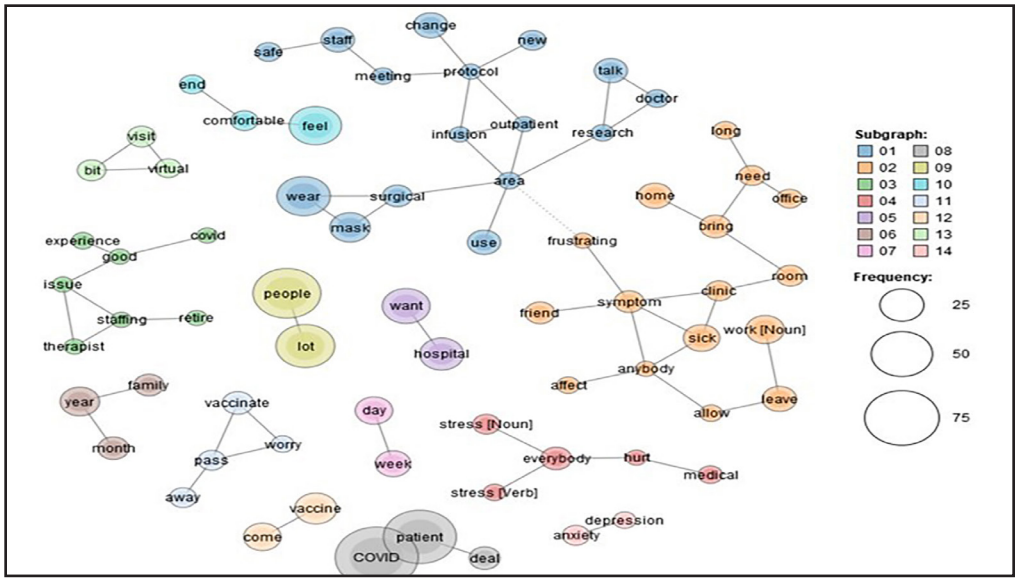

Figure 1. *Co-occurrence network of words showing the relationship between words and their frequency.*

were a big source of stress in their lives. Another important word cluster is "vaccinate," "worry," "pass," and "away." Because of their line of work, many of the respondents found themselves fielding questions from patients and their own family members related to the efficacy of the vaccine. These healthcare workers also mention hearing these people spread misinformation and vaccine hesitancy. Being privy to these conversations, the respondents were worried that if these people did not get vaccinated then they would pass away. This idea, as well as attempting to convince these people to protect themselves and others, was another challenge identified in this research.

The co-occurrence network that was plotted using the variable of age **(Figure 2)** introduced interesting ideas about different generations' openness in discussing mental health. The younger healthcare workers discussed the difficulty of dealing with increased anxiety and depression in their patients, coworkers, and in themselves. People within the middle range of ages focused more on the stress of work and staffing, but the word "home" at the top of the graphic shows how they felt they were able to create a successful work-life balance and leave the majority of their stress at work. The respondents on the older end of the spectrum discussed their mental and emotional health the least, instead homing in on how the pandemic affected their lives at work and the procedures they had to take. For example, the words "wear," "surgical," and "mask" were more common with this group.

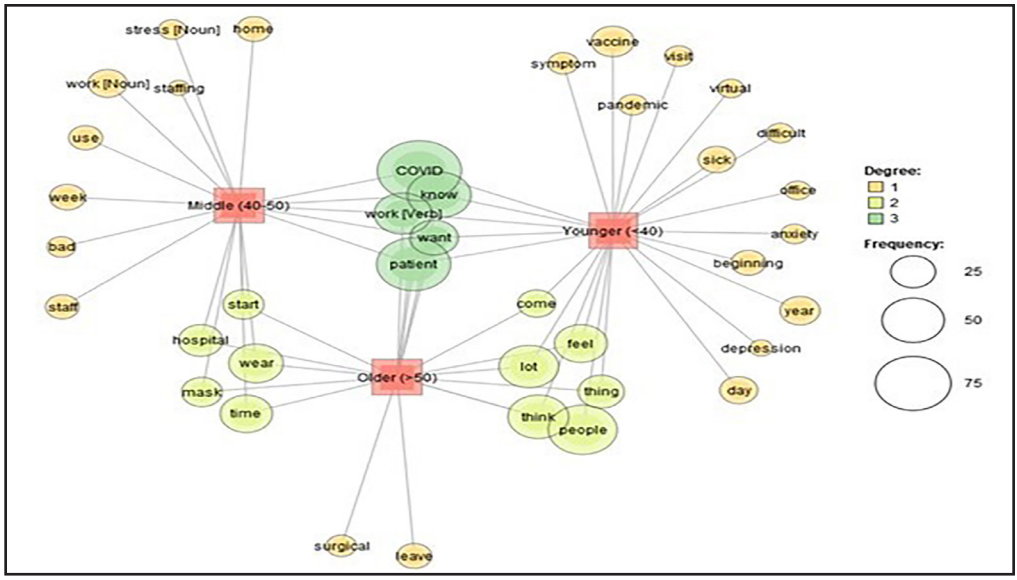

Figure 2. *Co-occurrence network of words, showing the relationship between words and their frequency, with the variable of age.*

These co-occurrence network plots provide interesting insights on the specific struggles healthcare workers have faced. The plots also show how certain challenges may be prioritized as a larger issue compared to others. Specifically, the role of mental health in this research cannot be overlooked. The COVID-19 pandemic has heightened issues related to mental health, and these issues are clearly visible in healthcare workers who are on the frontlines.

Correspondence Analysis

Correspondence analyses show which linguistic "conversations" or co-occurrence networks are broadly shared across the collected data and which are outliers or not broadly shared. The more broadly shared "conversations" are in the middle of the graph and the outliers are toward the peripheries. The word-word Correspondence Analysis **(Figure 3)** was run using the variable of occupation, as each respondent had a different occupation and occupation was a simple natural identifier. In the middle of this graph is the word "lot." At first glance this word may seem like it should be a stop word, but it in fact carries important meaning. This is the word that best connects all the respondents' conversations and experiences. These healthcare workers talked about how there was a lot of change, a lot of stress, and a lot to deal with. It is a symbol of all the challenges they have had to face during the pandemic. An interesting comparison to make is between the nurse and the pharmacist, who are on oppo-

site ends of the spectrum as far as one-on-one interactions with the patients. The pharmacist often worked in more isolated pats of the hospital, as is clear in the more distanced words in the pharmacist's upper right corner of the graph. In contrast, the nurse worked closely with COVID patients over the past year and a half and talked about the "hurt" she has seen, the "scary" moments, and the many complications she has had to learn to "deal" with. This shows how, even within the medical field, people of different occupations have very different experiences and perspectives expressed in the language they use. Depending on location and circumstance, the issues and complications people face vary greatly.

Codes

Six codes were written for this research: Positive experiences with COVID, Negative experiences with COVID, Truths, Hedges, Mental health issues, and Coping Mechanisms. The codes for positive and negative experiences with COVID were used to highlight the relationship between the two because the respondents unexpectedly decided to focus on many of the positive aspects they have experienced during the pandemic. Truths and hedges were linguistic codes used to describe the way the healthcare workers responded to certain questions. Those who used truths (e.g., know) were more forthcoming with information, while those who preferred hedges (e.g., think or feel) were more guarded. The chart detailing code frequency **(Figure 4)** shows that it was much more common for respondents to discuss the negative experiences they have had with COVID compared to the positives, although it is important to note that there ended up being so many positives that it warranted being its own code.

The Co-occurrence Network of Codes that includes truths, hedges, and negative experiences with COVID **(Figure 5)** helps display interesting linguistic patterns among occupations. Negative experiences are the uniting factor, while hedges and truths are at different extremes and coordinate with two or three different occupations respectively. There is the possibility that this is simply the result of each individual interviewee's way of speaking, but there may in fact be a broader theme. More research must be done in order to gain more data to lend support to the theory of people from different occupations speaking differently when it comes to hedges vs. truths.

The second Co-occurrence Network of Codes shows interesting connections between negative experiences, positive experiences, and coping mechanisms **(Figure 6)**. Again, all respondents are united by their negative experiences with COVID and the challenges they have faced, but the individuals had one of two ways of dealing with these challenges. Respondents either decide to focus on the positive aspects of their job or discuss the specific coping mechanisms they have taken. Focusing on the positives is a way of "powering through" the

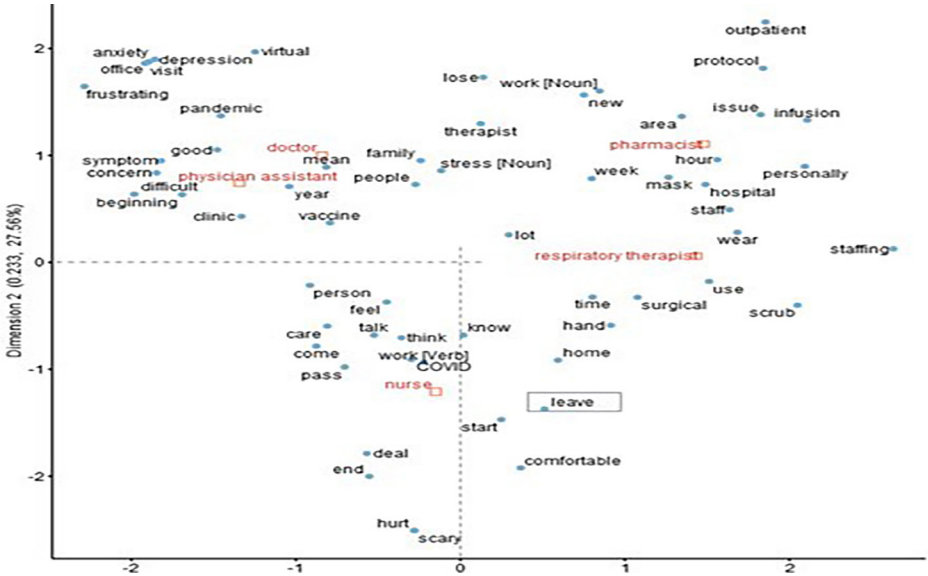

Figure 3. *Correspondence analysis of words, showing the relationship between words and their frequency, with the variable of occupation.*

codes	frequency	percent
*Positive_experiences_with_COVID	20	3.09%
*Negative_experiences_with_COVID	88	13.58%
*Truths	50	7.72%
*Hedges	77	11.88%
*Mental_health_issues	33	5.09%
*Coping_mechanisms	23	3.55%
#no_codes	414	63.89%
N of Documents	648	

Figure 4. *Frequency of code occurrences in linguistic data.*

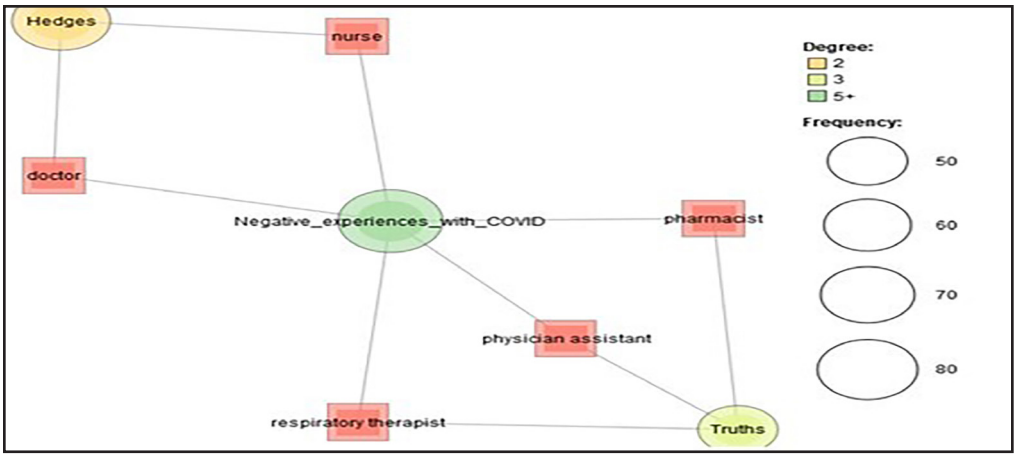

Figure 5. *Co-occurrence network of codes showing the relationship between select codes (truths, hedges, and negative experiences) with the added variable of occupation.*

stress this pandemic has causes and holding out until the end. Those who had specific coping mechanisms (e.g., therapy and time with friends) saw that the pandemic was not coming to an end in the near future and took specific action to protect their mental and emotional health. Another detail to highlight is that the respiratory therapist and the nurse, the two occupations that work closest to patients and have had some of the most stressful experiences during the pandemic, have decided to focus on the positive experiences rather than coping mechanisms. One theory that supports this outcome is that they have been too overworked and overwhelmed to devote the time to focus on their own mental health and have instead decided to focus on the positives already present in their lives at work.

Conclusions

The hypothesis of this research was that linguistic analysis would reflect patterns in subjects' attitudes and ideas about challenges faced by healthcare workers during the COVID-19 pandemic. The accumulated data provided such patterns. The Word Frequency List emphasized how healthcare workers have had constantly evolving challenges and stress over these past months. The word-word Co-occurrence Network **(Figure 1)** created a vivid picture of these challenges, including virtual meetings, changing protocols, staffing issues, and frustrating patients. The concepts this research coded for were: positive experiences with COVID, negative experiences with COVID, truths, hedges, mental health issues, and coping mechanisms. There was a wide range of responses when healthcare workers were asked about mental health issues, which varied by age **(Figure 2)** often also varied by occupation **(Figure 5)**.

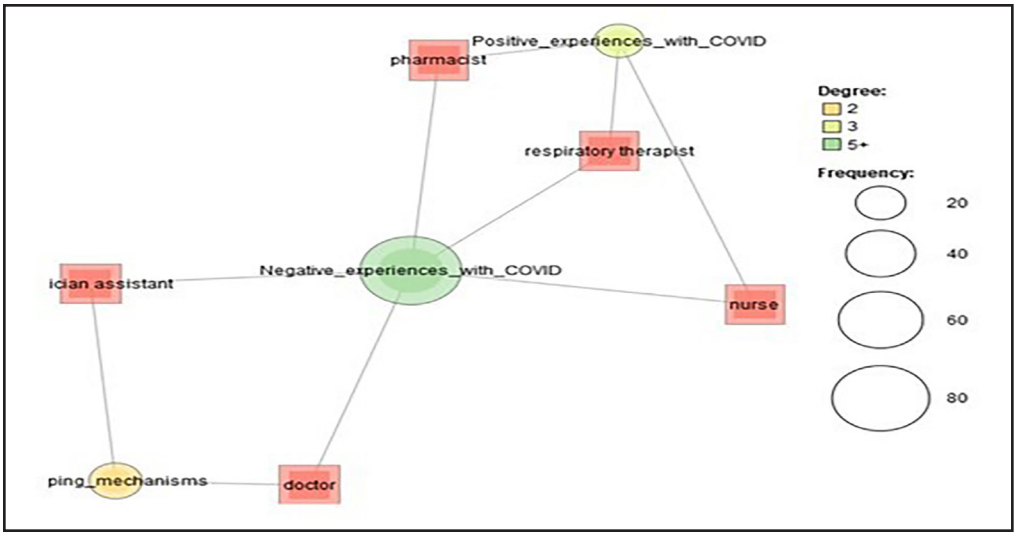

Figure 6. *Co-occurrence network of codes showing the relationships between select codes (positive experiences, negative experiences, and coping mechanisms) with the variable of occupation.*

Negative experiences with COVID were a major focal point in this research, but respondents' positive issues during the pandemic made for an unexpected comparison. These positive experiences with COVID also had an interesting relationship with negative experiences with COVID and with coping mechanisms for mental health **(Figure 6)**.

The accumulated data fit well with all the original research questions, although there was little mention of challenges the healthcare workers had with their physical health during the pandemic. Prior to the research there was the anticipation of respondents mentioning being physically "rundown" or that they caught COVID and it left lasting effects, but none of the respondents had such issues. Based off this research, healthcare workers are particularly at risk for the mental health issues that the COVID-19 pandemic has exacerbated, such as anxiety and depression. Although these words were surprisingly low on the Word Frequency List, this was a major theme in the responses. One recommendation would be for more focus to be put on healthcare workers' mental health during this time. This research suggests further research in how healthcare workers are faring during this stage of the pandemic, as much of the current research has been done on the preliminary outbreak and many of the challenges healthcare workers face have evolved. Also, considering the small sample size that included one representative from each occupation or perspective, research on a larger scale would hold more validity and be able to answer the questions more accurately on how society can better help people in this field.

Resources

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Reconciling Reader Response and Feminism in Late Twentieth-Century Erotic Historical Romances

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Abstract

In the 1972, the romance novel genre caught up to the sexual revolution with the publication of Kathleen Woodiwiss' The Flame and Flower. *The novel's explicit depiction of sexual scenes and erotic tension launched a new and highly popular sub-genre, the bodice ripper. The novel's commercial success during the simultaneous expansion of the women's right movement seems contradictory. Second-wave feminism scoffed at the genre's heroines, depicted in traditional gender roles as subservient females and pressed into sexual encounters. However, analyzing the responses of a group of dedicated romance readers to the genre in the context of Betty Freidan's concept of the "feminine mystique" reveals a coexistence of the genre's patriarchy and the readers' interpretation of feminism. The reader of bodice rippers the 1970s embodied Friedan's mystique: They were restless in traditional female roles as housewives but didn't necessarily embrace the alternative experiences feminism offered. The genre's transformation of a brutish erotic dark lover into a perfect, loving husband through the quintessential tenderness, caring and nurturing power of the heroine both transgressed but also ratified the readers' traditional preferences of femininity. Overall, the readers found the novels reaffirming that women could gain agency and power within their traditional female role.*

In 1972, Kathleen Woodiwiss' *The Flame and the Flower* burst into the commercial romance genre and changed its path. Romance novels from *Pamela* by Samuel Richardson in 1740 through the Harlequin novels of the 1960s skirted sexual scenes with either suggestive language or staged them off-scene entirely. Not so for *The Flame and the Flower*. Woodiwiss infused her text with graphic, sometimes aggressive sexual scenes, including rape as the central couple's first encounter. Rosemary Roger's *Sweet Savage Love* followed in 1974, in which an antagonistic attraction between the characters spills into many explicit sexual scenes. Similar to *The Flame and the Flower*, the female protagonist is also subjected to violent rape and sexual abuse by other men. These novels started a new sub-genre: the bodice ripper. The male dark lover character was not a new idea, but explicit, forceful sex scenes including rape were different, and curiously, female readers could not get enough. *The Flame and the Flower*'s original print of 500,000 copies swelled to 1.2 million by 1974 (Turner 43).

At the same time these and other books in the same genre soared on the bestseller lists, the women's rights movement was gaining new ground. The previous decade saw several legislative changes such as The Equal Pay Act of 1963 and the Civil Rights Act of 1964. Women now had legal protection in the workplace. Culturally, feminism moved into its second wave, examining women's equity in all aspects of life, including previously male-dominated worlds such as education or professional jobs. So why were some women during this time fighting for equality while others were immersing themselves in stories where women were sexually victimized by a patriarchal culture then under siege?

This paradox speaks to the fitful and sometimes contradictory ways some women experienced feminism during the 1970s, especially older middle-class white women. While they may have agreed with feminists like Betty Friedan that conventional domestic roles may have left them feeling unfulfilled, they were nevertheless still invested in the promise of power latent in these older models of femininity. The new eroticism of bodice rippers seems to have satisfied both these competing sentiments: The escapism and the taboo sexuality provided an alternative to the gendered parameters a patriarchal society imposed on readers' lives, but the heroines' ability to transform their rapists into domestic partners through nurturing and compassion idealized and validated the power that domesticity allegedly promised their readers.

In the *Feminine Mystique* (1963), Friedan explores why women who appeared to have achieved the historically desirable female roles such as mother and wife still felt they were missing something in their lives. She explains how post-World War II American culture told women they "could desire no greater destiny," urging them to "seek fulfillment as wives and mothers" (Friedan 15). Friedan called this allure of domestic bliss the "feminine mystique."

Implicit was the belief "that the highest value and the only commitment for women is the fulfillment of their own femininity," "to accept their own nature," and seek fulfillment in "male domination, and nurturing maternal love" (Friedan 43). However, Friedan finds the "mystique" lacking in its promised fulfillment. Some women of this time who believed in the appeal of the mystique felt a missing element in their lives and ultimately realized that "I want more than my husband and my children and my home" (Friedan 32). One community of readers found some fulfillment in the bodice-rippers.

Scholar Janice Radway documented evidence of this phenomenon in the tastes and preferences of a group of Midwestern women readers in her 1984 book *Reading the Romance: Women, Patriarchy, and Popular Literature*. The readers, whom she dubbed the Smithton Readers, were led by "Dot" (a fictitious name), a bookstore clerk who wrote a newsletter and often worked with publishers as a market analyst. Most were homemakers, and at the time of the study, their experiences seemed to mirror the disappointment that Friedan said characterized the feminine mystique. For example, in response to Radway's interviews and questionnaires, the Smithton readers said they read romances novels to escape their "particular pressures and tensions in their daily round of activities," which, for most, were related to their domestic routines (86). However, it is important to recognize the distinction that these women were drawing between this sense of unfulfillment and the promise of happiness and authority they still believed spousal and maternal roles inevitably offered for women. These readers were clear that the escape that romance novels offered was not from their husbands and children, but from the "psychologically demanding and emotionally draining task of attending to the physical needs of the family," to which they believed "females are especially and naturally attuned" (Radway 92). In other words, the Smithton readers experienced Friedan's problematic result of the mystique; they achieved all a woman could allegedly want, yet they still desired something else—different but, at the same time, similar.

Romance novels, especially the bodice rippers, vicariously filled the absences in the lives of women like the Smithton readers because of the predictable conventions of the genre, which were both sexually sensational and reassuringly domestic. The Smithton women preferred the heroine be characterized as a "true woman, one who possesses all the nurturing skills associated by patriarchal culture with the feminine character" (Radway 127, 128). It was these traits that precipitated the dark lover becoming a tender husband, a plot arc that involved "securing the complete attention and devotion of" the male hero via "transformation of an inadequate suitor into the perfect lover-protector" (Radway 214). In turn, the dark-lover-now-respectable-husband facilitated the heroine's own "achievement of sexual and emotional maturity" within the socially appropriate boundaries of monogamous domesticity

(Radway 127, 128). These standard plots and characterizations reaffirmed the transformative power of traditional notions of femininity, albeit in a more titillating fashion. The qualities of the heroine in the romance novel reflected the traits the homemakers ascribed to themselves in that their lives centered on the home and care of men and (future) children. They consequently returned to the romance novel again and again for escape, validation, and affirmation of a woman's role in the perfect romance. For the Smithton readers who experienced what Friedan recognized as disillusionment with the feminine mystique, romance novels thus provided a way for these women to reconcile themselves to its elusive promise by dramatizing an agency that Friedan denied the mystique—the power of conventional norms of femininity to transform a rapist into a husband and a woman into a sexual agent.

The Flame and the Flower, the path-breaking example in this genre, represents these conventions and their social and psychological implications for women like the Smithton readers experiencing the tensions of the era. In the beginning, its self-assured hero is contemptuous of true love. Brandon mistakes Heather for a prostitute, and the latter, stunned by an earlier attack by another man, is "too surprised to resist" Brandon's kisses. Laboring under his mistaken assumption, Brandon then rapes her (Woodiwiss 33). However, the moment he realizes she was actually a virgin, he "touched her cheek tenderly" and "moved against her gently, kissing her hair and brow" (Woodiwiss 34). The next morning, Heather's "soft and delicate beauty" prompts him to rape her again, and he takes her struggling as "spirit," not a lack of consent (Woodiwiss 39). Completely immersed in his patriarchal culture, the hero assumes only a prostitute would be out on the streets at night alone, not an innocent woman, and takes what he believes is offered without question. However, the intervening moments of tenderness Brandon displays allowed women like the Smithton readers to interpret the rape as not "an act of aggression," but as "a misinterpretation or [that he] finds her irresistible" (Radway 141). In fact, the only discomfort with the rape scenes that Radway observed in the Smithton Readers' was their apparent surprise at the "hero's inability to discriminate between innocent or experienced female characters" (Radway 142). They could accept "a little forceful persuasion" as long as it is carefully controlled and either attributed to the heroine's irresistibility or "clearly traced" to the hero's passion or jealousy (Radway 75–76). On one hand, this initially removes female sexual agency from both the heroine and the reader and places it the hands of men, which coincided with established gender norms, but it also provided a point of contrast for the female character's own erotic transformation. On the other hand, and even more important than the sex or rape scenes in these novels, was the power of conventional feminine characteristics to change the behaviors that led the men to rape the heroines in the first place. Sensationalism aside, this was the appeal of the genre to the readers.

According to Radway, the allure lies in the journey of the protagonists and the triumph of love. In *Fantasy and Reconciliation: Contemporary Formulas of Women's Romance Fiction*, Kay Mussell defines three domestic "tests" all heroines of romance novels must face: the wife, the mother, and the homemaker. Passing these tests makes them worthy of capturing Mr. Right and completing his transformation (Mussell 89). All three of these tests measure a level of nurturing, a feminine characteristic. In the dark lover romances, Mussell argues that the hero must guide the heroine in achieving her "transition from childhood to adulthood" as a fully realized woman in character and sexuality (Mussell 117). In many novels the sexual transition often begins with forceful seduction in which the horrified heroine fights not only the hero's advances, but her own hints of desire. Eventually, she gives in to her sexual awakening and develops an appetite that matches the hero. For the Smithton readers and other women who experienced the sense of dissatisfaction that Friedan discussed, still saw domesticity as desirable; the complementary triumph of the heroines' traditional nurturing and new-found sexual confidence assuaged their anxiety by suggesting that what was required for happiness was a comparatively incremental (and erotic) change to conventional femininity rather than a feminist revolution.

In *The Flame and the Flower* there are several bath scenes that demonstrate Heather's progression in Mussell's tests. Brandon's first rape of Heather results in pregnancy and the couple reluctantly marries, so Heather must acclimate herself to the role of "wife" and "mother." The act of bathing someone can be intimate and nurturing, in some ways, a maternal trait. Early in the novel, Heather snaps at Brandon in anger. To punish Heather for her insolence and remind her of her place as his wife, Brandon insists that Heather bathe him. In response to his demand, she "could do nothing but sputter and spew and turn bright red" and then "scrubbed hard, venting her anger into the strokes that she used" (Woodiwiss 111). But when it comes to washing his lower torso, she stops out of modesty and embarrassment. Brandon reminds her in a gentle tone, "If I chose, you know you will do it, don't you?" She closes her eyes in agony and nods her head. "'Yes,' she whispered miserably, tears falling freely now.'" (Woodiwiss 112). Brandon relents and Heather reminds herself that she must be an obedient wife. Several moments later as they leave to join guests, she "managed a timid smile when he slid his hand behind her back to her waist" (Woodiwiss 112). The evolution of Brandon's character—from trying to humiliate his wife to the tenderness he later displays—shows both his capability of being a better man and his assertion of his role as the patriarch who Mussell says must guide the heroine to achieving her female adulthood, validating her life (Mussell 114). Later, in another bath scene, after Heather admits to herself that she has fallen in love with Brandon, her attitude to his bath is much different: "Brandon eased himself into the hot

water and lay back for some moments relaxing in it. When he finally sat up and began to scrub, Heather came and reached for the sponge. She dipped it into the water and held it expectedly but waited for his approval. He gazed up at her a long time…then leaned forward, presenting his back to her" (Woodiwiss 286). She passes her domestic tests by developing a nurturing attitude to the dark and brooding Brandon, soon winning over her hero. In contrast to the sense of loss that Friedan said accompanied women's deferment of their own will and desires, Heather embodies the feminine mystique that the romance reader recognizes in an ideal heroine and identifies with as a reflection of their own lives as homemakers or an aspirational version thereof.

Mussell's redemption arc of the hero also occurs in *The Flame and the Flower*. Brandon is forced into the marriage which dooms Heather into spending her life with a man she fears. Due to conflict and plot twists, the couple does not have sex throughout Heather's pregnancy despite many passionate kisses and embraces and a growing affection and tenderness for each other. After the birth, they go horseback riding and share a kiss: "He lowered his head and his mouth moved over hers hungrily and seemingly by magic Heather turned in his arms and melted more closely to him" (Woodiwiss 323). But a storm interrupts their embrace, forcing them to return home. By that evening, Heather, stiff and sore from the ride, dashes Brandon's hopes for a passionate night: "Brandon stood grinding his teeth, telling himself over and over it was simply not gentlemanly to take a woman in this condition, especially one's own wife" (Woodiwiss 329). And then "much to the disappointment of his alter ego," he leaves Heather peacefully asleep and takes a cold bath in the nearby creek (Woodiwiss 329). Not only does he refrain from forcefully seducing her as he did in their first encounter, he now recognizes Heather as a wife and treats her with due respect and tenderness. Domesticity leads Brandon to reject his earlier dark inclinations. This transformation completes the perfect lover-arc of the novel, affirming to the reader that a woman who is both nurturing and sexually confident achieves the highest ostensible reward—a respectful spouse.

The Flame and the Flower broke new ground with its explicit sexual scenes. Radway says the novel opened the door to "treat their heroines as sexual creatures capable of arousal and carnal desire" (Radway 73). And indeed, it did. From Heather's first "vague feeling of pleasure" at Brandon's kisses before the rape to a much later scene where Brandon's lovemaking makes her "a wild thing, quivering, biting, clawing at him," Woodiwiss infuses eroticism into the narrative, page after page (389). Friedan's research finds that women of the mystique were preoccupied with sex. She argues that sex was the "only frontier open to women who have always lived within the confines of the feminine mystique" (Friedan 261). Since "larger goals and purposes" had been blocked by women living the mystique, sex filled the vacuum

or discontent and the American media responded to the hunger in movies, magazines, and novels (Friedan 261). In contrast, Radway's readers appeared reluctant to "discuss in any detail whether they themselves are sexually excited by the escalation of sexual tension" (Radway 67). However, they list *The Flame and the Flower* as their favorite novel with its many erotic scenes. While the novels use of euphemisms such as male hardness and soft core abounds, it was sex with rose-colored romance lenses. This apparent paradox represents the Smithton readers' need to reinforce their recognized gender role as defined by the mystique, yet echoes Friedan's claims about women's appetites for sexual experiences. But the readers were very clear that the sexual content in what they labeled "a good novel" was linked to "romantic love" and monogamous relationships (Radway104). In contrast, the Smithton readers designated Rosemary Rogers' *The Insiders* (1979) as a "bad" romance. With is contemporary setting, it tells the tale of a power couple in the TV media industry. *The Insiders* includes much more graphic language and sexual scenes—the heroine takes multiple lovers, there are episodes of anal sex, and gang rape—which the Smithton readers defined as "pornographic" (Radway 165). But *The Insiders*' true failure in terms of satisfying the expectations of the Smithton readers was its ending. Only a few pages from the end, the hero rapes the heroine in a particularly humiliating way, and then, suddenly, realizes he loves her. To the Smithton readers, there is no gradual or believable change in the hero, so the declaration of love and transformation is unearned and therefore rejected by the readers. The power of a woman's mystique ostensibly fails in the pages of the novel.

While Smithton readers' denial of the titillation of the sexual scenes may seem disingenuous, it does reflect a paradox that other women of their time expressed. Alice K. Turner in a 1978 *New York Magazine* article titled, appropriately, "The Tempestuous, Tumultuous, Turbulent, Torrid and Terribly Profitable World of Paperback Passion" asks "What does this all mean, this fantasy of romantic ravishment?" (Turner 47). Perhaps a clue lies in Nancy Coffey's discovery of *The Flame and the Flower*. Coffey was the Avon Books senior editor who culled the slush pile for something to "get her through one potentially unendurable weekend" (Turner 48). The affirmation of the ideal romance with its "transformation of a rogue into the perfect lover-protector and the heroine's discovery of her sexuality" was a powerful fantasy for women to help them "get . . . through" this turbulent era of gender politics (Radway 214). Turner questioned whether the explosion of new erotic novels was due to a "backlash, an anti-liberation fad" or perhaps "exploitation of women's new demands for sexual fulfillment" (Turner 48). Her article left the question open-ended with the classic pun on the mystery of what women want, but the Smithton readers' response suggests both could be true at the same time. Romance readers struggling with the apparently opposing views of traditional sexual roles and

demanding equal rights for women could find dramatizations of women who attained agency and a greater measure of relationship equity through domesticity and sexuality.

Feminists may argue the erotic romance readers were perfect representations of Friedan's mystique and the romance novels only perpetuated the mystique, closing the door to female growth and exploration of paths other than traditional gender roles. Radway agreed that a female reader of a story where the heroine finds her identity and awakened sexuality through the guidance of a male may be teaching themselves domestic roles as the only route to fulfillment (Radway 187). However, the Smithton readers themselves suggested this was a false dichotomy, arguing that romance reading was a "declaration of independence" as they take time from their daily duties as wife and mother for themselves as they sink into a fictional world (Radway 213). They declared romance reading as a form of female agency. The novels chronicle the transformative ability of traditional woman's roles and female triumph in a patriarchal world. For the Smithton readers, the closing of Heather and Brandon's tale aligns the heroine's journey with their belief in the power of feminine roles: "To the world they seemed frail and in need of protection, but their love gave them greater strength and courage than was believable" (Woodiwiss 430).

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