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SUURJ



5
VOLUME

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Dr. Molly Clark Hillard

Designer

Caleb Hou, '14

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Katie Howard

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Welcome to *SUURJ*: Celebrating its Fifth Year!

Welcome to the Seattle University Undergraduate Research Journal (*SUURJ*). Through the hard work and collaboration of student editors, organizers, advertisers, and fundraisers, we have achieved a fifth volume of our journal, and we are thankful for the contributions of university students, faculty, and administrators. Beyond simply a journal, *SUURJ* is a publication made to amplify students' voices and insights beyond the classroom into wider conversations; it is also an opportunity, providing both authors and editors with valuable professional experience. Although we were challenged by the context of the COVID-19 pandemic and interacting entirely through virtual means, *SUURJ* Volume 5 has come together, and we are thrilled to present the product of our year-long collaboration.

This year's volume is a poignant curation of student research across a variety of fields of study, from microbiology and game design to the cultural renaissance and the impacts of refugees. Each year's selection is a careful deliberation that seeks to balance disciplinary and methodologically diverse content with relevant theses that engage broader issues in important and insightful ways. In being an online journal, we have the benefit of bridging students' research into larger conversations at a global scale. Although *SUURJ* is a small journal, the process of its creation has been immense, from our training, to the selection process, to copyediting, to publication assembly. We feel it is this hard work and dedication that have brought us to where we are: with our fifth volume, and one that we are proud to showcase. While *SUURJ* does not choose annual themes for its volumes, natural patterns and rhythms will often occur. This year, we noticed surfacing themes of boldly confronting injustice at the environmental, social, and humanitarian levels.

As the fifth team to embark on this journey, we have had the gracious leadership, compassion, and insight of Dr. Molly Clark Hillard, who ran the entire practicum. It has been a turbulent journey from beginning to end, but being the experienced captain that she is, Dr. Hillard guided us through our stresses and uncertainties until we reached the final stretch, with moments of laughter, fun, and creativity illuminating the culmination of our work. The challenges created by the pandemic pushed us to grow, adapt, and innovate, leading us to a publication that we feel has not only met those challenges, but reflected the context of our world and the concerns which swirl about it. We have the collective effort of our cohort, leader, and contributors to thank for that.

SUURJ Volume 5 encountered a rich pool of submissions, perhaps a reflection of the need to bring issues to light, helped by the passions of students. It is, without a doubt, the

drive of inspired community members that has fueled the need for undergraduate research journals and created for students across disciplines an impactful platform. The need for diverse voices and issues is crucial, and it is our hope to elevate in order to provoke, to inspire in order to motivate, to start the conversation in order to begin change. We do that with the help of driven student research, the work of our student editors, and the participation of readers like yourself. So, in this milestone year of the journal, we thank you.

All Our Gratitude,
The *SUURJ* Volume 5 Student Editorial Team

A Note from the Chief Faculty Editor

It is hard to believe that it has already been five years since we launched our first volume with our first cohort of student editors and authors. It has been my honor to serve as the founder and faculty editor of this journal since its beginning in 2016 (with a year off for sabbatical, when the journal was in the very talented hands of Professors Tara Roth and Hannah Tracy). In a short span of time, *SUURJ* has gone from an idea to a thriving publication with a global readership. This success would not have been possible without the help and support of many people, among them our faculty advisory board; the financial and logistical sponsorship of the College of Arts and Sciences, Albers, Lemieux Library, and the University Core office; the many faculty who have encouraged their students to submit essays, our faculty content editors, our talented contributors, and four years of amazing student editors, who take on the mantle of *SUURJ* apprenticeship year after year with skill and grace.

It bears noting that this first cohort of editors found themselves deliberating on our first set of manuscript submissions the day after the election of Donald Trump in November 2016. In the midst of collective shock and grief, that editorial team marched into deliberation sessions with a laser-like focus and determination to create a first issue that would render clear their values as a team, give voice to students, and speak truth to power. That set of intentions has stayed with *SUURJ* for all five of its issues. This year, in November of 2020, our new crop of editors once again entered the deliberation process with a presidential election hanging in the balance. They, too, set the task for themselves of selecting a set of essays that speak to justice, repair, and hope in bleak times.

Watch this space for new and exciting directions for the journal in the future as we *SUURJ* forward into the next five years!

Yours in the service of great prose and ethical editing,
Molly Clark Hillard, PhD
Department of English
Chief Faculty Editor for *SUURJ*



News and Notes

This section is intended to briefly showcase exciting projects emerging at Seattle University, some in collaboration with faculty, others independent.

Knotris: A New Game

**Allison Henrich, Alexandra Ionescu, Brooke Mathews,
Isaac Ortega & Kelemua Tesfaye**

In 2019-2020, we began our knot mosaic research, sponsored by the Center for Undergraduate Research in Mathematics (CURM). To build the intuition to ask meaningful questions, we played with wooden knot mosaic tiles, created by Lew Ludwig for the UnKnot Conference, together with acrylic tiles that we created. We expected to make conjectures and prove theorems typical of pure mathematics research. Instead, while playing with tiles in our Seattle University dormitory, Chardin Hall one day, our play ignited a spark that inspired us to develop Knotris, a Tetris-like game that uses knot mosaic tiles instead of tetrominoes.

Let's begin by introducing some knot mosaic vocabulary. A knot mosaic is a rectangular configuration created using the 11-knot mosaic tiles (Figure 1), and can be used to represent any knot (Figures 2 & 3). A knot mosaic is a rectangular configuration created using the 11 basic-knot mosaic tiles (Figure 1), and can be used to represent any knot (Figures 2 and 3).

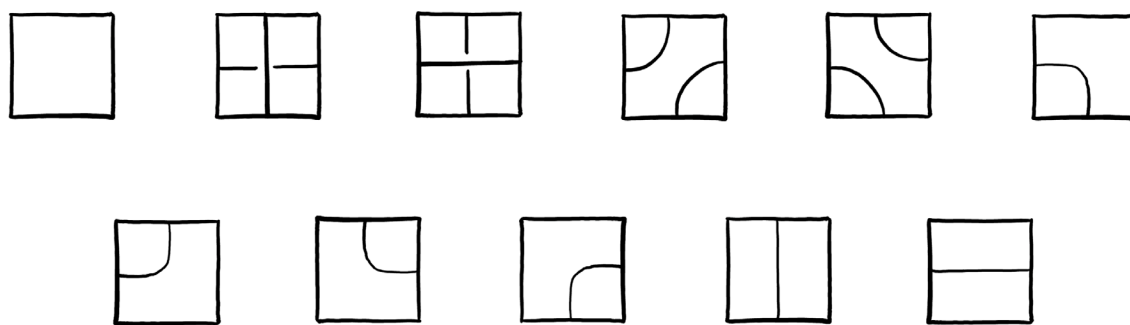


Figure 1 Eleven-knot mosaic tiles.

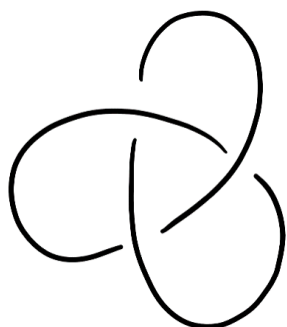


Figure 2 The knot diagram of a trefoil.

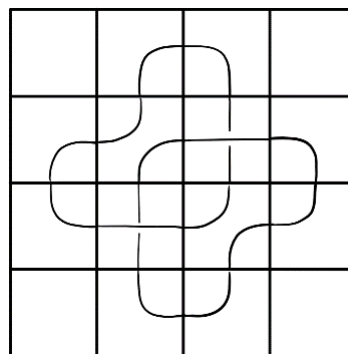


Figure 3 The knot diagram of a trefoil.

A connection point is present along any edge of a tile that a strand passes through (Figure 4). We can say a tile is “suitably connected” when each of its connection points touches a connection point of a contiguous tile.

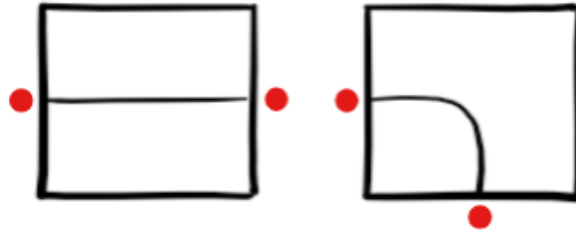


Figure 4 The connection points of a line and elbow tile indicated by red dots.

To inform our game design we drew from the classic video game, Tetris. In the rules of the game, a single tile falls at a time and can be rotated; the game has hold and drop tile features; the score increments when a row is cleared; and the game ends once a tile is placed beyond the height of the board. Beyond these parameters our game development was primarily guided by knot mosaic theory, probability analysis, and the intuition we built through play. In fact, intuition played an important role in determining what distribution of tiles would be supplied to the player. While playing with physical tiles, we found the seven-tile bag composed of one blank tile and two elbow, four-connected, and line tiles led to the most natural gameplay (Figure 5). Thus, we decided that tiles would be supplied to the player from a shuffled gamebag composed of three seven-tile bags, and upon emptying the gamebag would reset.

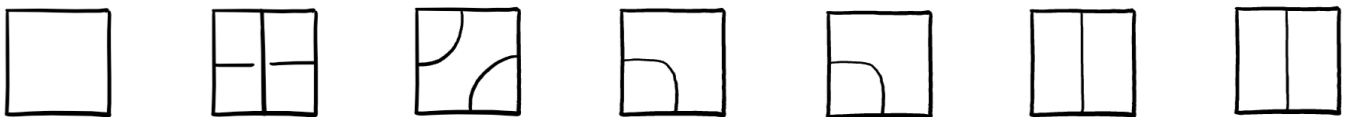


Figure 5 The seven-tile bag.

We can extend the definition of suitably connected to a 1x6 mosaic, which is a row in Knotris. Since we wanted more precise vocabulary to describe game states in our game, we expanded the definition of a suitably connected row to occur when two conditions are satisfied; the first is that a row is internally suitably connected, meaning that each of the connection points on an internal edge is satisfied (Figures 6 and 7). The second condition is that a row is externally suitably connected, such that the connection points along the upper edge of the row are satisfied by the row above it (Figure 8).

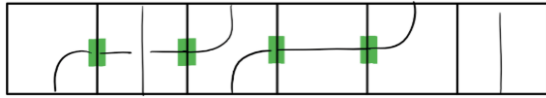


Figure 6 An internally suitably connected row.

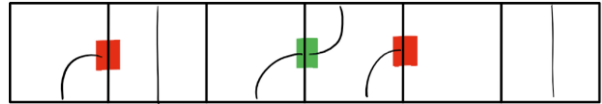


Figure 7 A not internally suitably connected row.

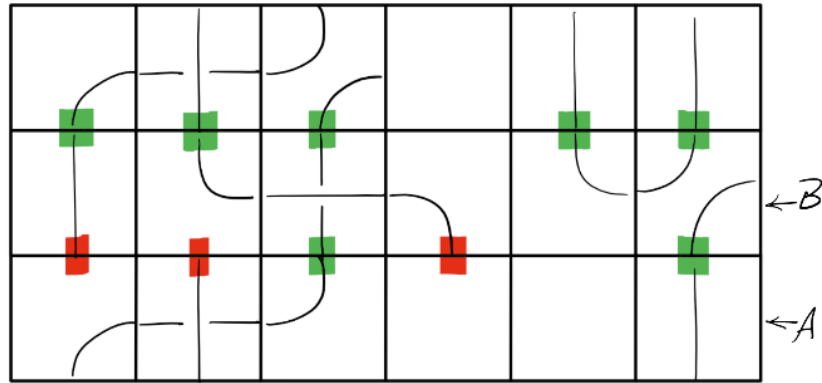


Figure 8 A knot mosaic where row A is not externally suitably connected, and row B is externally suitably connected.

To accrue points in Knotris the player must assemble suitably connected rows. If a row is placed such that it is internally suitably connected and not externally suitably connected, that row will remain on the board until a row is placed such that it is externally suitably connected. However, if a row is not internally suitably connected then that row and any rows below it that are not externally suitably connected to it will remain on the board for the duration of the game (Figure 9).

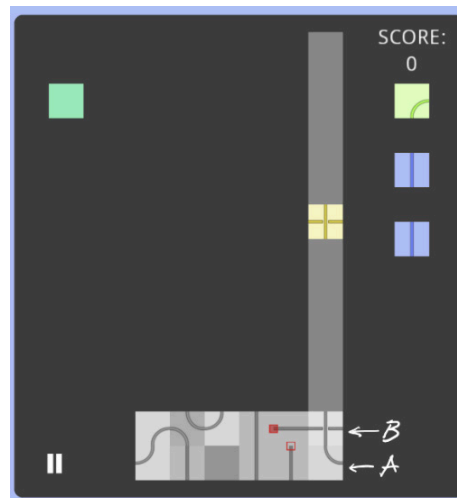


Figure 9 Row B is not internally suitably connected and row A is not externally suitably connected, so rows A & B are “stuck” on the board.

When a row clears, the score increments by 100 times the sum of the multiplier of each tile in the row. Initially, all tiles have a multiplier of one, but a player can increase the multiplier by creating knots and links or clearing multiple rows at once (Figure 10).

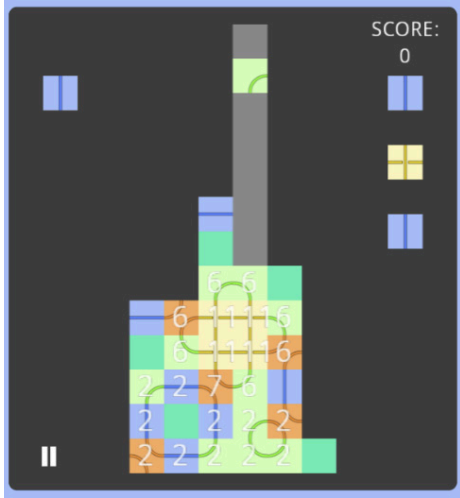


Figure 10 An example of increased tile multipliers by creating knots.

After we finalized the framework of the game, we wanted to know how challenging it would be to play, so we explored the tiles as combinatorial objects. We investigated how difficult it would be to fill holes on the board given varied assumptions about our tiles. This revealed how challenging it would be to clear rows in different game states, and this informed our strategies for gameplay. We spent weeks calculating the probability of filling one-, two-, and three-tile holes by hand drawing probability tree diagrams (Figure 11), which we later automated for more complex hole types and boundary conditions (Figures 12 and 13). We also evaluated the frequency of unique rows that could satisfy a given row boundary condition using our gamebag, and this provided additional insights into game strategies.

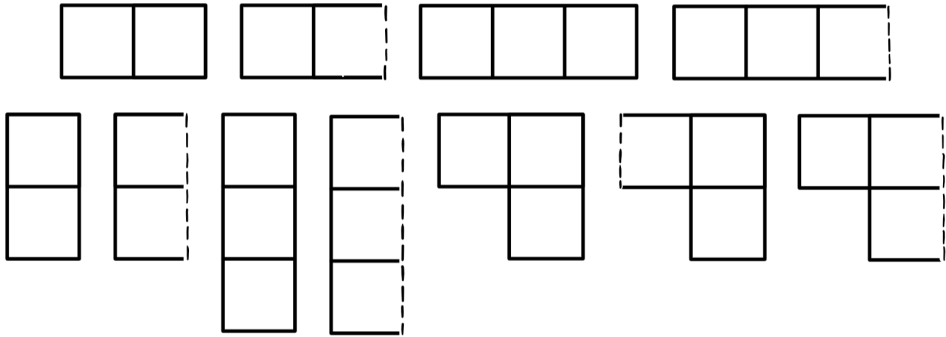


Figure 11 Examples of the two- and three-tile holes we analyzed. The dotted edges indicate there is no constraint on the edge.

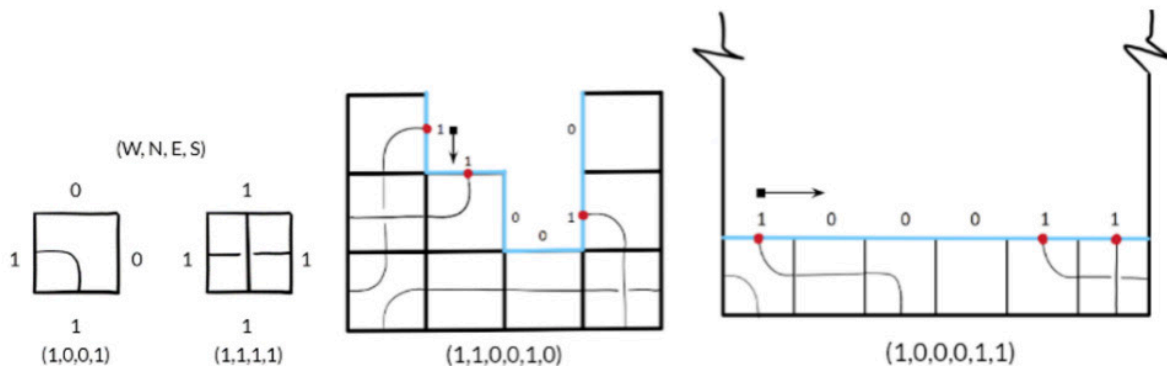


Figure 12 A boundary condition is the trace of the external edges of a tile, hole, or row. It is represented by n -tuples of 0s and 1s where 0 indicates there is no crossing point along the edge, and 1 indicates there is a crossing point along the edge.

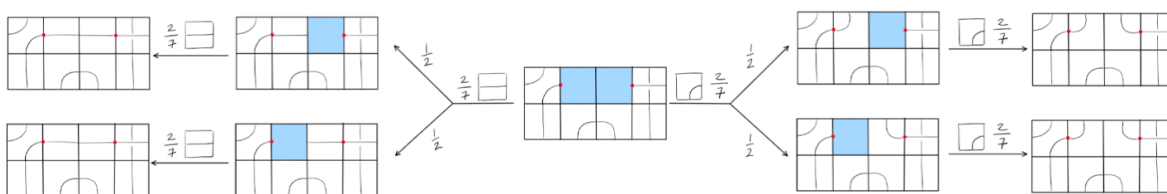


Figure 13 An example of the probability tree of a 1×2 hole with the boundary condition $(1,0,0,1)$.

You can play Knotris at <https://izook.github.io/knotris/>. Be sure to fill out our feedback form: we would love to hear what you think! To learn more about the mechanics of the game and about knot mosaics, you can read our Math Horizons article, “Knotris: A Game Inspired by Knot Theory.” We would like to thank our collaborators at Bellevue College, Jen Townsend, Eden Chmielewski, Andre Dennis, and Kellen McKinney for a wonderful research experience; SUURJ for providing a platform to share our work; and CURM for funding our research.

Reference

Henrich A, Ionescu A, Mathews B, Ortega I, and Tesfaye K. 2021. KNOTRIS: A game inspired by knot theory. Math Horizons. 28(2): 8-11. DOI 10.1080/10724117.2020.1809238



Core and University Honors Writing

We feel strongly that to capture the spirit of Seattle University, and to convey that spirit to an international audience, *SUURJ* should include writing from the Core, as well as from University Honors. We offer lower division writing as its own section for several reasons. First, we want to introduce these programs to an audience outside the campus community. Second, because students in these programs are not necessarily majors in the field for which they are writing, and because they are often first- and second-year students, we do not want to assess their writing in the same way we do essays by upper-division majors. Finally, Core courses are often interdisciplinary, or they engage in assignments that are less-traditionally contoured than research projects in the majors, so in choosing them, we employ a different mode of evaluation. We offer the Core and University Honors Writing section as part of our celebration of writing at all stages of students' undergraduate careers.

Inclusion and Exclusion in Medieval European Craft Guilds

Sahil Bathija, Political Science

Faculty Mentor: Randall Souza, PhD, History

Faculty Content Editor: Kendall Fisher, PhD, Philosophy

Student Editor: Katherine Howard, English

Abstract

This essay examines the effect of European craft guilds on early European society. Specifically, it focuses on guilds' impacts on women, Jews, and its own members. This historical analysis overwhelmingly finds that while European craft guilds fostered community for their members, they had the opposite, dividing, effect on excluded non-member populations. For members of a craft guild, participation meant access to expanding opportunities and greater social status and mobility. Guilds ensured members fair wages, equal chances for success, advancement of skills and social status, and a sense of stability. Guilds acted much like a social network, hosting a wide variety of activities that fostered cohesion and cooperation. Evidence indicated that some women were able to participate in guild life, though the scope of that participation was quite limited; Jews were barred from guilds entirely. Because guilds reserved the rights to certain skilled trades, Jews and women were denied many potential livelihoods. The essay ultimately explores the historical implications of such guild inclusion and exclusion.

Introduction

The role of agricultural surpluses in the eleventh century, among other lesser factors, made the Commercial Revolution possible (Lopez 56). The excess of food during this period, lasting until the mid-eighteenth century, liberated laborers from mere daily subsistence at the behest of lords, and provided many with time for other endeavors. With the advances of the Commercial Revolution came guilds, which can be defined as “an association of people engaging in the same activities and wishing to pursue shared purposes” (Ogilvie 3). The scope of this paper specifically investigates European craft guilds (rather than the prominent merchant guilds or guilds outside of the European continent), exploring the role they played in advancing or impeding an individual’s social and economic progress. These advancements included community building, skills training, quality standards, social activities, beneficial marriages, and occupational security, among others. This paper seeks to mediate the popular narrative of the revolutionary and profuse societal benefits attributable to the formation of medieval European craft guilds. By looking more comprehensively at guilds’ relationships with its members, with women, and with Jews, we will discover that the formation of European craft guilds fostered social and economic prosperity for its members but hindered the advancement of excluded non-members.

Master-Narrative: The Benefits of Guild Life

To understand the origins of this overly simplified narrative, we must recognize what life was like before the growth of guilds. During this period in medieval Europe, the feudal system of governance rigidly confined people to their social ranks, limiting opportunities. The lowest ranks were often restricted to arduous agricultural labor, and all levels of the social hierarchy were dependent on others above or below them (Lopez 48). When populations began to coalesce into towns, the formation of guilds provided desirable opportunities to those that would otherwise have few. As Robert S. Lopez notes, the change gave serfs and other peasants an avenue toward freedom and escape from feudal control (124). Specifically, for many new craftspeople, the formation of guilds alongside the Commercial Revolution meant “more food, better communications, relief from the worst forms of personal bondage, some labor-saving devices, and, above all, expanding opportunities” (Lopez 125). Guilds made their members feel like they were in a fair and even-handed community because, despite the hierarchies within them, guilds ensured an “equal chance of advancement and success” (Lopez 126); for example, the procedure to go from an apprentice to a master was the same for every member of that guild. Through such apprenticeships, guilds also diffused knowledge to foster training and skills among its members for mutual prosperity (Epstein 684; Cave and Coulson 249). Additionally, Robert Lopez notes, “it was fairly easy for [...] a master to enlarge

his staff, [and] for an apprentice to qualify as a master” (127). This supposed ease gave many individuals fair access to guilds along with the community and advantages that came with it. Furthermore, the quality standards that guilds enforced led to increased revenues for the many occupations they represented (Epstein 686). Craft guilds made their members feel secure in their occupation and future.

After members satisfied their essential needs of basic subsistence, they looked to guilds to fulfill their societal needs. Guilds were essentially multifaceted social networks, valuable in building community and a sense of belonging (Ogilvie 18). Guilds used their membership dues and admission fees to fund a variety of social activities, like meetings and parties, to strengthen inter-member bonds (Lopez 128). Many guilds went so far as to require attendance to assemblies, banquets, and feasts to further social capital (Ogilvie 19). Some guilds organized funeral ceremonies for members and their families and required all members to attend—including the funerals held for a member’s slave (Ogilvie 19). Similarly, guilds fostered solidarity through cultivating new familial bonds, as families belonging to the same guild often intermarried (Ogilvie 23). Some guilds, such as the one described in *The Shearers’ Charter of Arras*, punished those who did not generally favor their fellow members over non-members. In the Flemish textile industry, regulations state that “whatever brother of this Fraternity shall betray his confrère for others shall not work at the trade for a year and a day” (Cave and Coulson 252). These actions were motivated by a desire to cultivate mutual cooperation, collective action, and fair norms within their occupation (Ogilvie 23). Overall, guilds advanced collaboration and belonging for members in order to promote their interests.

Guilds also reinforced religious bonds. It is important to note that a majority of guilds were located in cities, and many cities were centered around castles or churches (Rosenwein 160). With religious institutions already an essential part of the community, many guilds reinforced this unity by holding their assemblies in religious buildings such as convents or churches or by practicing religious observances together (Ogilvie 21). Furthermore, some guilds directly dedicated themselves to saints; for example, the Shearers of Arras Guild was “founded in the name of the Fraternity of God and St. Julien” (Cave and Coulson 250). Reinforcing religiosity in this way further united guilds in a community of common beliefs and shared values.

Access Denied: Entry Barriers to Guilds

While there is evidence that guilds benefited many in society, there is also contrasting proof that guilds were exclusive and restrictive for particular groups. When Lopez said it was easy to join a guild, he was referring to privileged Christian men. Statistical analysis of the inhabitants of medieval European households suggests that many guilds served as “exclusive

organizations for relatively well-off, middle-class men” (Ogilvie 14). Guild regulations show that many guilds “discriminated against women, poor men, Jews, Slavs, [Romani], migrants, people they defined as ‘dishonourable’ [sic] or ‘untouchable’, and members of minority ethnic, linguistic, and religious groups” (Ogilvie 7). These statements show that one must question who specifically benefited from guilds, and who was left out or harmed.

Evidence of this discrimination is codified through the entry barriers craft guilds employed. These barriers fell into four predominant categories of exclusion: group affiliation, demographic characteristics, economic characteristics, and collective acceptability (Ogilvie 96-116). Ogilvie notes that these group affiliation barriers involved matters concerning local citizenship such as passing a citizenship test or proving local citizenship, a minimum period of prior citizenship, or proof of local residence. Demographic characteristics included choosing or barring guild applicants on the basis of age, marital status, legitimate birth, or familial ties with guild masters (Ogilvie 106-111). Economic barriers included minimum ownership of wealth or property, restrictions on those previously associated with another guild, and fees for such categories as apprentice admissions, mastership, or operating licenses (Ogilvie 116-126). Finally, collective acceptability requirements barred those who may have satisfied all other requirements by barring anyone from a “dishonorable occupational background,” those that could not prove a good reputation, and those who were not collectively accepted after their probationary period (Ogilvie 128-132). Any barrier that a particular guild chose to apply further divided people in society by excluding them from its membership and the advances that came with it.

Despite the scholarship claiming that many of these entry barriers were largely unenforced, the fact that guilds claimed exclusive rights suggests they still intended to restrict membership in some way (Ogilvie 133). Additionally, primary sources show citizens complaining about restricted entry (Ogilvie 134). Since often anyone who wanted a job in a craft had to first become a member of that guild, not being accepted into a guild had a significant economic impact (Ogilvie 86). The exclusion of outsiders likely agitated the discontent between those inside and outside a particular guild.

Women and Guilds

Medieval women had both mixed success in accessing a guild’s social and economic benefits. Some women were allowed to participate in guild life. The provost of Paris’ book of guild regulations regarding Parisian silk fabric makers is one example showing that women were involved in certain trades; it also demonstrates that they were subject to the same rules as men in advancing to the topmost position within a guild (Amt 162). The ability to become a mistress of a craft imbued women with a greater degree of agency, demanding respect by virtue of attaining the highest status within a guild, placing her above male apprentices or

journeymen. Furthermore, the regulations mandated quality standards and stated that silk-maker apprentices, who were most likely to be female, would receive a fair pay; this would prevent the head of that guild from taking economic advantage of them (Amt 162). Overall, because women were held to the same standards as men, many of the same features of guilds promoting social and economic advancement were available to women.

However, while certain guilds connected women, most others excluded them. Despite the Parisian silk-makers' guild example described above, evidence suggests that women faced intense discrimination and were largely excluded from guilds (Ogilvie 7). Certain guilds "adopted the hard-line position of the German jurist Adrian Beier who declared in 1683 that '[m]asculine sex is one of the indispensable basic preconditions for admission to a guild'" (Ogilvie 33). Even in guilds where women did have a role, men usually "were the ones who dominated the offices and set guild policies" (Rosenwein 219). In the silk fabric makers example, it was a male provost, Etienne de Boileau, who determined the regulations (Amt 162). So though some guilds fostered community and belonging for women, many more had the opposite social effect, solidifying distinct patriarchal roles by requiring male leadership or excluding women altogether.

Jews and Guilds

Jews were prohibited from joining craft guilds altogether (Rosenwein 223), and their exclusion was just one of many direct attacks on their potential for community and belonging in a Christian-dominated society. In addition, agricultural jobs were an unattractive alternative option because there was always the "possibility of sudden expulsion and the difficulty of obtaining help from Gentile hands" (Lopez 61). Barred from practicing any craft, the only two options available to a Jewish person were to become a moneylender or a long-distance trader. Long-distance trading was one of a very limited number of options for a Jewish person if they were residing along the Mediterranean. Sadly, those Jews who did become traders were at best "tolerated, but nowhere secure" in the Muslim and Christian societies in which they traded (Lopez 62). Exclusion from guilds exacerbated the distance and distrust in an already anti-Semitic time. With Jews absent on frequent lengthy travels for long-distance trade, we can postulate that many of their neighbors did not even consider them to be a part of the community in which they lived. This distance likely further fueled the insider-outsider divide and antipathy between a guild's members and non-members. Jewish people had the option of moneylending because it was an occupation from which Christians were prohibited. Sadly, their success in this field and other lucrative endeavors further increased their unpopularity (Lopez 62). In fact, as Rosenwein reports, one of the motivations to kill Jewish people was so that debtors would not have to pay back their debts (Rosenwein 233). The occupations that

Jews were forced into, partially due to guilds' exclusion of Jews, deepened resentment and increased the generalized fragmentation of guild and non-guild society members.

Conclusion

The heightened sense of community and belonging, as well as the access to social and economic advancements for members within a guild, was precisely part of the problem. As Ogilvie explains, guilds were so close-knit that everyone knew who was and was not a member (Ogilvie 6), and this closeness likely helped foment an insider and outsider mentality. The modern psychological term "groupthink" applies perfectly to this kind of situation (Ogilvie 6). Guild members were so invested in being a part of the group that they accepted ethically wrong or unjustified decisions, including mandating social penalties through collective action by "imposing ostracism on members who failed to discriminate against women or Jews" (Ogilvie 24). The guilds' fostering of community and belonging between members created the conditions necessary for discriminating against and excluding already marginalized people.

All in all, European craft guilds varied greatly across societies and their impact on the community varied as well. Those that were included in a guild enjoyed many benefits and were connected through various events. Guilds also ensured a member's livelihood by providing fair dealing, mobility within their hierarchy, and many opportunities for success. They increased business and brought in more customers by enforcing quality standards. Conversely, guilds imposed a plethora of entry barriers against groups such as women and Jews. While women were not barred from all guilds as the Jews were, their role in guilds was accepted in only certain cases; in most circumstances, a woman's role in a guild was either minimized or completely absent. Guilds fueled resentment against Jewish people and hindered social and economic advancement, chiefly their feelings of community and belonging. Jewish people were forced into moneylending or long-distance trade occupations which facilitated setting Jews apart from the wider society as a whole.

The mixture of community building and community exclusion in guilds deepened the divide between larger groups in European society. A guild's ability to fragment community likely had an immense effect on later historical processes and events, including the constant reinforcement of the male-dominated social class structure. Furthermore, the exclusion of Jews likely fed into the resentment demonstrated by the massacres of the People's Crusade in the eleventh century, and other occurrences such as the accusation of blood libel and the blame imposed on them during the Black Death. On the other hand, the equality guilds ensured for their members may have inspired others later in the industrial age to unionize for fairer pay and working standards reminiscent of guilds.

Works Cited

Amt, Emilie. "Townswomen's Lives." *Women's Lives in Medieval Europe: A Sourcebook*, Taylor and Francis, 2013, pp. 161-80.

Cave, Roy, and Herbert Coulson. "Craft Guilds and Industry." *A Source Book for Medieval Economic History*, The Bruce Publishing Company, 1936, pp. 234-57.

Epstein, SR. "Craft Guilds, Apprenticeship, and Technological Change in Preindustrial Europe." *The Journal of Economic History*, vol. 58, no. 3, 1998, pp. 684-713.

Lopez, Robert S. *The Commercial Revolution of the Middle Ages, 950-1350*. Cambridge: Cambridge University Press, 2005.

Ogilvie, Sheilagh. *The European Guilds: an Economic Analysis*. Princeton University Press, 2019.

Rosenwein, Barbara. *A Short History of the Middle Ages*. Fourth Edition. University of Toronto Press, 2014.

Improving Access: A Recommendation Encouraging Primary Care Presence in Underserved Communities

**Isabel Gilbertson, Psychology, and
David Yañez, Philosophy**

Faculty Mentor: Erin Vernon, PhD, Economics

**Faculty Content Editor: Vladimir Dashkeev, PhD,
Economics**

Student Editor: Lexi Ziegler, English

Abstract

Primary care (that is, internal medicine, family medicine, or pediatrics) is the cornerstone of healthcare in the United States due to its focus on general care, wellness checkups, immunizations, and other forms of preventative care, yet the number of primary care physicians is expected to drop substantially in the coming years, posing major threats to the country's healthcare system and the health outcomes of Americans. The presence of primary care physicians (PCPs) is associated with positive health outcomes, and higher life expectancy combined with lower medical spending; these are important measures of a country's health and its healthcare system's accessibility, affordability, and effectiveness. Due to a population that is both growing and growing older, as well as healthcare expansions from the coverage Affordable Care Act (ACA), the demand for healthcare in the United States is increasing while the number of PCPs per capita is decreasing. Even worse, Americans in vulnerable and underserved populations are disproportionately affected and may wait months to be seen by a PCP, refill their prescriptions, and receive other necessary services. To highlight the importance of PCPs, this paper recommends as a policy tuition forgiveness for US medical students who become PCPs and work in underserved communities for at least four years. This policy addresses the shortage of PCPs to increase their supply in areas which lack them.

Introduction

The United States is facing a massive primary care shortage. Research demonstrates that where there are a sufficient number of primary care physicians (PCPs) per capita, there are better health outcomes than in areas without sufficient PCPs (Levine 5). PCPs are medical specialists in family medicine, internal medicine, or pediatrics; they serve as a patient's first point of contact to monitor health through annual checkups, address medical concerns, and make referrals to other medical professionals. Adults with a PCP are significantly more likely to fill prescriptions, receive more high-value care, such as cancer screenings, and have a yearly wellness visit (Levine 363). In areas where there are enough PCPs per capita, death rates for cancer, heart disease, stroke, and other illnesses drop, and life spans lengthen (Shi 5). Primary care presence helps achieve better patient health outcomes, decreases healthcare spending, and overall provides better public health for any community (Shi 5).

Inversely, when there is an insufficient ratio of PCPs to patients, health outcomes worsen and healthcare spending increases ("Career Options in Family Medicine"). Without access to a PCP, health issues may go undetected, which can increase medical risk and healthcare spending in the long term. This is demonstrated by the fact that an increase of one PCP per 10,000 people results in a 5% decrease in outpatient visits, 5.5% decrease in inpatient admissions, 10.9% decrease in ER visits, and 7.2% decrease in surgeries, saving millions of dollars in healthcare costs ("Career Options in Family Medicine"). Medically vulnerable populations (like racially minoritized communities) and geographically rural areas face some of the worst health outcomes due to limited access to healthcare (Braveman et al. 189). Individuals from these populations often experience long wait times to see a PCP, refill a prescription, receive a home visit, and obtain other necessary healthcare options. Communities with a high ratio of primary care have robust health outcomes with less long-term spending, lower hospitalization rates, and reports of patient satisfaction regarding their health (Brownlee et al. 2018). Data reveals that for every one PCP added per 10,000 people in a community, general measures of health outcomes increase anywhere from 0.66% to 10.8% (Shi 5). The issue of affordability and access to primary care disproportionately affects low-income and rural individuals. Compared to the universal healthcare coverage that other Organization for Economic Co-operation and Development (OECD) nations supply, the US uses private insurance, making access to affordable healthcare increasingly difficult for many Americans. For instance, one third of US adults claim that their family couldn't afford primary care in the past year, and one in four Americans say care was deferred despite serious medical conditions (Saad). With socioeconomic inequalities growing, more Americans are not consulting a healthcare provider due to cost; therefore, low-income households are more vulnerable to medical issues and more likely to avoid seeing a healthcare provider. Furthermore, the US

currently spends \$8.12 trillion a year—almost 20% of its GDP—on healthcare, yet Americans’ health outcomes and quality of life indexes are not improving (Wessel). To address the issues of affordability and access to PCPs, the US must shift its focus on primary care to improve health outcomes and decrease annual healthcare spending.

To quantify this issue, the US is projected to face a shortage of as many as 49,000 PCPs by 2030 if trends continue (Brownlee et al. 2018). That is, one out of every three Americans will go without recommended primary care, will not fill a prescription, or will not see a doctor when sick because of high medical costs (Gustafsson). To address the discrepancy of supply and demand for PCPs within the US, we examine several causes for the shortage of PCPs in underserved communities—a simultaneously growing and aging population, rising medical school costs, and the Affordable Care Act (ACA) coverage expansion. With these factors in mind, we offer a policy proposal to address PCP shortages in underserved communities: tuition forgiveness for medical students that become PCPs and pledge to serve in underserved communities for at least four years.

Domestic Context

Why is there a shortage of PCPs in the United States? We examine three central causes to contextualize the shortage of PCPs currently and the projected shortage in the future: a simultaneously growing and aging population, rising medical school costs, and ACA coverage expansions. Historically, the demand for PCPs was lower than the demand today due to shorter patient lifespans and a smaller population. Since 1960, however, life expectancy has increased by almost 10 years (ironically due to better medical care and better living conditions), and thus there are significantly more Americans in need of primary care than in the past (Roser 787). Older populations remain in care for more years, meaning that there are far more high-risk patients than before. Furthermore, future trends estimate population growth by more than 10% before 2032, requiring more PCPs to care for a larger and older population (“New Findings Confirm Predictions on Physician Shortage”).

Other causes for the shortage of PCPs begin in medical school. Higher medical education costs have risen substantially throughout the last decade. For instance, the cost of one year at Harvard Medical School was \$38,6000 in 2007-2008, but a year at Harvard Medical School in 2020-2021 cost \$64,984 (“Harvard College and Grad/Professional Tuition”). Of course, the increase in tuition is not exclusive to Harvard Medical School or to medical schools as an institution. This trend can be seen throughout higher education institutions across the country and is expected to continue (National Center for Education Statistics). As medical school tuition rises, so does student loan debt. In 1978, the average medical school debt in the US was \$13,500; in 2016, the average was \$233,100 (Hanson). If the cost of tuition continues

to rise, it is projected that the average medical student will exceed \$300,000 in debt by 2024 (Hanson).

Research from the American Journal of Medicine asserts that medical students often practice specialist, in-hospital work in medical school, rather than outpatient work, and thus are more likely to continue in specialized fields; this indicates that an inherent bias toward specialization exists in the medical school curriculum (Levine 365). Possibly even more significantly, it is more financially viable for some medical students to go into specialized fields such as allergy, dermatology, or cardiology instead of primary care, because specializations are more highly paid (Association of Medical Colleges). To quantify the lifetime cost difference between the salary of a PCP and of a specialist: in 2019, the average pay for a primary care physician was \$213,270, while an anesthesiologist averaged \$261,730—a \$48,460 salary difference (“Physicians and Surgeons: Occupational Outlook Handbook”). For 30 years of work, the total lifetime cost difference between primary care and anesthesiology is \$1,453,800, and this does not take into account possible bonuses, raises, promotions, and other benefits that can increase earnings. The lifetime salary difference between primary care and specialized medical professions can therefore influence a medical student’s choice of field. Many medical students emerging into the workforce with hundreds of thousands of dollars in student debt believe that the most lucrative specialty is the best option for them to pay off their loans. However, the total lifetime cost difference between primary care and specialties is significant even without considering average medical school debt.

The rising cost of medical school together with the increasing amount of debt that medical school students face has been shown to influence their choice of medical specialty (Dezee et al. 191; Pisaniello et al. 11). A study examining the effect of financial remuneration, based on fourth-year US medical students’ choice of specialty, found that finances are a significant factor when choosing a certain medical field (Dezee et al. 191), while 82% of US medical students report that tuition rates and student debt highly influence their area of specialization (Jaret). Of Dezee et al.’s sample, 41% indicated that financial aspects were a prominent factor impacting their decision regarding primary care residency. An additional 41% of the sample would have considered applying to primary care residency had the annual salary been higher (Dezee et al. 191). A systematic review examining the effects of medical student debt on mental health highlight how US medical school students’ loans are associated with their specialty choice (Pisaniello et al. 12). Pisaniello et al. (9) found that each \$50,000 increase in medical loan debt was associated with increased self-reported financial stress and concerns over repaying debt. Furthermore, the presence of significant debt was associated with medical school students choosing higher-paying specialty choices (Pisaniello et al. 12).

Lastly, the Affordable Care Act (ACA) has expanded patient access to healthcare, providing funds and means to see primary care physicians to about 22 million Americans

(Bureau, US Census). A few key features of the ACA include waiving medical fees for annual check-ups; offering wider coverage for a variety of healthcare services; allowing people under 26 to remain on their parents' health insurance plans; better covering Medicaid; and preventing health insurance companies from denying coverage and charging more due to preexisting conditions (Secretary and Assistant Secretary for Public Affairs [ASPA]). Research on healthcare access has found that the ACA has reduced socioeconomic disparities and led to increased access to healthcare for young adults (Griffith et al. 1505; Sommers et al. 168). A study conducted by Griffith et al. examining the ACA's effects on different socioeconomic levels reports that the ACA has significantly helped decrease healthcare access disparities (1506). Griffiths et al. found that in states that expanded Medicaid under the ACA, the gap in insurance coverage between residents in poor households (with incomes less than \$25,000) and higher-income households (incomes more than \$75,000) fell by 46% between 2013 and 2015, while non-expansion states saw the coverage gap fall by 23% (1506). Socioeconomic-related gaps in access to a PCP and cost-avoidant refusal of care both declined as well. Sommers et al. analyzed the ACA's impact on healthcare for the young adult population and found increased gains in insurance and access. People aged 19-25 experienced significant increases in insurance coverage under the ACA (Sommers et al.). Consequently, there is an even greater demand for already scarce PCPs (Medicaid and CHIP Payment and Access Commission). While better coverage is beneficial for health outcomes, the lack of PCPs limits the benefits of ACA coverage.

These historical trends—population increases, rising medical school costs, and ACA coverage expansion—contribute to the shortage of PCPs. As a result, about 25% of Americans report having no PCP access (“About the ACA”); likewise, about 20% of Americans lack any form of health coverage, meaning they have no viable opportunity to see a PCP for a reasonable cost (“About the ACA”).

International Context

Compared to other higher-income nations, the US falls short in healthcare accessibility. In 2019, the US had the lowest life expectancy, highest suicide rates, highest chronic disease burden, highest rate of obesity, highest rates of hospitalization from preventable causes, and the highest rate of avoidable deaths in comparison to Australia, Canada, France, Germany, the Netherlands, New Zealand, Norway, Sweden, Switzerland, and the United Kingdom (Commonwealth Fund). The US has the world's highest healthcare inequity, indicating that Americans face the most disproportional access to healthcare (Papanicolas et al. 1033). Given the absence of universal healthcare coverage, many Americans go without necessary healthcare for reasons of affordability. In the past year, 50% of US adults with low incomes

did not receive necessary medical assistance such as a doctor visit, recommended tests, treatment or follow-up care, or prescription medications (“Home: Commonwealth Fund”). Compare this percent with the 12-15% of adults with low incomes in Germany, the United Kingdom, Norway, and France who reported not receiving care due to cost (Doty). The US leads the world in healthcare spending per capita, including public and private spending, by a considerable margin; in 2018, the US spent about \$5,000 more per person on healthcare than any other OECD country in 2018, nearly as twice as much as the average OECD country (OECD). Despite this fact, its healthcare access and population health outcomes are far worse than those of other OECD countries.

Higher-income nations that have more PCPs and that emphasize primary care employ a tactic called gatekeeping—a cost-effective approach to healthcare spending. In this system, patients must first visit a PCP before they are able to access specialty care (Sripa et al. 294). In a systematic review of gatekeeping in relation to health outcomes and expenditure, it was determined that gatekeeping resulted in fewer hospitalizations, specialty use, and emergency room visits, and therefore led to lower healthcare costs. Patients also made more visits to their PCP, and women participants received significantly more preventative services, such as mammography screenings, clinical breast examinations, and cervical screenings (Sripa et al. 301). Research suggests an association between the gatekeeping system and better healthcare quality and decreased cost compared with a direct-access system. Gatekeeping acts as a cost saving mechanism—that is, if a country has enough PCPs to enact this model.

Due to US emphasis on specialty medical care, Americans are less likely to report access to primary care than people in other higher-income countries, which is concerning from both health and financial outcomes. Overall, specialized medical services are more expensive than primary care since they usually require more attention from medical professionals and invasive medical procedures. PCPs commonly assess whether they themselves can address a patient’s medical needs or if the patient needs to be referred to a specialist. Therefore, specialists who are not generally trained must take up the role of the general practitioner in some cases, causing risk of error. Research demonstrates that people are on balance healthier when they visit a PCP instead of a specialist for care (“As Out-Of-Pocket Health Costs Rise”). That Americans have better access to specialized care than primary care is significant in understanding the effectiveness of the American healthcare system.

Policy Recommendation: Tuition Forgiveness

Based on the benefits of primary care presence in communities, historical trends, and international context, we recommend tuition forgiveness to address the shortage of PCPs today and in the future. We suggest that medical students who become PCPs and work in Health

Professional Shortage Area-designated communities (HPSA, defined as communities with a health practitioner-to-patient ratio of 1:3,500 or more, often rural or low-income communities) for at least four years should have their medical school tuition forgiven (“What is Shortage Designation?”). This solution addresses a significant factor that medical school students face when choosing their medical specialty: student debt. Since student debt plays a significant role for many medical students in deciding their specialty, when the opportunity cost of becoming a PCP rather than a specialist is decreased, more people will choose to become a general practitioner.

Thorough research and implementation supports the idea that tuition forgiveness programs can increase the supply of PCPs in underserved communities. The National Health Service Corps (NHSC), an organization that connects primary healthcare clinicians to people in the United States with limited access to healthcare is the best known of these programs, providing tuition forgiveness in exchange for two years of service in HPSA-designated communities (“NHSC Loan Repayment Program”). The NHSC demonstrates a high rate of retention in its area of service even after its pledge was completed (about 76%) according Pathman et al. this study found that the physician-to-population ratio grew at about twice the rate in areas where NHSC implemented tuition forgiveness programs compared to areas that did not. Moreover, their analysis on a loan subsidy program for students entering service in underserved communities showed that rates of retention in their area of service was 55% higher than students who were encouraged but not bound to serve in underserved communities. Similarly, a meta-analysis of incentive programs by Goodfellow et al. found that students who participated in tuition-incentive programs were about twice as likely as those who did not to serve in underserved communities and to retain positions in those communities.

The NHSC is a strong model for our proposed program, except for the fact that the required time to serve is two years rather than four. This proposal is easily scaled; to begin, legislature could selectively implement tuition forgiveness in areas that are most disproportionately affected by PCP shortages. Progressive application can thus replicate the success of smaller programs, and the program can be expanded where there is need for more widely available incentives. This may also prove to be more effective than large-scale nationwide programs, since it is targeted for underserved areas rather than making a blanket proposal.

Several medical schools have already started offering tuition coverage for students that become PCPs and work in underserved communities. The University of Arizona has adopted a scholarship program that will help address the shortage of PCPs in HPSA communities and has already seen beneficial results. As of 2019, the University of Arizona provides free tuition to medical students who pledge to practice primary care in HPSA designated communities in

Arizona for at least two years post-residency (Office of the Arizona Governors). Additionally, in 2018, New York University's Grossman School of Medicine announced it will award full tuition scholarships to current and future students regardless of merit or financial need ("Cost of Attendance"). The scholarship is not dependent on specialty choice, but can help students consider primary care without the burden of medical school debt influencing their decision. A year after the announcement of full-ride scholarships for students, the Grossman School of Medicine experienced a 47% increase in applications, indicating a strong relationship between financial incentives and preference in job selection (Berman). New York University also plans to open a new medical school on Long Island that provides free tuition and focuses on training PCPs (Communications, NYU). While these programs are new and their outcomes have yet to be studied, their visions are aligned with the proposal of tuition forgiveness for medical students that become PCPs and serve in underserved communities. Moreover, NHSC data demonstrates efficacy in increasing PCP supply that these new trial programs do not yet show.

Tuition forgiveness is not the only viable policy to address PCP shortages. For example, increasing payment incentives for physicians who work in underserved areas has been found to increase their rate of retention by approximately 11% for every \$10,000 added to their salary (Goodfellow et al. 1316). Increasing market incentives can thus be introduced at many stages in a medical student or physician's career, not just in medical school. Therefore, it may be effective to introduce incentives both before and after graduation from medical school to maximize the likelihood that medical students choose to pursue primary care, and that PCPs choose to work in underserved areas.

Conclusion

Healthcare spending will continue to increase in the coming years, yet quality-of-life outcomes and cost effectiveness remain stagnant, with the US spending 50% to 200% more per capita than any other nation ("United States"). In times of normalcy and in times of need, such as the COVID-19 pandemic, PCPs are a necessary component of a healthy population. PCPs are essential because of their unique training to address the most common health issues Americans face, a role specialists cannot effectively fill alone. This policy proposal looks to address one of the most pressing matters that healthcare faces today and is projected to worsen in the future: access. In recommending tuition forgiveness for students who become PCPs and serve in underserved communities for at least four years we hope to address discrepancies in the healthcare market and combat the harshest PCP shortages.

Works Cited

Assistant Secretary for Public Affairs. "About the Affordable Care Act." *HHS.gov*, US Department of Health and Human Services, www.hhs.gov/healthcare/about-the-aca/index.html.

Berchick, Edward R, et al. "Health Insurance Coverage in the United States: 2018." *US Census Bureau*, 8 Nov. 2019. <https://www.census.gov/library/publications/2019/demo/p60-267.html>.

Berman, Jillian. "One Year After Offering Free Tuition, Applications to NYU Medical School Surge." *MarketWatch*, 16 Jan. 2019, www.marketwatch.com/story/one-year-after-offering-free-tuition-applications-to-nyu-medical-school-surge-2019-01-15.

Braveman, Paula A, et al. "Socioeconomic Disparities in Health in the United States: What the Patterns Tell Us." vol. 100, no. S1, *American Journal of Public Health*, 2010, pp. S186-S196. American Public Health Association, <https://doi.org/10.2105/AJPH.2009.166082>.

"Career Options in Family Medicine." *AAFP*, American Academy of Family Physicians, <https://www.aafp.org/students-residents/medical-students/explore-career-in-family-medicine/career-practice-options.html>.

Carter, Matt. "Average Student Loan Debt for Medical School." *Credible*, 27 Mar. 2020, www.credible.com/blog/statistics/average-medical-school-debt/.

Chantrill, Christopher. "US Healthcare Spending." *US Healthcare Spending*, www.usgovernmentspending.com/us_health_care_spending_10.html.

"Cost of Attendance." *NYU Langone Health*, NYU Grossman School of Medicine, med.nyu.edu/education/md-degree/md-affordability-financial-aid/cost-attendance.

DeZee, Kent, et al. "Effect of Financial Remuneration on Specialty Choice of Fourth-Year US Medical Students." *Academic Medicine*, vol. 86, no. 2, 2011, pp. 187-193. *Ovid*, <http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=ovftl&NEWS=N&AN=00001888-201102000-00015>.

Doty, Michelle M, et al. "Income-Related Inequalities in Affordability and Access to Primary Care in Eleven High-Income Countries." *The Commonwealth Fund*, 9 Dec. 2020. www.commonwealthfund.org/publications/surveys/2020/dec/2020-international-survey-income-related-inequalities.

Finn, Deborah A. "The Endocrine System and Alcohol Drinking in Females." *Alcohol Research: Current Reviews*, vol. 40, no. 2, National Institute on Alcohol Abuse and Alcoholism, 23 Jul. 2020, doi: 10.35946/arcr.v40.2.02.

Goodfellow, Amelia, et al. "Predictors of Primary Care Physician Practice Location in Underserved Urban or Rural Areas in the United States: A Systematic Literature Review." *Academic Medicine*, vol. 91, no. 9, 2016, pp. 1313–1321. National Library of Medicine, doi:10.1097/acm.0000000000001203.

Griffith, Kevin, et al. "The Affordable Care Act Reduced Socioeconomic Disparities In Healthcare Access." *National Library of Medicine*, vol. 36, no. 8, Project Hope—The People-to-People Health Foundation, 2017. Health Affairs, pubmed.ncbi.nlm.nih.gov/28747321/.

Gusatafsson, Lovisa. "Controlling Healthcare Costs." *The Commonwealth Fund*, www.commonwealthfund.org/programs/controlling-health-care-costs.

"Harvard College and Grad/Professional Tuition." *Harvard University*, The President and Fellows of Harvard College, oir.harvard.edu/fact-book/tuition.

"Health Spending." *OECD*, <https://data.oecd.org/healthres/health-spending.htm>.

Heiser, Stuart. "New Findings Confirm Predictions on Physician Shortage." *AAMC*, 23 Apr. 2019, <http://www.aamc.org/news-insights/press-releases/new-findings-confirm-predictions-physician-shortage>.

Jaret, Peter. "Attracting the Next Generation of Physicians to Rural Medicine." *AAMC*, 3 Feb. 2020, <https://www.aamc.org/news-insights/attracting-next-generation-physicians-rural-medicine>.

Lazris, Andy, et al. "No More Lip Service; It's Time We Fixed Primary Care (Part Two)." *Health Affairs*, Project HOPE: People-to-People Health Foundation, 21 Nov. 2018, www.healthaffairs.org/doi/10.1377/hblog20181115.163117/full/.

Levine, David M, et al. "Quality and Experience of Outpatient Care in the United States for Adults With or Without Primary Care." *JAMA Internal Medicine*, vol. 179, no. 3, American Medical Association, 2019, pp. 363-372. JAMA Network, doi:10.1001/jamainternmed.2018.6716.

“NHSC Loan Repayment Program.” *HRSA National Health Service Corps*, nhsc.hrsa.gov/loan-repayment/nhsc-loan-repayment-program.html.

“NYU To Open New Medical School on Long Island.” *NYU*, 19 Feb. 2019, www.nyu.edu/about/news-publications/news/2019/february/NYU_Long_Island_Medical_School.html.

Papanicolas, Irene, et al. “Healthcare Spending in the United States and Other High-Income Countries.” *American Medical Association*, vol. 319, no. 10, 2018, pp. 1024-1039. *JAMA Network*, doi:10.1001/jama.2018.1150.

Pathman, Donald E, et al. “National Health Service Corps Staffing and the Growth of the Local Rural Non-NHSC Primary Care Physician Workforce.” *The Journal of Rural Health*, vol. 22, no.4, 2006, pp.285-293. National Library of Medicine, <http://www.ncbi.nlm.nih.gov/pubmed/17010024>.

“Physicians and Surgeons : Occupational Outlook Handbook.” *US Bureau of Labor Statistics*, 1 Sept. 2020, www.bls.gov/ooh/healthcare/physicians-and-surgeons.htm#tab-5.

Pisaniello, Monique Simone, et al. “Effect of Medical Student Debt on Mental Health, Academic Performance and Specialty Choice: a Systematic Review.” *BMJ Open*, vol. 9, no. 7, 2019, doi:10.1136/bmjopen-2019-029980.

Renken, Elena. “As Out-Of-Pocket Health Costs Rise, Insured Adults Are Seeking Less Primary Care.” *NPR*, 3 Feb. 2020, <http://www.npr.org/sections/health-shots/2020/02/03/801351890/as-out-of-pocket-health-costs-rise-insured-adults-are-seeking-less-primary-care>.

Rohlfing, James, et al. “Medical student debt and major life choices other than specialty.” *Medical Education Online*, vol. 19, 11 Nov. 2014, Taylor & Francis Online, doi:10.2402/meo.v19.25603.

Tikkanen, Roosa and Melinda K. Abrams. “US Health Care from a Global Perspective, 2019: Higher Spending, Worse Outcomes?” *Commonwealth Fund*, 30 Jan. 2020, <https://www.commonwealthfund.org/publications/issue-briefs/2020/jan/us-health-care-global-perspective-2019>.

Saad, Lydia. “More Americans Delaying Medical Treatment Due to Cost.” *Gallup*, 9 Dec. 2019, news.gallup.com/poll/269138/americans-delaying-medical-treatment-due-cost.aspx.

Scheckel, Caleb J, et al. "Role of Debt and Loan Forgiveness/Repayment Programs in Osteopathic Medical Graduates' Plans to Enter Primary Care." *The Journal of the American Osteopathic Association*, vol. 119, no. 4, Apr. 2019, pp. 227. doi:10.7556/jaoa.2019.038.

Shi, Leiyu. "The Impact of Primary Care: A Focused Review." *Scientifica*, vol. 2012, Hindawi, 31 Dec. 2012, pp. 1–22. doi:10.6064/2012/432892.

Sommers, Benjamin D, et al. "The Affordable Care Act Has Led To Significant Gains In Health Insurance And Access To Care For Young Adults." *Health Affairs*, vol. 32, no. 1, 1 Jan. 2013. www.healthaffairs.org/doi/abs/10.1377/hlthaff.2012.0552.

Sripa, Poompong, et al. "Impact of GP Gatekeeping on Quality of Care, and Health Outcomes, Use, and Expenditure: a Systematic Review." *The British Journal of General Practice*, vol. 69, no. 682, US National Library of Medicine, 25 Mar. 2019. pubmed.ncbi.nlm.nih.gov/30910875/.

Steinwald, Bruce, et al. "We Need More Primary Care Physicians: Here's Why and How." *Brookings*, 8 Jul. 2019, www.brookings.edu/blog/usc-brookings-schaeffer-on-health-policy/2019/07/08/we-need-more-primary-care-physicians-heres-why-and-how/.

"The Complex Relationship between Cost and Quality in US Healthcare." *Virtual Mentor*, vol. 16, no. 2, 2014, pp. 124–130, doi:10.1001/virtualmentor.2014.16.02.pfor1-1402.

"Tuition Costs of Colleges and Universities." *National Center for Education Statistics (NCES)*, nces.ed.gov/fastfacts/display.asp?id=76.

"U Arizona Colleges Of Medicine To Provide Free Tuition For Primary Care Medical Students." *Office of the Governor Doug Ducey*, 22 Nov. 2019, https://azgovernor.gov/governor/news/2019/11/uarizona-colleges-medicine-provide-free-tuition-primary-care-medical-students.

Wessel, David. "How Worried Should You Be about the Federal Deficit and Debt?" *Brookings*, 1 Oct. 2020, http://www.brookings.edu/policy2020/votervital/how-worried-should-you-be-about-the-federal-deficit-and-debt.

"What Is Shortage Designation?" *Health Resources & Services Administration*, Bureau of Health Workforce, bhwh.hrsa.gov/workforce-shortage-areas/shortage-designation.



Short Communications

This section consists of preliminary data, initial findings, and other brief investigations into any field of inquiry. While some contributions here come from the humanities, as an interdisciplinary journal, we wanted to be mindful of the ways in which science and empirically-based social science writing can differ from humanities and qualitative social science writing. Because publications in the sciences are often multi-authored, in which case student researchers might not be the first authors, we wanted to create a space where our science students' research could still be showcased. Science journals in many disciplines have a section like ours (called variously "short communications," "conversations," or "letters") where authors can publish independent work, or roll out individual findings within larger research projects as they emerge. We have developed Short Communications on this model to serve our students in the various science and social science disciplines.

The Role of Nature in Japanese American Internment Narratives: Julie Otsuka's *When the Emperor Was Divine*

Brandon McWilliams, English and Environmental Studies

Faculty Mentor: Nalini Iyer, PhD, English

Faculty Content Editor: June Johnson Bube, PhD, English

Student Editor: Alia Fukumoto, English

Abstract

The relocation and internment of US residents of Japanese heritage during World War II has been well documented, both historically and in literature. The critical examination of internment narratives has, however, largely failed to consider the highly consequential role of the natural environment in the internment experience and subsequent internment literature. In this paper, I examine Julie Otsuka's *When the Emperor was Divine*, in conjunction with historical sources, through an ecocritical and environmental justice lens. In doing so, I reveal that the natural environment played a dual, and often contradictory, role in the internment experience. On the one hand, nature was as a source of hardship for interned people, as the harsh, alien environments of the camps were a source of physical and emotional pain, and thus acted as one of many tools of oppression. On the other hand, nature offered spaces of defiance and sanctuary, and thus provided a means to actualize and process the traumatic experience of internment. Through this analysis, I not only highlight the importance of the natural world in Otsuka's text, but also stress the importance of further ecocritical examinations of internment narratives.

Introduction

On February 19, 1942, President Franklin Delano Roosevelt signed Executive Order 9066. The purpose of the act was to prevent espionage in the face of national panic following the bombing of Pearl Harbor. This act disrupted the lives of over a hundred thousand people of Japanese ancestry living on the West Coast. Ten internment camps were quickly constructed, and those of Japanese ancestry were forcibly removed to those sites where they were imprisoned until 1945. This experience—the internment experience as I will refer to it—was a deeply traumatic event for all involved, but also generated a substantial body of literature, including firsthand accounts like *Desert Exile: The Uprooting of a Japanese American Family* by Yoshiko Uchida, and *I Call to Remembrance* by poet Toyō Suyemoto.

In popular and critical analysis, these works are often read for themes of alienation, a search for identity, generational difference, and national betrayal. While these readings account for integral parts of the internment experience, they often leave out an important facet of the genre: the role of the environment. An understanding of the environmental effects on literature surrounding the internment experience is vital for a full understanding, but is certainly under-examined. Despite the lack of critical attention, the role of nature shines through internment literature and stories, both in a positive and negative capacity. Julie Otsuka's novel *When the Emperor was Divine* provides an important case study of this trend. On its surface, the text revolves around the personal and interpersonal trials of a Japanese family from Berkeley, California as they are forced to relocate to the Topaz camp in the Utah desert. Under the surface of her novel, she unpacks the deep effect nature has on the characters' internment experience as it is shaped by their relationship to the natural world. Namely, Otsuka reveals the complex role nature played for internees, both as a source of hardship and heightened alienation, as well as a balm by which they actualized their experience by building subversive spaces of sanctuary.

In this essay, I will examine *When the Emperor was Divine* along with historical accounts and related scholarship through an ecocritical lens. This paper will be split into two parts: first, an investigation of nature as a source of hardship, in which I will examine its role as a tool of oppression and source of physical and emotional pain; second, as a study of nature as a boon, in which I will look at nature's role in assisting to process the traumatic experience of internment, as well as its ability to provide spaces of defiance, sanctuary, and home.

Alienation of Landscape and Loss of Home

Those who study the Japanese internment will almost certainly be familiar with the names and locations of various camps such as Topaz, Manzanar, and Tule Lake. These camps

became iconic for their gaunt rows of tarpaper houses surrounded by barbed wire fences. This imagery represented the violation of thousands of people's rights and dignities; yet the camp structures were by no means the only source of hardship for those within their walls. The very locations of the camps were carefully calculated to benefit the federal government, and increase the isolation and alienation felt by those imprisoned. Otsuka describes the journey her characters take from their home in the San Francisco Bay Area to the Topaz camp as if it were a bad dream: "[t]he girl had always lived in California—first in Berkeley, in a white stucco house on a wide street not far from the sea [...] but now she was going to Utah to live in the desert" (Otsuka 25). The girl's first real glimpse of this new, alien place is just beyond the last outpost of civilization. On her way to the camp, she passes by hedges and domestic tranquility that lie incongruously before the reality into which she, and the rest of the train full of Japanese Americans, are headed. This reality is powerfully rendered by Otsuka's description of the camp as "nothing but the scorched white earth of the desert stretching all the way to the edge of the horizon" (23). The girl's perception of her new desert home as a blasted wasteland was shared by many who arrived at the Topaz camp.

The lived experience of the girl is corroborated in Yoshiko Uchida's memoir *Desert Exile: The Uprooting of a Japanese American Family*. In her memoir, she describes Topaz as "bleak as a bleached bone" (Uchida 130). "Everywhere I looked," says Uchida, "there was only the hard white glare of bleached sand and no sign of the renewal of life so abundant in California" (140). This bleak, uprooted sentiment is echoed in another first-hand internment memoir by poet Toyo Suyemoto. In her narrative *I Call to Remembrance*, Suyemoto mentions the stark difference between the desert of Topaz compared to her home in California: "[s]truck by the barrenness of the place, we spoke wishfully about California; we experienced natsukashi-mi, the Japanese term for this emotional state of yearning, of longing" (Suyemoto 79). The concept of natsukashi-mi captures the first, and in some ways most profound emotional blow with which the internees were hit. The entire experience of internment was a series of alienations: from country, community, and identity as an American. When Otsuka's unnamed boy and girl step off the final bus into the desert, they realize like so many other Japanese Americans that their final loss is that of home. Any pretense of familiarity that might have persisted in the intermediary Tanforan Assembly Center, or their long train ride to Utah were wiped away by "the blinding white glare of the desert" (Otsuka 48).

The sense of longing and loss for those places where the internees had space, privacy, acceptance, and belonging is ingrained into virtually all internment narratives. The boy in Otsuka's novel feels the pull of home from all manner of sources. He feels it when he remembers his friend Elizabeth, the only one who writes him letters in the camp, and in the loss of the familiar schedule when dinner started precisely at 6:00 pm. He also remembers the feeling his home environment evoked through the nature which defined it: "in his mind he

could see it: the tree lined streets at sundown, the dark green lawns” (Otsuka 66). Otsuka’s description of the boy’s neighborhood makes it clear that many internees felt that home was where trees shade the streets, where their gardens grew exactly as they were planted, and where the cool ocean breeze washed over them at night. To live amidst the unrelenting sunlight and pitiless barren earth of the Utah badlands was just another reminder of all they had lost and what many feared they would never regain.

Wasteland and Waste People

Psychological alienation produced one level of trauma; physical isolation produced an entirely different layer of violation. The requirements set by the United States government for the camp’s location virtually guaranteed that they would be placed in harsh, inhospitable locations. The decision made by the War Relocation Authority stated that camps must be situated on tracts of undeveloped land large enough to house thousands of people, so as to minimize the ratio of guards needed. As a result, the camps were placed on federal land so that no private individual would benefit from the improvement labor required of internees; consequently, they had to be set in a location where their work would be useful in turning wasteland into productive land (Chiang 240-241). These criteria directly applied to the federal government’s stance towards its Japanese population.

In the government’s view, people of Japanese heritage on the West Coast had to be moved, but not into a location where they would disturb any of the ‘upstanding’ (e.g., white) citizens whose loyalty was not questioned. Instead, they ought to “assist in the war effort to prove, by constructive deeds, that they are loyal Americans” (United States WRA 76). Thus, those who the government chose to treat as suspect were placed on land that had no commercial use. A report by the Commission on Wartime Relocation and Internment of Civilians states “[t]hat these areas were still vacant land in 1942, land that the ever-voracious pioneers and developers had either passed by or abandoned, speaks volumes about their attractiveness” (156-157). The insult of being forced into these unwanted spaces was compounded once again by the clear double standard being applied to white versus Japanese Americans.

Otsuka masterfully highlights this outrageous hypocrisy in this passage: “[t]hey passed block after block of white houses with wooden porches and neatly manicured lawns [...] For several miles they passed nothing but farms and alfalfa fields and the scenery was very pleasant, then the bus turned onto a newly tarred road and drove in a straight line past the occasional clump of greasewood and sage until it arrived at Topaz” (47-48). Otsuka once again encapsulates the feeling of being absolutely unwanted, of being shunted to the edge of one’s own society. After all the family has been through in Tanforan and on the train, they must

suffer one last insult before arriving at the camp. In driving through a quintessential American town (e.g., white picket fences and bucolic charm), they are reminded once more that they are barred from that space which is so central to American identity. They are not even welcome in the farmland, where the land and its produce are still valued. Instead, they must drive through these places into wasteland where nothing is built or grown, and thereby has little value to the United States other than as a prison. As Otsuka puts us in the perspective of those on the bus, what does that say about their identity?

Physical Harshness

The emotional toll the camps exacted was intense, but the physical harshness of the land was equally if not more trying for imprisoned Japanese Americans. Dust, heat, and bitter cold were the defining characteristics of Topaz. Of these, dust was the first to greet the travel-weary internees when they stepped off the buses and into the camp. In almost every piece of writing about Topaz, the dust is prominently featured. In their first-hand memoirs, Uchida and Suyemoto describe their entrance into the camp in almost word-perfect synchronicity. Uchida remembers that “[w]ith each step we sank two to three inches deep, sending up swirls of dust that crept into our eyes and mouths, noses and lungs” (132). In Suyemoto’s memoir she recounts, “[h]ere was unspeakable dreariness and gray, stifling dust everywhere [...] We stepped down from the bus and sank ankle-deep into the powder silt” (75). Otsuka also expresses the reality of the dust as she describes “everything she saw through a cloud of fine white dust that had once been the bed of an ancient salt lake. The boy began to cough” (Otsuka 48).

The depth of dust was not a natural occurrence; rather, it was the result of the camp’s hasty construction. When all vegetation holding down the soil was cleared away for construction, it stirred up the fine silty soil that created the suffocating dust. In a tragically ironic twist, the very existence of the dry lakebed was a result of colonial meddling. Before settlers arrived, the area was known by the native Paiute people as “‘Pahvant’ meaning ‘abundance of water’” (Arrington 23). Diversion of the Sevier River which fed the area began in 1859. This continued until the area became the desert which Otsuka’s characters experienced (Heymond). Regardless of its creation or cause, the dust represented the first worrying sign that this place was not fit for life. The dust clogged noses, irritated eyes, and choked lungs. The implication of the internees’ dusty entrance is plain to see; if the first steps into the camp cause this much discomfort and pain, Otsuka implies, the rest of the experience can only bring more hardship.

The internees’ sense of foreboding was certainly warranted. The heat of the camp in the summer was staggering. As Otsuka recounts, “[t]he air above the barracks shimmered. It

was ninety-five degrees out. One hundred. One hundred and ten" (53). For those used to the temperate Mediterranean climate of the San Francisco Bay, such temperatures were unknown, absurd. Just as troubling was the cold, for at night "[t]he temperature dropped to ten degrees. Five. More than once, to twenty below" (Otsuka 87). Once again, memoirs confirm these harsh conditions: "the days grew sharp and brittle with cold. Morning temperatures hovered close to zero" (Uchida 153). Ultimately, the extreme climate, the dust, and the harshness of the Topaz environment culminated to symbolize one central idea; that Topaz was a place where nothing could flourish. Plants, animals, and people alike all struggled and died under the desert's weight. Tellingly, the plants and trees brought in by the camp administration to bring life to the bleak environment expired wholesale: "75 large trees and 7,500 small trees, principally Siberian Elms, Utah Junipers, Russian olives, and black locusts, were obtained to beautify the center. There were also 10,000 cuttings of tamarisk shrubs, willows, and black currants. Nearly all the trees and shrubbery died; the alkali soil, heat, and wind foiled efforts to get grass and flowers to grow" (Arrington 21).

The boy in Otsuka's novel seems to take this pervasive sense of death to heart. Frequently, he blames himself for the deaths of beings he had no control over, including the tortoise he found in the camp: "[i]ts head and legs were tucked up inside its shell and it was not moving. Had not moved for several days. Was dead. My fault, the boy thought" (Otsuka 82). Despite the boy's concern for the lives around him, he cannot process all the death which surrounded the internees: "[s]mall birds lost their way and dropped out of the sky [...] A man disappeared and was found frozen to death three days later" (Otsuka 88). While some endings are given importance by the boy as he attaches his own actions to them, others are narrated neutrally, as if they were just another piece of the Topaz landscape. Loss, it is implied through this persistent notation of death, is the very essence of the camp. In Otsuka's novel, as in other internment narratives, the camps take much and give back little.

Land as Catharsis

While the landscape and placement of the camps took a heavy toll on the internees, nature was nevertheless a positive force as well; for example, in the Topaz camp even amidst the harsh desert environment, small moments of non-human life and beauty became sources of solace and hope. Many of these signs were subtle, as life in the desert often is. When the children in Otsuka's novel walk along the camp fence, they point out small things of interest and wonder, such as "[a] dog chasing a porcupine, a tiny pink seashell, the husk of a beetle, a column of fire ants marching across the sand" (Otsuka 65). In the grand scheme of things, each of these moments are tiny and would have likely been ignored in the course of their pre-internment life; however, in the context of camp life, they take on an outsized sense of

importance in the children's eyes. Despite the insignificance of each, they offer the children a chance to break from the unhappiness and discomfort brought about by the confines of the camp, and instead focus on something outside of their experience. In a time and context where racial, cultural, and political appearances and opinions dictated the direction of their lives, the neutrality of the natural world offers a respite from the weight of prejudice. A seashell, Otsuka insinuates, cannot hate and the ants have no opinion; they are simply unique and fascinating. This search for pleasure and escape is a common theme in internment memoirs as well. Uchida, for example, fondly remembers the peace and calm of evening walks: "[w]e often took walks along the edge of camp, watching sunsets made spectacular by the dusty haze and waiting for the moon to rise in the darkening sky" (Uchida 132). It is striking that even while imprisoned, Uchida and many others still managed to appreciate the beauty of their surroundings. Whether this attention on the non-human was a form of distraction or simply a reframing of their experience, the result seems to be the same. The first gift nature gave back to the internees was the gift of distraction and joy, no matter how fleeting.

Meaning and Solace Through Gardening

Another boon the Japanese internees extracted from their natural surroundings was a sense of purpose brought about by cultivating their bleak surroundings. In almost all ten camps, gardens and farms sprang up, ranging from a single bulb in a coffee can to extensive agricultural operations. These cultivated spaces served three beneficial purposes for the internees: first, they provided meaning in the stagnant and largely isolated world of the camps; second, gardening was a subtle and acceptable way to subvert their treatment as worthless; finally, they proved that life could flourish in the camps despite harsh conditions. Estelle Ishigo's first-hand memoir *Lone Heart Mountain*, detailing her experience at the Heart Mountain Relocation Center sums up the essential joy of gardening for internees through the experience of her grandmother: "[s]he wanted to nurse little growing things [...] Just once again to see the beauty of young, living plants" (19). Otsuka's boy, too, experiences the joy and companionship brought about by cultivating a plant. In this case, he takes solace in the bloom of his bulb, Gloria, after he thought it had died: "[i]nside the rusted peach tin, a sudden burst of yellow. The boy touched the petals with his finger again and again" (100). The life of one flower or the flourishing of one tree might seem inadequate to counteract the injustices of the camps. Nevertheless, as landscape architect Kenneth Helphand's book *Defiant Gardens* highlights, "[f]or people who had just been dispossessed of their homes, belongings, careers, and daily lives, this [gardening] was particularly important. The tangible physical result was a form of communication—we did this, and this is who we are" (190).

Emotional Catharsis through Nature

The hardest to define, yet most emotionally vital role nature played in the internees' lives was as a medium for authentically processing their experience. Internment was perhaps the most emotionally fraught and distressing period in the internee's lives, and the desire to express their accompanying emotions was understandably strong; however, there were ample reasons to be cautious of expressing raw and authentic emotions while in the camps. The desire of the American government to portray internment experience as an essentially benign, possibly even positive, was clear. Parroting the government PR line about the benefits of the camps, the *Los Angeles Times* in 1942 stated that those sent to the Manzanar War Relocation Center in the arid Owen's Valley, "couldn't wish for better scenery or a cleaner, more healthful atmosphere" (Cameron Ai). The Office of War Information went one step further by producing a short propaganda film calling internment a "mass migration" (1:17) enacted with "real consideration for the people involved" (1:32) to locations that were "untamed, but full of opportunity" (6:30). The perceived loyalty of the internees was under constant scrutiny due to the hanging threat of longer imprisonment, loss of employment, separation from family, or relocation to Tule Lake High Security Segregation Center—where those deemed most dangerous or disloyal were sent (Takei and Tachibana). Given the power the government obviously held over internees to dictate their lives and the lives of their families, it seemed only prudent to most internees to not speak the full extent of their experience. Instead, many turned to the natural world around them. Through images like that of the open sky, sunset, flora, and fauna, and other pieces of landscape they had been forced into, internees found ways to artistically express their experience without the threat inherent in more open mediums of expression or protest. A poem titled "Clouds" by Ben Mura found in Charlotte B. DeForest's collection of poems *Cactus Blossoms 1945, Poems by Students of Butte High School, Gila Relocation Center, Rivers, Arizona*, showcases this veiled expression of internee experience:

I stand and watch the clouds sail by
Across the land of sage and sand.
Up near the roof of spacious sky
The clouds float over mesas grand.

I breathe a sigh that it were I
That drift beyond the western steep,
Where poppies bloom with blossoms high,
Where sea gulls play with waves so deep.

I wish I were a cloud now floating by,
Where cacti stand and shadows lie. (Chiang 1)

Mura discusses the desire to escape, to be anywhere but the stifling confines of the camp. This was a common sentiment in much of the art produced in and around the internment experience. Another common emotion was the loneliness and pain of separation from family, friends, and community. The boy in Otsuka's novel draws a less direct, but no less poignant, parallel as he thinks of his father. As he wonders where his father is and what he is doing, he notices "a lone coyote in the hills to the south, howling up at the moon" (Otsuka 67). No matter the emotion expressed, the desire is the same. Everyone, on some level, wants to feel heard and validated. When the US government removed the reasonable possibility for the internees' direct expression of their experience, lest they be deemed disloyal or dangerous, they were forced to turn to the natural world for validation. In the harsh, alien environments into which they were thrust, the residents of the camp found one of their greatest outlets to creatively express their joy, pain, anger, confusion, and sadness. When the boy hears the coyote howl its lonely cry to the moon, he howls along and is left a little less alone.

Conclusion

When Executive Order 9066 was signed, it marked a expression of profound American xenophobia that set into motion years of trauma, indignity, and loss for thousands of people of Japanese heritage. It is no surprise, then, that the vast majority of literary discourse surrounding internment stories has centered on more anthropocentric themes of racism, alienation, and identity. These readings are by no means untrue. Rather, they simply fail to incorporate an additional, vital component of the experience that is nature. Nothing exists in a vacuum: Japanese internment was planned, executed, and sustained within the sphere of the natural world; thus, it is incomplete to examine the internment experience without fully considering the role nature played. I have highlighted a number of ways in which the natural world acted both as a boon and source of pain to Japanese Americans. The imprint of the natural world inevitably entwines itself into these narratives, as has been shown through the examination of *When the Emperor was Divine*.

While I chose to focus this essay through Otsuka's moving text, the ecocritical lens is by no means tied to that specific text. I would encourage others to take this critical lens and apply it elsewhere so that a deeper, more nuanced understanding of the relationship between the environment and internment may emerge. Ultimately, by revealing this understudied facet of

internment, I hope that scholars and the public alike can come to understand how internment changed, and continues to change, the art, stories, experiences, and lives of those affected down the generations.

Works Cited

Arrington, Leonard J. *Price of Prejudice: the Japanese-American Relocation Center in Utah during World War II*. Topaz Museum, 1997.

Cameron, Tom. "Japanese Get 'Break' in Owens Valley Move," *Los Angeles Times*, March 30, 1942, p. Ai.

Chiang, Connie Y. "Imprisoned Nature: Toward an Environmental History of the World War II Japanese American Incarceration." *Environmental History*, vol. 15, no. 2, 2010, pp. 236-267. JSTOR, www.jstor.org/stable/20749671.

Commission on Wartime Relocation and Internment of Civilians. *Personal Justice Denied*. University of Washington Press, 1997, pp. 156-157. *National Archives*, <https://www.archives.gov/research/japanese-americans/justice-denied>.

Haymond, Jay M. "Sevier River." *Utah History Encyclopedia*, edited by Allen Kent Powell, University of Utah Press, 1994. www.uen.org/utah_history_encyclopedia/s/SEVIER_RIVER.shtml.

Helphand, Kenneth I. *Defiant Gardens: Making Gardens in Wartime*. Trinity UP, 2006.

Ishigo, Estelle. *Lone Heart Mountain*. Heart Mountain High School Class of 1947, 1989.

Krug, J.A., and D.S. Myer. *WRA: A Story of Human Conservation*. United States Department of Interior, War Relocation Authority, 1946. *Hathi Trust Digital Library*, <https://catalog.hathitrust.org/Record/000807368>.

Office of War Information Bureau of Motion Pictures. "1943 U.S. Government Produced Film 'Japanese Relocation' Addresses Relocation Camps." *YouTube*, uploaded by The Oregonian, 16 Feb. 2017, www.youtube.com/watch?v=yVyIa11ZtAE&ab_channel=TheOregonian.

Otsuka, Julie. *When the Emperor was Divine*. Anchor Publishing, 2003.

Suyemoto, Toyo. *I Call to Remembrance: Toyo Suyemoto's Years of Internment*, edited by

Susan B. Richardson, Rutgers University Press, 2007.

<https://ebookcentral.proquest.com/lib/seattleu/detail.action?docID=332706>.

Takei, Barbara and Judy M. Tachibana. *Tule Lake Revisited: a Brief History and Guide to the Tule Lake Concentration Camp Site*. Second ed., Tule Lake Committee, Inc., 2012.

Uchida, Yoshiko. *Desert Exile: The Uprooting of a Japanese American Family*. University of Washington Press, 2015.

<https://ebookcentral.proquest.com/lib/seattleu/detail.action?docID=4305983>.

Trees Take the Streets: Urban Tree Growth and Hazard Potential

Amelia Serafin and Brooke Wynalda, Biology

Faculty Mentor: Mark Jordan, PhD, Biology

Faculty Content Editor: Michael Zanis, PhD, Biology

Student Editor: Lucas Neumeyer, Film Studies

Abstract

Urban forestry is the science and technology of managing trees and forest resources in and around urban community ecosystems for the physiological, sociological, economic, and aesthetic benefits trees provide society. As urbanization rapidly increases, so does urban forestry. Although increasing the number of trees in urban environments can be beneficial to human residents, trees in urban environments can also become hazardous if improperly trimmed, located, and cared for. For example, human-induced pruning via side trimming compromises tree branch structural integrity. This study investigates whether the phenomenon of side pruning can be brought about naturally by specific combinations of tree aspect relative to the tree's nearest building and nearest building height. Measuring trees in a predominantly commercial neighborhood in the Northern hemisphere, we found that trees on the south side of buildings (those which receive the most sunlight) have a greater proportion of branch diameter comprised of far branches and naturally mimic a possibly dangerous side-pruned shape. Nearest building height did not impact branch growth patterns. Therefore, trees planted on the south side of buildings have a higher potential to become hazardous, due to naturally induced asymmetrical branch growth, and thus should be monitored more closely for hazard potential.

Introduction

The world is urbanizing faster than ever before. It is projected that the amount of land converted to urban environments will double between 2010 and 2060 in the United States alone (Nowak 2018). As urbanization rapidly increases, urban forestry also continues to rise, making the relationship between industry, humans, and urban trees closer than ever. Moreover, humans benefit greatly from urban forestry, especially in terms of both physical and mental health (Ulmer et al. 2016). Studies to further the understanding of how urbanization affects trees are vital to adequate tree growth and survival, as well as to optimum human health and well-being. However, the rise in urban forestry can also pose serious threats to humans and urban structures in the form of hazardous trees (Pokorny 1992). For the purposes of this essay, a hazardous tree is defined as a tree whose lack of structural integrity poses risk to people and property. Hazardous trees can occur under various circumstances; for example, improper pruning of trees can lead to structurally unsound branch formations (Pokorny 1992). Trees that have been pruned in a side-trimmed formation particularly lack structural integrity (Figure 1) (Bartlett Tree Experts 2016). This stems from the fact that uneven branch distribution around the tree central axis, or the trunk, leads to uneven weight distribution. This creates stress and can cause potential trunk or branch breakage.

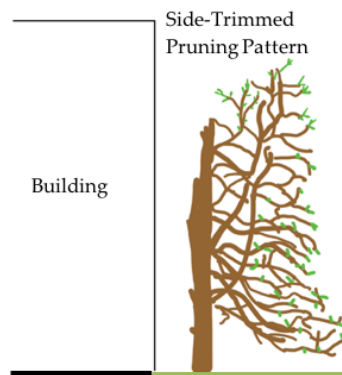


Figure 1 A schematic depicting the phenomenon of pruning a tree to be side-trimmed. Side-trimmed trees are more susceptible to decreased structural integrity leading to them being potentially hazardous.

Studies show that increasing urbanization poses challenges to tree growth and health. These studies have found that polluted soil, poor soil quality, heat stress, and numerous impervious surfaces are all urban factors that negatively affect trees (Jim 1998, Mullaney 2015). Studies also show that trees will change their whole body-shape in response to sunlight availability (Loehle 1986). Trees exhibit phototropism, a plant's affinity to grow towards sunlight. Less shade-tolerant trees exhibit higher levels of positive phototropism (Loehle 1986). Additionally, some trees in lower light conditions put more energy into branch growth than those with access to more light (King 1997). While it is known that trees will grow towards sunlight when they become shaded, few studies have analyzed the variation that urban pressures pose on tree branch growth. More explicitly, there has been little research analyzing the

impact of tall buildings on sun availability for trees.

Planting trees that are properly suited for their surrounding urban environments is of increasing importance. Therefore, we hypothesize that this side-trimmed formation can occur not only as a result of intentional, improper pruning but also as a result of trees placed in incompatible urban environments that cause them to naturally grow into the side-trimmed shape. Ultimately, this research seeks to maximize the benefits of urban forestry by laying the groundwork for which environmental conditions may help avoid potential safety hazards that incompatible trees pose to urban residents.

In our preliminary observations, we found that trees located next to buildings in commercial neighborhoods had a lower percentage of their branches facing the nearest buildings than those in residential neighborhoods. These observations and results led researchers to test which building characteristics and tree placements are best suited for non-hazardous growth. Our study sought to a) determine the relationship between tree aspect (the compass direction a slope faces) relative to the building and the percentage of branch diameter comprised of far branches, and b) determine the relationship between the nearest building height and the percentage of branch diameter comprised of branches furthest from the trunk.

We hypothesized that a) trees to the north and east of their closest buildings will have a higher percentage of far branches that make up their diameters than trees to the west and south. We predicted that in urban environments, buildings behave similarly to hills. In the Northern hemisphere, trees with south and west aspects receive the most solar radiation during their growing season. Thus, a tree on the north side of a building is the equivalent of a tree on the north side of a slope and is therefore in shade for most of the day. If it is on the east side, the tree receives morning sun but is in the shade in the afternoon and evening. Therefore, our prediction stated that trees located north and east of buildings direct energy from their limited sunlight to grow longer branches away from the building in search of more sunlight, creating a natural side-trimmed shape (Loehle 1986).

We also hypothesized that b) trees near taller buildings will have a higher percentage of far branches that make up their diameter than trees near shorter buildings. This is because trees near taller buildings will be in the shade of the building for longer parts of the day and thus grow outwards away from the building seeking sunlight.

Methods

Study Area

Our study area was 52 blocks in Capitol Hill, a predominantly commercial urban neighborhood in Seattle, Washington (Figure 2). Seattle is a densely populated urban environment that has experienced rapid growth within the last decade (US Census Bureau 2019). Paralleling this increase in growth has been an increase in sustainability and urban forestry within this green city. The effects of compatible tree placement are tremendously pertinent to this area type. The Capitol Hill area is one of the longest-standing urban areas of the Seattle city center; therefore, if urban forestry patterns are present they will likely be exhibited in this neighborhood.

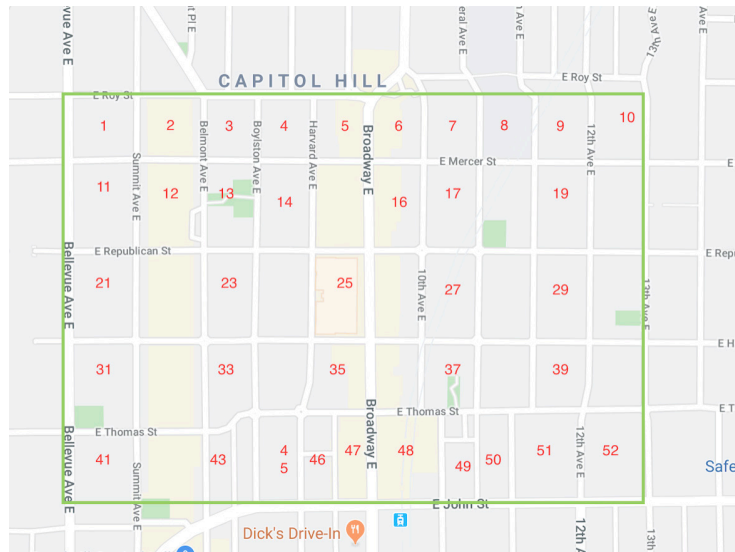


Figure 2 Our study area consisted of 52 blocks in the predominantly commercial urban neighborhood of Capitol Hill in Seattle, Washington. Capitol Hill is one of the oldest neighborhoods in Seattle with some of the oldest trees, and any tree growth patterns connected to urban development are likely to be exhibited there.

Field Methods

We collected data for our observational study in November, 2019 across multiple sampling days. We collected data each sampling session between the hours of 1:30 pm and 5:30 pm. We sampled 89 trees using random non-replacement sampling, having at least 20 trees sampled for each cardinal aspect direction. More specifically, we selected the cardinal direction, or the side of the block sampled, and used a random number generator to select which of the 52 blocks we would measure for that cardinal direction. If the same side of a particular block was selected twice, we would select again so as to not sample the same side of the same block twice. Sites like alleyways or garage ports which did not have any trees were considered unfit for sampling and were discarded. Then, when sampling trees on the selected block side, we used a random number generator to determine if we were sampling every other even or odd tree. Occasionally a tree would grow on private property or be over 5 m from the nearest building and thus could not be sampled. We included this tree when counting the trees on the block to maintain the randomness of the study, however we did not include this data for analysis. Moreover, if all the trees on the block were over 5 m from a building or grew on private property, a new block was randomly chosen to be sampled using the same process outlined above.

In order to measure the tree-to-buildings aspect, defined as the cardinal degree of the tree while facing its nearest building, we stood next to the trunk directly facing the closest building. Then, using a compass, we measured the aspect in degrees. We divided aspect into four quadrants: north buildings relative to the tree falling between 316° and 45° , east buildings relative to the tree falling between 46° and 135° , south buildings relative to the tree falling between 136° and 225° and west buildings relative to the tree falling between 226° and 316° . In order to measure building height, we counted the number

of stories in the building. In order to measure whether a branch was near or far, we measured from the center of the trunk; near branches started on the half of the trunk closer to the building and far branches started on the half of the trunk closer to the street. In order to measure the radius of the near or far branches, we used a tape measure starting at the center of the trunk and measured outward, in meters, to the farthest tip of a branch. In some cases, an overhang or balcony protruded out of the building and ended between the building wall and the tree trunk. In these cases, we measured to the longest near branch despite it possibly being obstructed from view by the overhang.

In this study, we have controlled for season and neighborhood by sampling predominantly commercial trees during the same month of fall. Although we did not control for tree species, our large sample size should have negated this possible confounding variable. A potential limitation to our methods was our inability to access potential data related to construction in the vicinity of our samples. Possible construction could have impacted branch growth patterns.

Data Analysis

We conducted an ANOVA to compare the mean percentage of the branch diameter composed of far branches. We also conducted a linear regression to determine the relationship between the number of stories in the nearest building and the percentage of the branch diameter composed of far branches (R Core Team 2019).

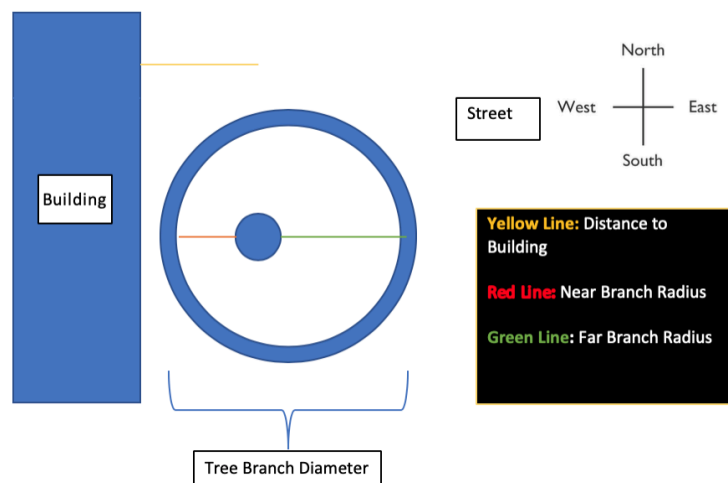


Figure 3 This figure is a visual presentation of the common definitions used throughout this report.

Results

We measured 89 trees covering all four tree aspect directions relative to their closest building: north, east, south, and west. The tree's aspect relative to the building has a significant effect on the percentage of far branches comprising the tree's diameter (Figure 4). However, there is only a significant difference in the mean far branch percentage between trees with south and north aspects relative to their buildings. Mean, denoted by μ , describes an average, in this case the average percentage of branches that comprise the trees' diameters on north blocks versus south blocks. P-value, denoted as $P=$, describes the likelihood an observation occurred by random chance; a low p-value, usually less than $P=0.05$, describes a low likelihood of results occurring by random chance and thus a high probability that the results describe a nonrandom pattern in nature. Thus, after comparing all experimental conditions and calculating the respective P-values, the relationship between average percentage of far branch radii for trees with south aspects and the average percentage of far branch radii for trees with north aspects is likely nonrandom. Therefore, these results present a possible trend in the natural growth of trees with slopes facing north versus south. (south $\mu=76.27\%$, north $\mu=64.86\%$, $P=.03$, $F_3=3.06$) (Figure 4) Other relationships were not significant (Table 1).

Our results correlating the far branch percentage and near building story height were significant, although the overall relationship was positive and weak. While this trend in the data is supported by a low P-value, there is no correlation between nearest building story height and percentage of far branches comprising the branch diameter, as measured by the R^2 value. ($P=2^{-16}$, $R^2=.03$, $F_{87}=13.78$). An R^2 measures the proportion in variation in the dependent variable that can be explained by pressures inflicted by the independent variable—a low R^2 value can be interpreted as a low likelihood that the changes in the independent variable effect the changes in the dependent variable. In this case, the low R^2 value can be interpreted as the nearest building story height having low likelihood of relating to the percentage of far branches comprising the branch diameter (Figure 5).

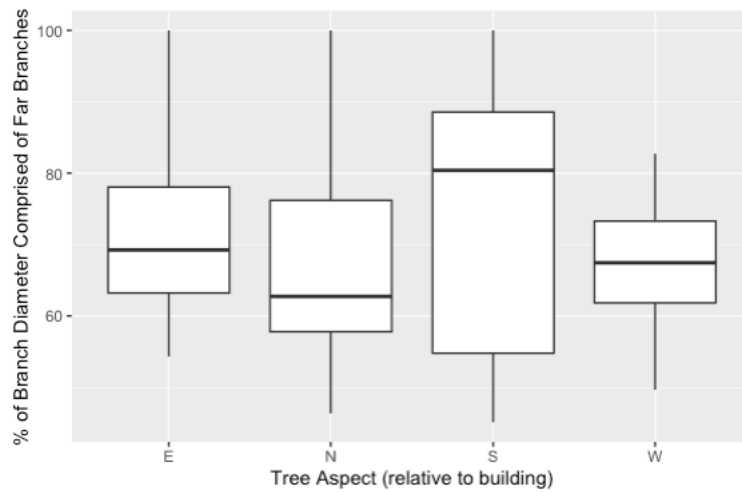


Figure 4 The relationship between the percentage of branch diameter comprised of far branches and tree aspect relative to its nearest building for trees in Capitol Hill, Seattle, WA. Our measurements were collected in November, 2019. Results are statistically significant ($P=.03^*$, $F_3=3.06$).

P value	
Possible Tree Orientation Combinations	
N-E	0.34
S-E	0.66
W-E	0.72
S-N	0.03*
W-N	0.93
W-S	0.14

Table 1 The statistical significance of each tree aspect combination. It includes the results for a Tukey's multivariate test, from which p-values were determined. Results are that $P<.05$ are statistically significant.

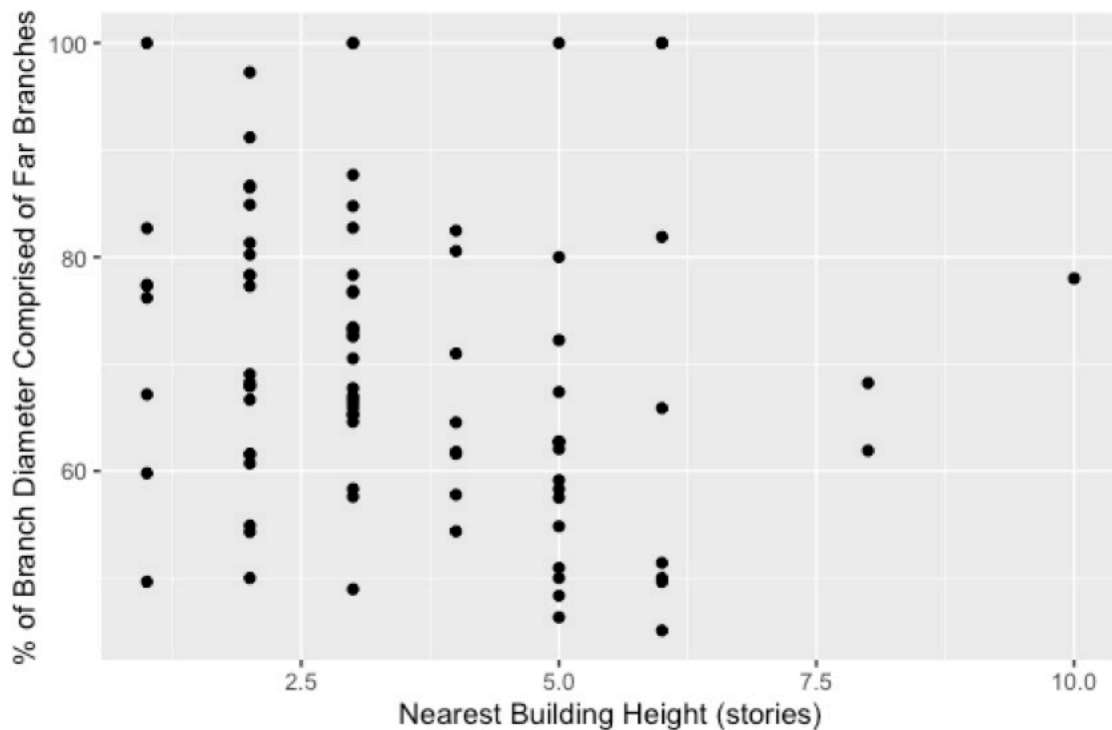


Figure 5 The relationship between the percentage of branch diameter comprised of far branches and the height of the tree’s nearest building for trees in Capitol Hill, Seattle, WA. Our measurements were collected in November, 2019. There is a significant weak positive relationship between the two variables ($P= 2^{-16}$, $R^2= .03$, $F_{87}=13.78$).

Discussion

Ultimately, we found that there is only statistically significant evidence for the relationship between trees with south aspects versus trees with north aspects and percentage of branch diameter comprised of far branches (Figure 4). Thus, the hypothesis that a) trees to the north and east of their closest building will have a higher percentage of far branches that make up their diameter than trees to the west and south of their buildings, was incorrect. Our data claims nothing statistically significant regarding relationships between any other direction combination.

Similarly, we found that there is no correlation between far branch percentage and the height of the nearest building. Thus our hypothesis that b) trees nearest taller buildings will have a higher percentage of far branches that make up their diameter than trees nearest shorter buildings, was incorrect. Given that both hypotheses were opposite to our results, our assumptions as to how urban buildings affect tree branch growth were likely incorrect. However, it is possible that components of the mechanisms by which we made these assumptions, like sun and shade, are still impacting tree branch growth.

Initially, both of our hypotheses predicted that branches would be pressured to grow towards

sunlight. We believed that because our samples were collected from trees in the Northern Hemisphere, the west- and south-facing trees receive the most solar radiation during their growing season, and north- and east-facing trees are mostly in the shade, causing them to grow their far branches in search of sunlight. This could still be true. However, since near branch radius was more or less controlled (<5m), the far branches were the only ones experiencing high variability. Thus, trees with south aspects that received sunlight grew their branches out, away from the building, as they captured the increased energy to do so. The trees with north aspects that were more shaded and received less sunlight did not have as much energy to put into branch growth (Rincon and Huante 1993). This could explain the reduction in far branch percentage we saw in trees with north aspects.

Furthermore, our data did not reflect our predictions about far branch percentage and the height of the nearest building to the tree. Specifically, trees nearest buildings under two stories still retained very high far branch percentages (Figure 5). Moreover, no trees nearest buildings over seven stories had over 80% of their tree branch diameter comprised of far branches. This leads us to believe that the length of the building's shadow is less significant than the tree's aspect relative to the building. Trees may spend little time in large shadows without impacted growth patterns. Instead, the amount of time the tree spends in the sun due to the aspect of the tree to its closest building most likely has a greater impact on tree branch growth patterns, regardless of how large it is (King 1997).

The trends exhibited still pose urban health hazards. First, longer branch growth into streets continues to impact urban environments, though simply on trees with a south aspect rather than north. The further the branch grows away from its attachment site, the greater the stress exhibited on that attachment site, increasing the potential for breakage, especially in extreme weather conditions (Bartlett Tree Experts 2016). Furthermore, the longer the far branch, the higher percentage of the branch that is likely to cover people, property, and traffic. Additionally, the greater the far branch percentage that makes up the tree's branch diameter, the less efficient the counter balance is on the other side, heightening the chance for branch abnormalities that undermine structural integrity (Bartlett Tree Experts 2016).

There are also ways that trees can be considered hazardous but not of immediate physical threat; for example, the rise of trees in urban areas is an early symptom of gentrification (Bataglia et al. 2014). While there are no studies to show urban-tree planting can cause gentrification, large scale tree planting goals are often associated with broad, green infrastructure projects that increase the cost of owning and renting property in the surrounding area. For example, a study in Portland, Oregon, a city of comparable size and age to Seattle with similar seasonal sunlight patterns, found that tree planting is associated with neighborhood-level gentrification, although the magnitude of the association was small, and increased with tree age (Donavan et al. 2021).

Thus, accounting for tree growth patterns may also impact the cost of tree upkeep and make trees more accessible in low-income neighborhoods of urban environments. Our study predicts that trees with south aspects will grow further into street traffic and problematize urban development, thus requiring greater upkeep. In order to make urban infrastructure and trees accessible to low-income neighborhoods in the Northern Hemisphere, we advise planting trees with north aspects, as they

will likely require less upkeep and are less likely to cause potential hazards. Trees with south aspects relative to buildings should be planted an appropriate distance from the building to accommodate symmetrical branch growth and account for these trends.

Future research may focus on urban trees with variant levels of shade tolerance and responses to urban pressures. Additional work could also focus on obtaining records of hazardous trees in urban environments to analyze their respective aspects. This would broaden sample size and also bridge the link between the potential for trees to become hazardous and actual hazardous trees. Another area of study regarding the hazard potential of trees would be to test for the structural integrity of a branch by assessing the strength of its attachment point. These research approaches will continue the conversation started in this study and continue to maximize the benefits of urban forestry by understanding the environmental conditions that may help urban planners avoid potential safety hazards that incompatible trees pose to urban residents. Hopefully, trees with less hazard potential will require less upkeep and in turn provide equitable access to trees in all urban areas.

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References

- Battaglia M, Buckley GL, Galvin M, Grove M. 2014. It's not easy going green: obstacles to tree-planting programs in east Baltimore. *Cities and the Environment*. 7(2): 1-14.
- Donovan GH, Prestemon JP, Butry DT, Kaminski AR, Monleon VJ. 2021. The politics of urban trees: Tree planting is associated with gentrification in Portland, Oregon. *Forest Policy and Economics*. 124. <https://doi.org/10.1016/j.forpol.2020.102387>
- Honda H, Fisher JB. 1978. Tree branch angle maximizing effective leaf area. *Science*. 199(4331): 888-890.
- Jim CY. 1998. Impacts of intensive urbanization on trees in Hong Kong. *Environmental Conservation*. 25(2): 146-159.
- King DA. 1997. Branch growth and biomass allocation in *Abies amabilis* saplings in contrasting light environments. *Tree Physiology*. 17(4): 251-258.

Konijnendijk CC, Ricard RM, Kenney A, Randrup TB. 2006. Defining urban forestry—a comparative perspective of North America and Europe. *Urban Forestry & Urban Greening*. 4(3-4): 93-103.

Loehle C. 1986. Phototropism of whole trees: effects of habitat and growth form. *American Midland Journalist*. 116(1): 190-196.

Mullaney J, Lucke T, Trueman SJ. 2015. A review of benefits and challenges in growing street trees in paved urban environments. *Landscape and Urban Planning*. 134: 157-166.

Nowak DJ, Greenfield EJ. 2018. US Urban forest statistics, values and projections. *Journal of Forestry*. 116(2): 164-177.

Pokorny J. 1992. *Urban tree risk management: a community guide to program design and implementation*. St. Paul (MN): USDA Forest Service, Northeastern Area, State and Private Forestry.

Quickfacts: Seattle city, Washington; United States. 2019. United States Census Bureau [accessed October 25 2019]. <https://www.census.gov/quickfacts/fact/table/seattlecitywashington,US/PST045218>.

R Core Team. 2019. *R: A language and environment for statistical computing*. R Foundation for Statistical Computing, Vienna, Austria. URL <http://www.R-project.org/>.

Rincon E, Huante P. 1993. Growth responses of tropical deciduous tree seedlings to contrasting light conditions. *Trees*. 7(4): 202-207.

Structural pruning [blog]. 2016 December 6. Bartlett Tree Experts [accessed October 21 2019]. <https://www.bartlett.com/blog/2016/12/tree-pruning/structural-pruning>.

Ulmer JM, Wolf KL, Backman DR, Tretheway RL, Blain CJA, O'Neil-Dunne JPM, Frank LD. 2016. Multiple health benefits of urban tree canopy: the mounting evidence for a green prescription. *Health & Place*. 42: 54-62.



Full-Length Research Articles

This section of the journal is dedicated to full-length research projects in any discipline. These might be final essays for a class, a capstone project, a study abroad essay, an independent study, or any multi-authored papers for which the student contributor is first author. We have chosen not to separate these essays into disciplinary divisions, but we do indicate the major field of study for each author. These essays have been chosen for their academic promise, for their participation in Seattle University's vibrant research community, and for their representation of majors across the university.

Beyond the Birds and the Bees: Sex Education and its Impact on Communication, Self-Efficacy, and Relationships

Katie Anderson, Stella Roth, and Talia Rossi, Psychology

Faculty Mentor: Michael Spinetta, PhD, Psychology

Faculty Content Editor: Michael Spinetta, PhD, Psychology

Student Editor: Tori Almond, Psychology

Abstract

Because rates of sexual activity increase significantly during adolescence, young people are at an especially high risk for negative sexual health outcomes, including sexually transmitted infection (STI) transmission, early pregnancy, and sexual violence. Current research reveals the effectiveness of comprehensive sex education (CSE) programs in combatting these outcomes, with students who participate in CSE reporting having better knowledge and feeling more prepared to face important decisions regarding their health. Research also shows that knowledge of sexual health resources impacts self-efficacy and benefits overall sexual health, with sexual resourcefulness showing direct ties to learned resourcefulness and sexual self-efficacy. The present study looks at how an individual's sex education experience (for example, topics discussed, depth of discussion) may impact their ability to communicate their sexual health needs and their willingness to access resources. In addition, this study aims to understand the link between sex education experience and relationship satisfaction later in life, a phenomenon which very few existing studies address. Our findings showed significant positive relationships and differences in communication comfort, self-efficacy, and relationship satisfaction such that people who perceived their sex education experiences to be more inclusive also demonstrated higher scores in the aforementioned areas of focus.

Introduction

Although sex education programs have been a component of United States public school curricula for decades, there is continued debate over how those programs should be taught in order to prevent the consequences of unsafe sexual activity. The most common consequences are unplanned pregnancy, HIV and STI transmission, and sexual violence, all of which increase significantly during adolescence (Hall et al., 2019; Mustanski et al., 2015; Walcott et al., 2011). The two main approaches to combatting these issues are abstinence-based sex education and comprehensive sex education (CSE). While abstinence-based sex education tends to portray sex in a negative way, encouraging youth to refrain from sexual activity, CSE provides youth with the information they need to practice safe sex if they so choose. CSE aligns with the World Health Organization (WHO)'s definition of sexual health, taking a more sex-positive approach. CSE covers a variety of sex-related topics, such as gender expression, sexual and reproductive health, HIV, sexual rights and citizenship, pleasure, violence, diversity, and relationships (de Castro et al., 2018; Brickman & Willoughby, 2017; Mustanski et al., 2015).

Multiple studies suggest that CSE curricula covering a wide range of topics is most effective at promoting safer sex. In a sample of high school students exposed to CSE, those given information on sexual and reproductive health and HIV had an increased ability to identify effective contraceptives (de Castro et al., 2018). In a sample of adolescent males, receiving instruction about birth control methods and also how to say “no” to sex was positively associated with dual contraceptive use compared to no use. For each additional sex education topic respondents were exposed to, their odds of using dual methods were 47% greater compared to no use (Jaramillo et al., 2017). CSE's sex-positive approach has also been shown to resonate better with young adults than a sex-negative approach. One study that used text message-based sex education intervention found that sex-positive messages were perceived as more believable and persuasive, affirming the idea that when it comes to promoting sexual health, focusing on the benefits of certain behaviors is more impactful than dwelling on the consequences (Brickman & Willoughby, 2017).

One component of CSE is the exploration of gender expression and sexual orientation. Information on these topics is especially important for LGBTQIA+ youth, a population that experiences sexual health issues at disproportionate rates. These sexual health inequities can be driven by lack of parental and peer support and community services, but they are especially reinforced by deficits in school-based sex education programs (Mustanski et al., 2015). Research shows that providing queer sex education to LGBTQIA+ youth can significantly improve their sexual health knowledge and inclination to practice safe sex, while also promoting relationship skills and self-acceptance. In a sample of LGBTQIA+ youth exposed

to online queer sex education, there was significant improvement in knowledge of sexual functioning, HIV and STIs, and contraception, as well as increased communication skills and connectedness to the LGBTQIA+ communities (Mustanski et al., 2015).

In addition to providing knowledge surrounding sexual health, CSE also emphasizes the promotion of individual wellbeing and healthy relationships in youth. However, there is a deficit to the healthy relationship component when it comes to state policy. In a content analysis of US sex education policies, it was discovered that only approximately half of US states addressed relationship issues (that is, healthy relationships, sexual decision-making, and sexual violence), and few states required content on communication about sexual consent (Hall et al., 2019). While there is a body of research that examines the effectiveness of sex education on outcomes like pregnancy and STIs, there is a paucity of research on the outcomes of sex education programs with a healthy relationship component. More research is needed on the effects of relationship education, since it could result not only in more supportive and stable relationships among young couples, but also lower rates of dating violence and intimate partner violence (Hall et al., 2019). Relationship health and sexual health are also linked, with research showing that high school students exposed to relationship education during CSE had 20% higher odds of affirming that they could convince their partner to use condoms (de Castro et al., 2018).

While abstinence-based sex education and CSE tend to be the most common formats for sex education, there are other emerging forms of curricula. Rights-based sex education places an intentional focus on the human right of access to adequate healthcare and information about sexual health topics to empower students by providing a more holistic view of sexual health with classroom topics such as sexuality, equality, and healthcare access (Rohrbach, 2015). Ultimately, research demonstrates that students with rights-based curricula scored higher on knowledge of sexual health, relationship rights, self-efficacy, and resource access (Rohrbach, 2015). Peer-led curricula have also been created to address the “awkwardness” and stigma surrounding sex education that is often depicted in media. Instead of promoting learning through adults or teachers, these curricula put peer leadership at the forefront by training students to spearhead courses. Peer-led programs can create a space for more open and honest communication that may not happen in adult-led courses. One study on peer-led sex education courses found that the conversational nature of these classes allowed for a free flow of discourse, alleviating the stigma of asking questions that may be deemed uncomfortable or awkward (Layzer et al., 2017). The results of this study indicated that 9th graders showed significant improvements in learned knowledge by the end of the course and 11th and 12th grade leaders showed improvement in their own knowledge and leadership skills (Layzer et al., 2017).

A newer form of sex education takes learning outside of the classroom setting and shifts it to a virtual one. In one study on the feasibility of web-based HIV and STI prevention,

researchers found that the interactive nature of online programming was an effective way for learning that stimulated discussion among participants (Widman et al., 2017). Participants engaged in a program, Health Education And Relationship Training (HEART), which aimed to enhance sexual decision-making and self-efficacy. Results from this online program showed increased understanding of HIV and STI content, as well as a desire to share this information with peers in the next three months. Another study looked at the effectiveness of an online program called *Media Aware* that combines media literacy education (MLE) with sex education. The results of the *Media Aware* program showed the following: an increase in self-efficacy and intentions to use contraception if participants were to engage in sexual activity; enhanced positive attitudes, self-efficacy, and intentions to communicate about sexual health; and an overall increase in sexual health knowledge in adolescents. Results also showed a decrease in the acceptance of dating violence and strict gender roles (Scull et al., 2018). Online programs can be used as effective tools for educational settings that are engaging and informative, while also allowing for participants to go at their own pace and learning level.

The WHO defines self-efficacy as “beliefs that individuals hold about their capability to carry out action in a way that will influence the events that affect their lives” (Smith, 2006). This draws a connection to sex education because as students are taught about consent, healthy relationships, and advocating for their own needs, they will gain autonomy. Self-efficacy and sexual resourcefulness (the feeling of having control or knowledge in stopping unwanted sexual encounters) can be improved through programs that are more comprehensive, with additions of skill-based learning (Kennett, 2012). Research demonstrates connections between learning resourcefulness, communication skills, and being able to protect oneself from unwanted sexual encounters (Kennett, 2012), all topics that previous studies have shown to increase after implementing sex education programs.

For self-efficacy and resourcefulness to positively influence sexual health practices, there must be a level of comfort in initiating and continuing conversation. Although in other curricula peers have been essential for communication comfort, communication with adults and other authority figures can impact sex education. In one study, it was found that health professionals, educators, parental figures, and other authority figures can be influential in the acquisition of HIV/AIDs knowledge and understanding. Pediatric nurses are especially influential for adolescents acquiring sexual health knowledge and understanding at an early age (Mahat et al., 2016). It is crucial for parents and guardians to play a role in making youth feel comfortable communicating about their needs because improved communication can impact decision making regarding sexual activities and can reduce risk-taking behaviors (Villarruel, 2010). In another study, a parental program that emphasized ways to enhance communication led to increases in all three types of communication: general communication, sexual risk communication, and comfort with communication (Villarruel, 2010). These findings

are consistent with other research in that youth and parents with better communication skills can more effectively discuss subjects such as sexual health. Future studies should evaluate if communication impacts healthy decision-making and resource-seeking behaviors.

Our study seeks to investigate whether engaging in sex education programs impacts a person's ability to communicate their sexual health needs to people in their life, and their willingness to access resources. In addition, this study aims to understand the association between relationship fulfillment and sex education. In acknowledging the paucity of literature, our first goal is to examine whether the increase of inclusivity in sex education curricula leads to an increase in comfort when communicating about sexual health. Additionally, we aim to examine whether depth of discussion of sex education topics predicts comfort when communicating about sexual health and predicts higher levels of overall relationship satisfaction.

Methods

Participants

We distributed an anonymous Qualtrics survey through the SONA Systems software to psychology students at Seattle University. Additionally, the link to the survey was distributed through social media platforms like Facebook, Instagram, and Snapchat. The survey included questions about demographic variables, information of participants' sex education experiences, and space for qualitative responses.

Measures

Demographics. The average age of the sample was 22.43 years ($SD=7.27$). Participants also provided information pertaining to their racial identity, sex assigned at birth, gender identity, and sexual identity (Tables 1 & 2, Appendix A). Participants were asked about current college status and whether they attended Seattle University, the school where research was being completed. In order to maintain anonymity, all questions were made voluntary and participants could refuse to respond.

Sex Education Experience. Participants were asked to answer questions about past sex education experiences, including whether they had received sex education in an academic setting. Participants were asked in what grade they received sex education, what type of schooling best describes the place where they received sex education, whether they would describe their sex education as inclusive. Participants were also invited to share how organized religion influenced their lives, on a 5-point Likert scale from 1 (not at all) to 5 (extremely).

Qualitative Portion. At the end of the survey, participants were asked to provide three

words to best describe their experience with sex education. They were also asked to provide what they want sex education curricula to include in the future and what they believe is important for people to know.

Sex Education Topics Scale. In order to determine whether past experiences of sex education could be termed in-depth, The Sex Education Topics Scale was adapted from Rohr, Reinl, and Baker (2018). Participants were first asked to select any topics that they remembered learning about in their sex education curriculum. A variety of topics such as consent, reproduction systems, sexually transmitted infections, and sexual satisfaction were included. If a topic was selected, the participant was asked to describe the depth of topic coverage in their sex education curriculum. The operational definition for the depth of coverage was quantified in a 3-point Likert Scale. Lower scores reflect that there was no more than a mention or brief conversation about topics. Higher scores indicate in-depth conversations that contributed to deeper understanding.

Communication Scale. To assess level of comfort in communicating about sexual topics, the Communication Scale was adapted from Rohr, Reinl, and Baker (2018). This scale asks participants to indicate how comfortable they are talking about sex and sexual health with on-campus resources, medical professionals, sexual partner(s), family members, teachers and professors, and close friends. It uses a 7-point Likert scale where lower scores reflect lower levels of comfort in sexual health communication and higher scores reflect higher levels of comfort.

Relationship Satisfaction Scale. The Relationship Satisfaction Scale was adapted from the book *Ten Days to Self-Esteem* by David D. Burns, M.D. (1993). Participants in a romantic partnership are asked to rank their level of satisfaction with various aspects of their relationship on a 7-point Likert scale. Questions included topics such as intimacy and closeness and resolving conflicts and arguments. Lower scores reflect low relationship satisfaction, and higher scores reflect high relationship satisfaction.

Self-Efficacy Scale. The Self-Efficacy Scale was adapted from the General Self-Efficacy Scale (GSE) developed by Schwarzer and Jerusalem (1995). This 10-question scale provides statements regarding problem solving and the participant's ability to achieve goals. Participants are asked to rate the degree to which they relate to the given statements. The GSE was reduced to five questions and all answers were rated on a 5-point Likert scale. Lower scores reflect less skillfulness in problem solving and resourcefulness, while higher scores indicate better ability and more confidence in finding solutions to problems.

Sexual Communication Self-Efficacy Scale. To assess general self-efficacy, the Sexual Communication Self-Efficacy Scale was adapted from a scale created by Quinn-Nilas et al. (2015). Sexual Communication Self-Efficacy is understood as the comfort with engaging in different types of communication with a sexual partner. Participants are asked to determine

how comfortable they would feel discussing certain situations with their sexual partners on a 5-point Likert scale. A low level of comfort indicates a lack of self-efficacy in sexual communication and a high level of comfort indicates a high level of self-efficacy in sexual communication.

Results

Sex Education Experience

In order to gauge levels of experience with sex education, participants were asked whether they had received sex education in their lifetimes. Two hundred and twenty-one participants had received sex education and seven participants never received sex education. Participants were then asked to determine in what grades sex education was received. Fourteen participants received sex education in elementary school, 33 participants received sex education in middle school, 24 participants received sex education in high school, and 153 participants received sex education at multiple times. Participants were asked to determine if they thought their sex education could be described as “inclusive.” Forty-four participants believed that their sex education was inclusive, 56 participants believed that their sex education was neutral on inclusivity, and 126 participants believed that their sex education was not inclusive.

In order to test the hypothesis that individuals who perceive their sex education to be more inclusive will be more likely to feel comfortable having conversations regarding sexual health, a one-way ANOVA was run with inclusive sex education and communication comfort. There was a significant main effect for communication, $F(2,223)=31.049$, $p<.0001$, equal variances not assumed. Post-Hoc Games-Howell corrected analysis revealed that participants who answered yes to perceived inclusivity in sex education had significantly higher communication scores than participants who answered no to perceived inclusivity of sex education, $p<.0001$, $d=1.22$. Post-Hoc Games-Howell corrected analysis revealed that participants who answered yes to perceived inclusivity in sex education had significantly higher communication scores than participants who answered neutral to perceived inclusivity of sex education, $p<.0001$, $d=1.094$. This finding reveals large practical significance.

In order to test an additional hypothesis that those who engaged with organized religion in a private school experience will have had a sex education curriculum with fewer topics discussed in depth, a two-way ANOVA was run using Religion, School Environment Type, and Topic Sum. There was no significant interaction between involvement in organized religion and school environment on depth of discussion of sex education topics, $F(3, 215)=1.348$, $p=.260$.

Sex Education Topics Scale

After initial tests were conducted for our hypothesis that individuals who indicate learning about a sexual health topic in depth will be more comfortable communicating about sexual health, we decided to create a deeper question to evaluate. Does the depth of discussion of topics in sex education predict comfort in communicating sexual health? A regression revealed that having more topics discussed in depth during their sex education significantly predicted communication comfort scores, $b=0.509$, $t(216)=6.53$, $p<0.001$, $r^2=0.259$.

A regression was used to determine if the number of topics covered in depth in participants' sex education curricula predicted their general self-efficacy. The findings demonstrated that depth of discussion of sex education topics significantly predicted general self-efficacy, $b=.146$, $t(217)=2.168$, $p=.031$, $r^2=.017$.

A regression was used to answer the question: does comfort communicating with various confidants about sexual topics predict general self-efficacy? The data showed that comfort communicating with various confidants about sexual topics significantly predicted general self-efficacy, $b=.279$, $t(227)=4.366$, $p=.001$, $r^2=.074$. After seeing the significant results of comfort in communicating and general self-efficacy, another question was posed. Does the depth of discussion of sex education topics predict sexual communication self-efficacy? Depth of discussion of sex education topics significantly predicted sexual communication self-efficacy, $b=.216$, $t(217)=3.252$, $p=.001$, $r^2=.042$.

In an effort to verify whether participants perceived their sex education to be inclusive, a one-way ANOVA was conducted. The findings suggest that participants accurately demonstrated whether their sex education was inclusive. There was a significant main effect for depth of discussion of topics, $F(2,213)=71.179$, $p<0.0001$, equal variances not assumed. Post-Hoc Games-Howell corrected analysis revealed that participants who answered yes to perceived inclusivity in sex education had significantly more in-depth sex education curricula than participants who answered neutral, $p<0.0001$, $d=1.320$. Post-hoc Games-Howell corrected analysis revealed that participants who answered yes to perceived inclusivity in sex education had significantly more in-depth sex education curricula than participants who answered no, $p<0.0001$, $d=2.016$ (Figure 4, Appendix B).

Communication Scale

A one-way ANOVA was conducted to investigate the perceived inclusivity of participant's sex education curricula and whether it influenced their comfort communicating about sex. There was a significant main effect for communication, $F(2,223)=31.049$, $p < .0001$, equal variances not assumed. A Post-Hoc Games-Howell corrected analysis revealed that participants who answered yes to perceived inclusivity in sex education had significantly higher communication scores than participants who answered both no to perceived inclusivity,

$p < .0001$, $d=1.22$, and neutral to perceived inclusivity, $p < .0001$, $d=1.094$. This supported the hypothesis that individuals who perceive their sex education to be more inclusive would be more likely to feel comfortable having conversations regarding sexual health (Figure 1, Appendix B).

To further analyze the effects of different sex education topics on comfort when communicating about sex, multiple independent samples t-tests were conducted. There were significant differences in communication for participants who discussed consent ($t(223.748)=3.385$, $p < .001$, $d=.44$), healthy relationships ($t(222.336)=2.1$, $p < .037$, $d=.27$), sexual health resources ($t(200.408)=3.705$, $p < .0001$, $d=.49$), sexual communication ($t(78.598)=6.071$, $p < .0001$, $d=.98$), and sexual satisfaction ($t(42.037)=7.589$, $p < .0001$, $d=1.50$) during sex education compared to those who did not.

Relationship Satisfaction Scale

Multiple linear regression analyses were conducted to explore the potential relationships between depth of discussion of sex education topics, self-efficacy discussing sexual topics, and relationship satisfaction. Depth of discussion of sex education topics significantly predicted both relationship satisfaction ($\beta=.278$, $p=.001$, $r^2=.070$) and sexual communication self-efficacy ($\beta=.216$, $p=.001$, $r^2=.042$). Additionally, sexual communication self-efficacy significantly predicted relationship satisfaction ($\beta=.245$, $p=.004$, $r^2=.053$). (Figure 2, Appendix B).

Multiple independent samples t-tests were conducted to analyze the impact of discussing certain topics during sex education on relationship satisfaction in the future. Tests were run to compare the mean relationship satisfaction scores of those who did and those who did not discuss sexual communication during sex education, and also for those who did and those who did not discuss healthy relationships during sex education. There was a significant effect for relationship satisfaction, $t(109.838)=3.499$, $p=.001$, $d=.594$, such that those who discussed sexual communication during sex education received higher scores than those who did not (equal variances not assumed). There was also a significant effect for relationship satisfaction, $t(110.648)=2.122$, $p=.036$, $d=.371$, such that those who discussed healthy relationships during sex education received higher scores than those who did not (equal variances not assumed).

Lastly, chi-squared tests of independence were run to determine if certain elements of relationship satisfaction differed based on what topics were discussed during sex education. Level of satisfaction with intimacy and closeness in relationships differed by whether healthy relationships were discussed during sex education, $\chi^2(4, N=137)=10.39$, $p=.034$. Additionally, level of satisfaction with communication and openness in relationships differed by whether sexual communication was discussed during sex education, $\chi^2(5, N=139)=12.06$, $p=.034$.

General Self-Efficacy Scale

In an effort to test our third hypothesis that individuals with high self-efficacy and high sexual communication self-efficacy will be more comfortable communicating sexual health needs with medical professionals and other confidants, a univariate analysis of variance was conducted to find interactions between variables. The findings revealed that there was a significant main effect for general self-efficacy, $F(2,227)=4.159$, $p=0.017$. There was a significant main effect for sexual communication self-efficacy, $F(2,227)= 8.119$, $p<0.001$. There was no significant interaction between General Self-Efficacy and Sexual Communication Self-Efficacy on Communication Scores $F(2,2)=1.064$, $p=0.347$.

Because of the results that we found on the univariate analysis described previously, we wanted to test for main effect instead of interaction. Therefore, to further test our third hypothesis, we conducted a one-way ANOVA. There was a significant main effect for communication, $F(2,225)= 7.499$, $p=0.001$, equal variances assumed. Post-hoc Tukey HSD corrected analysis revealed that participants with high-levels of general self-efficacy had significantly higher communication scores than those with medium-levels of general self-efficacy $p=0.001$, $d=0.597$. Post-hoc Tukey HSD corrected analysis revealed that participants with high levels of general self-efficacy did not have a significant difference in communication scores compared to those with low levels of general self-efficacy $p=0.438$.

To find whether general self-efficacy predicted comfort in communication with various confidants, a regression was conducted. General self-efficacy significantly predicted communication comfort scores, $b=0.509$, $t(226)=4.366$, $p<0.001$, $r^2=0.0078$.

In determining if Sexual Communication Self-Efficacy predicted general self-efficacy, we ran a regression and found that sexual communication self-efficacy significantly predicted general self-efficacy, $b=.255$, $t(227)=3.961$, $p=.001$, $r^2=.061$ (Figure 3, Appendix B).

To find significant mean differences in general self-efficacy levels between perceived inclusivity of sex education curriculum, independent t-tests were conducted. The data revealed that there was a significant effect for general self-efficacy, $t(168)=2.469$, $p=.015$, $d=.431$, with those who considered their sex education inclusive receiving higher scores than those who didn't, equal variances assumed.

Sexual Communication Self-Efficacy

To determine whether individuals with high self-efficacy and high sexual communication self-efficacy will be more comfortable communicating sexual health needs with medical professionals and other confidants, a one-way ANOVA was run with Sexual Communication Self Efficacy and Communication Scores. There was a significant main effect for communication, $F(2,225)=8.680$, $p<0.0001$. Equal variances assumed. Post-hoc Tukey HSD corrected analysis revealed that participants with high level sexual communication self-

efficacy had significantly higher communication comfort scores than those with medium-level of general self-efficacy $p=0.002$, $d=0.553$. Post-hoc Tukey HSD corrected analysis revealed that participants with high levels of sexual communication self-efficacy had significantly higher communication comfort scores compared to those with low levels of sexual communication self-efficacy $p=0.024$, $d=0.909$.

Qualitative Responses

Word frequency counts were conducted to find which words were most used for participants to describe their experience in sex education. The three most commonly reported words were abstinence (25 responses), heteronormative (25 responses), and informative (15 responses). At the end of the survey, participants were also asked to describe what they would like to see in future sex education curricula. General responses showed that participants would like to see more holistic and inclusive approaches to sex education, with emphasis on LGBTQIA+ topics, consent, healthy relationships, and sexual and reproductive health. Some of the most impactful responses were:

1. There needs to be a more holistic approach to sex education and an effort to make it more real [...] by talking about the “difficult” topics with the help of guest speakers that specialize in the major areas of sex education. I also think that including political and intense conversation is necessary in order show that different people have different views and to teach all students healthy ways to cope with that reality instead of fighting it in a non-productive way.
2. I believe that future sex education should be more inclusive of the LGBT+ community as well as the fluidity of sexuality in general. I believe they should be more open to reproductive rights and the oppression of women’s sexual health. I also believe it, above all things, to inform the people of healthy relationships, both physical, emotional, and mental, and how that looks like in different relationships. As well as the importance of consent.
3. It is important that people can know who they can reach out to for help and education even if it is not advertised in schools.

Discussion

One main interest that was addressed in the results of the study is how the comprehensiveness of sex education curricula, specifically the depth of discussion of topics,

impacts people's comfort in communicating their needs to various confidants in their lives. One hypothesis of this study proposed that higher levels of inclusivity in sex education curricula would lead to higher levels of communication about sexual health. The findings demonstrated that participants who answered "yes" to perceived inclusivity in sex education had higher communication scores than participants who answered both "no" and "neutral" to perceived inclusivity. The data revealed that having inclusive sex education can benefit one's comfort in communicating, which is crucial for one's health. Specifically, communicating with medical professionals and campus resources is crucial in getting the help that people need with their personal health matters.

As is mentioned in the literature review, learning effective communication skills has the potential to impact a person's decisions regarding the sexual activities in which they participate, and it can also result in less risky sexual behaviors. This is important in making sure that sexual health needs are being met, that people are staying safe and emphasizing consent in sexual encounters, and that people know how to ask for help when needed. The findings in this study are in alignment with existing research in the field; however, there is still a major gap in the research. More extensive research needs to be conducted to determine if the communication skills that are gained in skill-based sex education curricula results in help-seeking and problem-solving behaviors. Specifically, research needs to address an individual's comfort in asking for help with sexual health and sexual problems: for example, STIs and unwanted pregnancies.

Sex education can have effects for adolescents and young adults beyond knowledge of anatomy and prevention of unwanted pregnancy and STIs. Alternatively, this study demonstrates how learning about sex education in an environment that promotes healthy communication and in-depth sex education topics can lead to higher rates of self-efficacy. The results of this study's regressions show that sexual communication self-efficacy, depth of discussion of sex education topics, and communication comfortability all predicted higher rates of general self-efficacy. These higher rates of self-efficacy dictate an increase in decision-making, problem-solving, and communication skills, which can provide adolescents and young adults with skills that will aid them in their everyday lives. They will feel more task-oriented, confident when faced with new environments, and secure in their ability to reach out for help. These skills move beyond sexual health and prepare a young person to be a well-informed adult.

Additionally, relationship education can equip adolescents with the necessary skills to engage in more positive interactions and maintain healthier relationships throughout their lives. Participants who discussed sexual communication and healthy relationships during sex education scored higher on relationship satisfaction than those who did not, which reveals

that these topics may be valuable assets to sex education curricula. The data also shows that discussion of healthy relationships during sex education may be tied to level of satisfaction with intimacy and closeness in one's relationship, and the discussion of sexual communication during sex education may be tied to level of satisfaction with communication and openness in one's relationship. These results reveal that having these kinds of discussions during youth can influence how healthily people engage with romantic and sexual relationships later on in life. Being able to pinpoint differences between healthy and unhealthy relationships, as well as knowing what healthy communication around sex should entail (for instance, consent, protection, and pleasure) may serve as helpful knowledge as adolescents grow and begin navigating relationships of their own.

One main hypothesis of this study proposed that depth of discussion of sex education topics would predict future relationship satisfaction, which was confirmed by our results. Depth of discussion of sex education topics significantly predicted both relationship satisfaction and sexual communication self-efficacy. In addition, sexual communication self-efficacy significantly predicted relationship satisfaction, revealing the interconnectedness of all three variables as well as the potential benefits of providing comprehensive, in-depth sex education to youth. By providing a thorough description of topics and creating a space for deeper questioning and discussion, educators may be able to provide students with the groundwork to engage in healthier romantic and sexual relationships later in their lives. These findings help fill the gap in research around the potential benefits of healthy relationship education and support the notion of integrating relationship education into sex education curricula at a policy level. Future research should consider how both positive components of relationships (such as fun, respect, safety, and acceptance) and negative components (such as sexual violence and emotional abuse) are influenced by relationship education.

Limitations

The sample used in this study was one of convenience, and therefore made the results less generalizable to the greater population. Additionally, a large portion of the sample was white, female-identifying participants. This study relied on self-reported information from participants that included questions on attitudes and feelings towards subjects. Having solely a self-report format that relies on participant subjectivity can be a limitation because of the passage of time, strong individual attitudes and feelings towards the topic, and potential inconsistencies between participants. A major limitation was that our study was conducted during the COVID-19 pandemic, which may have altered participants' capacity to provide information or complete sections fully. This survey was distributed alongside many other research surveys, which could have resulted in participant burnout.

Future Research

To build upon our results, future research should consider the different types of sex education curricula available for all ages of learners. It also should delve into the differences in school environments and their chosen curricula, and how those differences may influence sexual health outcomes. Currently, there is a lack of research on inclusive sex education that needs to be further addressed, as it is important to understand the differences in curricula that are perceived as inclusive versus curricula that are not. Lastly, it is important to consider the benefits of sex education on a variety of other outcomes not strictly related to sexual health, such as healthy relationship dynamics.

Appendix A

Table 1: Gender Identity Frequencies and Percentages

<i>Gender Identity</i>	<i>Frequency</i>	<i>Percentage</i>
<i>Female</i>	170	74.9%
<i>Male</i>	45	19.8%
<i>Non-Binary</i>	8	3.5%
<i>Transgender</i>	4	1.8%

Table 2: Sexual Identity Frequencies and Percentages

<i>Sexual Identity</i>	<i>Frequency</i>	<i>Percentage</i>
<i>Heterosexual</i>	130	57.3%
<i>Bisexual</i>	42	18.5%
<i>Queer</i>	23	10.1%
<i>Questioning</i>	14	6.2%
<i>Homosexual</i>	10	4.4%
<i>Pansexual</i>	7	3.1%
<i>Asexual</i>	1	0.4%

Appendix B

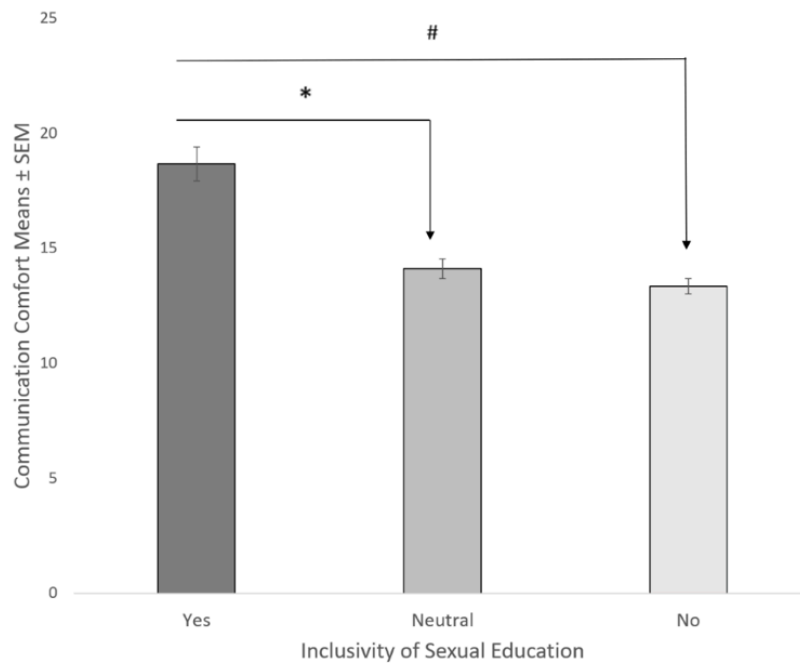


Fig 1. There was a significant main effect for communication, $F(2,223)=31.049$, $p<0.0001$, equal variances not assumed. Post-hoc Games-Howell corrected analysis revealed that participants who answered “yes” to perceived inclusivity in sex education had significantly higher communication scores than participants who answered “no” to perceived inclusivity of sex education, $p<0.001$, $d= 1.22$. Post-hoc Games-Howell corrected analysis revealed that participants who answered yes to perceived inclusivity in sex education had significantly higher communication scores than participants who answered neutral to perceived inclusivity of sex education, $p<0.001$, $d= 1.094$. * $p<0.0001$; $p<0.0001$.

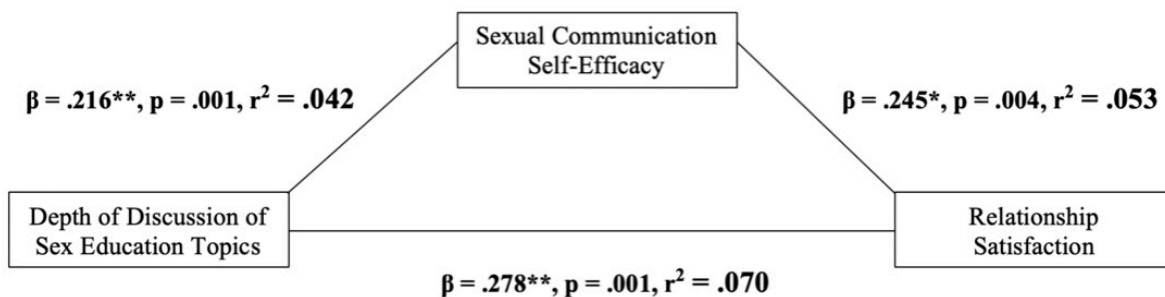


Fig 2. Multiple linear regression analyses were conducted to explore whether depth of discussion of sex education topics (Sexual Topics Scale) was predictive of relationship satisfaction (Relationship Satisfaction Scale) and self-efficacy discussing sexual topics (Sexual Communication Self-Efficacy Scale). Depth of discussion of sex education topics significantly predicted both relationship satisfaction and self-efficacy discussing sexual topics. Additionally, self-efficacy discussing sexual topics significantly predicted relationship satisfaction. ** $p < .001$, * $p < .05$.

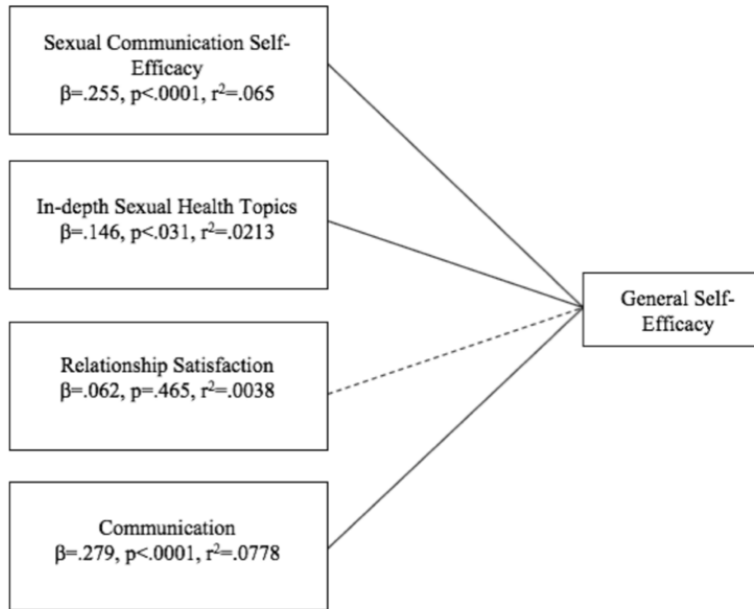


Fig 3. A linear regression analysis revealed that Communication, Depth of Discussion of Sex Education topics, and Sexual Communication Self-Efficacy all significantly predicted higher rates of General Self-Efficacy. Relationship Satisfaction was not predictive of higher rates of General Self-Efficacy. ** $p < .001$, * $p < .05$.

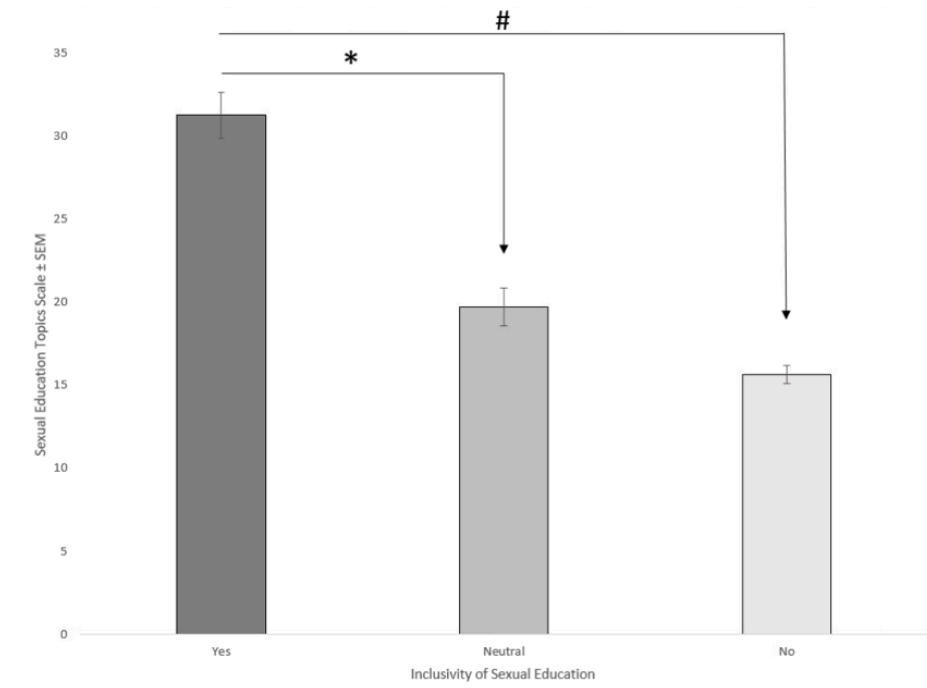


Fig 4 There was a significant main effect for depth of discussion of topics, $F(2,213)=71.179$, $p < .0001$, equal variances not assumed. Post-hoc Games-Howell corrected analysis revealed that participants who answered yes to perceived inclusivity in sex education had significantly more in-depth sex education curriculums than participants who answered neutral, $p < .0001$, $d=1.320$. Post-hoc Games-Howell corrected analysis revealed that participants who answered yes to perceived inclusivity in sex education had significantly more in-depth sex education curriculums than participants who answered no, $p < .0001$, $d= 2.016$. * $p < .0001$ # $p < .0001$

References

- Brickman, J., & Willoughby, J. F. (2017). 'You shouldn't be making people feel bad about having sex': Exploring young adults' perceptions of a sex-positive sexual health text message intervention. *Sex Education, 17*(6), 621–634. <https://doi-org.proxy.seattleu.edu/10.1080/14681811.2017.1332582>.
- de Castro, F., Rojas-Martínez, R., Villalobos-Hernández, A., Allen-Leigh, B., Breverman-Bronstein, A., Billings, D. L., & Uribe-Zúñiga, P. (2018). Sexual and reproductive health outcomes are positively associated with comprehensive sex education exposure in Mexican high-school students. *PloS one, 13*(3),1-15. <https://doi.org/10.1371/journal.pone.0193780>.
- Hall, W. J., Jones, B. L., Witkemper, K. D., Collins, T. L., & Rodgers, G. K. (2019). State policy on school-based sex education: A content analysis focused on sexual behaviors, relationships, and identities. *American Journal of Health Behavior, 43*(3), 506-519. <http://dx.doi.org.proxy.seattleu.edu/10.5993/AJHB.43.3.6>.
- Jaramillo, N., Buhi, E. R., Elder, J. P., & Corliss, H. L. (2017). Associations between sex education and contraceptive use among heterosexually active, adolescent males in the United States. *Journal of Adolescent Health, 60*(5), 534-540. <https://doi.org/10.1016/j.jadohealth.2016.11.025>.
- Kennett, D., Humphreys, T., & Calder, P. (2011). On young women becoming sexually resourceful: A pilot study. *Psychology of Self-Control, 1*-36.
- Kennett, D., Humphreys, T., & Schultz, K. (2012). Sexual resourcefulness and the impact of family, sex education, media and peers. *Sex Education, 12*(3), 351-368. <https://doi-org.proxy.seattleu.edu/10.1080/14681811.2011.615624>.
- Layzer, C., Rosapep, L., & Barr, S. (2017). Student voices: Perspectives on peer-to-peer sexual health education. *Journal of School Health, 87*(7), 513-523. DOI: 10.1111/josh.12519
- Mahat, G., Scoloveno, M.A., & Scoloveno, R. (2016). HIV / AIDS knowledge, self-efficacy for limiting sexual risk behaviors and parental monitoring. *Journal of Pediatric Nursing, 31*(1), 63-69. DOI: 10.1016/j.pedn.2015.06.015

Mustanski, B., Greene, G., Ryan, D., & Whitton, S. (2015). Feasibility, acceptability, and initial efficacy of an online sexual health promotion program for LGBT youth: The queer sex ed intervention. *Journal of Sex Research*, 52(2), 220–230. <https://doi-org.proxy.seattleu.edu/10.1080/00224499.2013.867924>

Quinn-Nilas, C., Milhausen, R. R., Breur, R. (2016). Validation of the sexual communication self-efficacy scale. *Health Education & Behavior* 43(2), 165-171. <https://doi.org/10.1177/1090198115598986>

Rohrbach, L. A., Berglas, N. F., Jerman, P., Angulo-Olaiz, F., Chou, C.-P., & Constantine, N. A. (2015). A rights-based sexuality education curriculum for adolescents: 1-year outcomes from a cluster-randomized trial. *Journal of Adolescent Health*, 57(4), 399-406. <https://doi-org.proxy.seattleu.edu/10.1016/j.jadohealth.2015.07.004>.

Scull, T. M., Kupersmidt, J. B., Malik, C. V., & Morgan-Lopez, A. A. (2018). Using media literacy education for adolescent sexual health promotion in middle school: Randomized control trial of Media Aware. *Journal of Health Communication*, 23(12), 1051-1063. <https://doi.org/10.1080/10810730.2018.1548669>

Smith, B. J. Tang, K.C., Nutbeam, D. (2006). WHO Health Promotion Glossary: new terms. *Health Promotion International*, 21(4), 340–345. <https://doi.org/10.1093/heapro/dal033>.

Villarruel, A., Loveland-Cherry, C., & Ronis, D. (2010). Testing the efficacy of a computer-based parent-adolescent sexual communication intervention for Latino parents. *Family Relations*, 59(5), 533-543. DOI: 10.1111/j.1741-3729.2010.00621.x.

Walcott, C. M., Chenneville, T., & Tarquini, S., (2011). Relationship between recall of sex education and college students' sexual attitudes and behavior. *Psychology in Schools*, 48(8), 828-842. <https://doi.org/10.1002/pits.20592>

Widman, L., Golin, C. E., Kamke, K., Massey, J., Prinstein, M. J. (2017). Feasibility and acceptability of a web-based HIV/STD prevention program for adolescent girls targeting sexual communication skills. *Health Education Research*, 32(4), 343-352. <https://doi.org/10.1093/her/cyx048>

Young, H., Turney, C., White, J., Lewis, R., & Bonell, C. (2019). Formative mixed method multicase study research to inform the development of a safer sex and healthy relationships intervention in further education (FE) settings: The SaFE Project. *BMJ Open*, 9(7), 1-13. <https://doi.org/10.1136/bmjopen-2018-024692>

At Home in King County: Educational Access in King County for Adult Somali Refugees

Colleen Cronnelly, '20, International Studies

**Faculty Mentor: Nova Robinson, PhD,
International Studies and History**

**Faculty Content Editor: Saheed Adejumobi, PhD,
History and Global African Studies**

**Student Editors: McCalee Cain, English and French, and
Grace Nikunen, Political Science and Philosophy**

Abstract

While there is global research on the topic of adult refugee education, there is limited research on the accessibility of education for adult refugees in King County, Washington. My research offers an analysis of educational accessibility in King County for refugees from the African nation of Somalia, which is the provenance of the largest refugee population in the area. I conducted interviews with representatives from local organizations, namely Refugee Women’s Alliance, Refugees Northwest, Seattle Public Libraries, and Literacy Source in order to gain a better understanding of the strengths and challenges faced by these organizations and the refugees they serve, particularly regarding educational services. I argue that adult refugee education must be culturally aware and trauma informed for refugees to achieve a more expansive level of success. Additionally, a diversity of programs is necessary to meet all educational needs. In order to ensure that these types of programs are available in King County, governments at the city, county, and state levels must allocate more funding to refugee resettlement. The ultimate goal of this research is to advocate for refugee success and independence through education, with an emphasis on fortifying coping mechanisms and producing new knowledge to meet new challenges.

Introduction

From his election in 2016 to his defeat in 2020, former President Trump's administration continually lowered the refugee admittance cap, allowing fewer and fewer refugees to find relative safety in the United States. Although Trump's restrictions have been celebrated in conservative circles that value American border security, he has been widely criticized elsewhere for turning his back on families escaping violence, famine, and persecution (Hightower, 2019). One critic of Trump's limited refugee admittance policies is Seattle Mayor Jenny Durkan. On November 14, 2019, Durkan voiced her support of refugee resettlement in Seattle in a letter to former Secretary of State Mike Pompeo (Hightower, 2019) echoing a decision made earlier in 2017 by the city of Seattle, King County, and the Seattle Foundation to provide \$2.25 million for refugee and immigrant services (King County, 2017). What remains unclear is the effectiveness of these services in integrating refugees into society once they arrive in Seattle. This paper will focus on one factor that determines a person's ability to integrate into a host society: their access to education.

Refugees require education, regardless of age, gender, or previous education status, and each person has different educational needs (Winchester, 2016). Arguably, refugees should first learn English in order to be independent members of society, able to perform basic functions such as going to the store, going to the doctor, calling the police, and other functions in their new communities. Additionally, professionals need to be reeducated within the context of American language and societal norms through universities and certification programs (Winchester, 2016). Education such as this ensures that refugees are given the tools to succeed socially and economically in their host communities, unlocking opportunities for advancement and community (Winchester, 2016).

This paper offers a comprehensive review of refugee access to education in King County, Washington. My initial research revealed a gap in secondary literature about refugee education in King County despite an abundance of research concerning refugee education globally. The limited secondary literature about refugees in King County focused primarily on Southeast Asian refugee resettlement in the 1970s and 1980s, and existing literature has in the past examined health-related risks and medical conditions instead of focusing on resettlement or education.

This paper specifically considers educational accessibility for adult refugees from Somalia. Numbering 2,560 people in 2019, Somalian refugees make up the largest group of refugees in King County (Washington State Office of Immigrant and Refugee Affairs, 2019). This paper uses secondary sources about refugee education on a global scale to provide a basis for primary source analysis relevant to King County, including federal, state, county and city policies, regulations, declarations, and interviews with representatives from local

non-governmental organizations (NGOs). From these sources, I compiled a summary of programs and services available for refugees in King County. I determine the necessity of culturally aware, trauma informed, and comprehensive educational programs for refugees. I conclude that the greatest (compounded and interrelated) barriers to both refugees seeking educational opportunities and organizations seeking to provide resources alike is limited available time on the part of refugees juggling many responsibilities, and inadequate funding allocated to organizations serving refugees. I argue that local governments can help refugees and organizations overcome these barriers by allocating more funds for refugee resettlement grants.

Defining “Refugee” and “Education”

For the purpose of this research, I will use the United Nations High Commissioner for Refugees definition of “refugee”:

a refugee is a person who, owing to well-founded fear of being persecuted for reasons of race, religion, nationality, membership in a particular social group or political opinion, is outside the country of his nationality and is unable or, owing to such fear, is unwilling to avail himself [*sic*] of the protection of that country; or who, not having a nationality and being outside the country of his [*sic*] former habitual residence, is unable or, owing to such fear, is unwilling to return to it. (Convention relating to the status of refugees, 1951, pg.152)

This definition differentiates refugees from internally displaced people, who are forced to flee their homes because of instability or violence there but do not cross state borders (McBrien, 2005). This definition also differentiates refugees from migrants, who choose to relocate to a new region or country for financial or personal gain (McBrien, 2005). This research will focus primarily on the experiences of refugees, who are arguably an especially vulnerable population. That being said, there are many similarities between the educational opportunities for migrants and refugees (McBrien, 2005). Because there are holes in the existing refugee literature, I will employ some sources pertaining to migrants.

Education is not easily defined. Beista explains that when we say “education” we are generally referring to one of five things: formal institutions, such as schools and universities; domains of practice, such as adult education or vocational education; processes associated with formal institutions and domains, such as lessons or lectures; activity of education, such as teaching or mentoring; and the outcome of education, such as a graduated person or an educated person (2015). However, even within these five meanings, there is uncertainty: for example, learning can take place outside of formal institutions, expanding the boundaries of

educational opportunities and calling for a more holistic understanding of what it means to be an educated individual. For the purpose of this research, I will be using a broad definition of education that includes the formal institutions traditionally associated with education as well as less-structured ways of learning new skills and information.

Background: Refugees in King County

Over the last 40 years, refugees have entered Washington State from a multitude of places and as a result of various historical traumas: for example, there was a spike in the numbers of Southeast Asian refugees entering Washington State following the Vietnam War, as well as an increase in refugees fleeing the Soviet Union following its collapse (Riley, 2015). Today, East Africans make up a significant portion of the refugee community due to regional conflicts that are a colonial legacy (Riley, 2015). Of the refugees that have settled in the state since 2003, refugees from Somalia rank third in population (Office of Immigrant and Refugee Affairs briefing book, 2019).

When discussing refugees, it is imperative to examine the unique reasons for displacement from their country of origin, also known as push factors. Somalia has struggled since its inception to maintain peace and order for a variety of reasons. In the nineteenth century, Somalia was divided into smaller territories controlled by its colonizers, Britain, Italy, and France, but in 1960 the constructed factions merged to form the United Republic of Somalia. After independence, Somalia struggled to maintain stability due to conflict amongst different ethnic groups and political parties. The lines and borders drawn by Europeans in Eastern Africa ignore the geography of local ethnic groups, resulting in many Somali people living in other states and many members of other ethnic groups living in Somalia. This causes uncertainty as to who has the right to rule in Somalia. Additionally, different regions of Somalia adopted competing political ideologies of Britain and Italy, creating a division about the best way to rule. Following conflicts with neighboring state Ethiopia in the 1980s, a series of coups and a civil war amongst clans vying for regional authority broke out in 1991. The devastation of the conflicts was compounded by devastating drought. Multiple iterations of peace treaties and pacts were created and broken. The United Nations, The Organization of African Unity, and many other nations have all tried various interventions to no avail. Campaigns by UN peacekeepers and the United States government only succeeded in escalating violence. A stable government has yet to be maintained in Somalia, resulting in continued violence (Lansford & Tom 2019). The conflicts rooted in colonial legacy persist to this day, and the Somali refugee population continues to grow as a result (Ferriss, Strode, & Shandra 2018). Because refugee resettlement offices try to place refugees in cities or areas that already have refugees of the same nationality, the Somali refugee population in Seattle is

steadily growing (Forrest, Mott, & Brown, 2014).

Somalian refugees face a multitude of challenges both before and after their arrival in the US. Ferriss, Strode, and Shandra's study on Somali refugee post-traumatic stress explained that before they are forced to leave their country, refugees experience trauma such as "catastrophic destruction of homes and communities, the murder of family members and neighbors, rape, being lost, torture, kidnappings[,] and bombings" (2018). As they flee, their trauma continues in the harsh and often violent conditions of overpopulated refugee camps. Stress and anxiety are compounded in these camps as refugees await news about their applications for refugee status through the US Refugee Admissions Program (Ferriss, Strode, & Shandra 2018). Once people arrive in the US, they must then struggle to build community within the context of American culture, especially when their own family unit is fractured by transit to the US (Ferriss, Strode, & Shandra, 2018). They must also grapple with a loss of professional or social status, for though in their home countries they may have been respected, affluent members of the community, in the US they are often stripped of their professional qualifications as a result of the relocation process and forced to search for other sources of income. (Ferriss, Strode, & Shandra, 2018). These factors combined may negatively impact the mental and physical health of refugees, which in turn may affect their experience of education (Ferriss, Strode, & Shandra, 2018).

Existing Literature: Global Refugee Education

In the following section, I will explain the necessity for adult refugee education and explores its various challenges. I will conclude with a discussion of some typical adult refugee education models to provide a context for my analysis of refugee education in King County.

Prioritizing Adult Refugee Education

Due to different interests and priorities, each country has unique goals and agendas regarding refugees and refugee services. Countries are categorized by social scientists as either a "transit country" or a "destination country." The International Organization for Migration (IOM) defines a transit country as "the country through which migratory flows (regular or irregular) move" (Perruchoud, & Redpath-Cross, 2011). Transit countries typically border a refugee's country of origin. The primary priorities of transit country governments are to provide temporary food and housing, and they often help people apply for refugee status so that they can continue on to their destination countries (Duvell, Molodikova, & Collyer, 2014). The ISO defines a destination country, also called third country, receiving country, or host country, as "the country that is a destination for migratory flows (regular or

irregular)” (Perruchoud, & Redpath-Cross, 2011). The primary priorities of destination country governments are to integrate refugees into their societies. This longer-term approach focuses on employment and community building (Duvell, Molodikova, & Collyer, 2014). Education—language acquisition especially—is necessary for both employment and community building. In the case of the Somali refugee experience, Kenya acts as a transit country and the US is a destination country (Ferriss, Strode, & Shandra, 2018).

After months or, more likely, years of displacement and trauma, refugees arrive in their new location with hopes of stability. Before that is possible, they must learn how to live independently in their new settings. For many adult refugees, true independence requires a level of education that allows them to work, be active in their children’s educations, and be financially autonomous. This typically means being conversant in the local language, having reading proficiency in that language, and possessing relevant technical skills (Stepping up: refugee education in crisis, 2018). Refugees obtain these skills, and therefore a measure of independence, through educational programs and classes (Benseman, 2014). From a psychological standpoint, education contributes to improved mental and social wellbeing as it allows adult refugees to build communities in their new setting (McBrien, 2005). While this is true for refugees of all ages, adult refugees take longer to adapt to their new environment than younger refugees (Khamphakdy-Brown, Jones, Nilsson, Russel & Klevens, 2006). It is for these reasons that the United Nations High Commissioner for Refugees (UNHCR) has determined that education is a pillar to emergency response, prioritized with nearly equal importance as food, water, and shelter (2018).

Adult refugee education after resettlement is also imperative because it improves the quality of education to which refugee children have access. Students are most likely to succeed when parents can have an active role in their children’s education; for example, when parents understand how to check grades and can attend parent-teacher conferences, their children are more likely to achieve satisfactory educational outcomes (McBrien, 2005). Additionally, the more education and language comprehension parents can attain, the less dependent they are on their children to act as translators. These child-translators bear the weight of family stress, causing them to feel obligated to provide stability for their family and thus negatively impacting the child’s education (McBrien, 2005). Teenage and young adult refugees often drop out of school in order to financially support parents who cannot work or can only work low-income jobs due to their level of education and language proficiency (UNHCR, 2018).

Challenges to Adult Refugee Education

Many of the frustrations facing refugees seeking an education are familiar to anyone who has learned a new language. In John Benseman’s study, interviewees described

the struggle of learning to pronounce and hear unfamiliar sounds in new languages, understanding people speaking too fast, and recalling new vocabulary (2014). However, there are additional barriers and frustrations that refugees face outside of language acquisition, such as health issues, family care, transportation, and understanding of available resources (Benseman, 2014). The most universal struggles were financial barriers, especially regarding higher education (Lipka, 2006), and time constraints (Benseman, 2014). Many refugees experience significant time constraints because of inflexible work schedules and familial responsibilities. As a consequence, refugees find themselves starved for time to attend classes or to study (Benseman, 2014).

A consistent challenge for highly educated refugees was that associated with the loss of professional certificates (Zolberg & Benda, 2001). In most cases, people fleeing their countries are unable to bring with them evidence of their academic qualifications, and even if they do bring their credentials, they may not be accepted because of varying national, state, and local standards (Zolberg & Benda, 2001). Therefore, many of these highly educated refugees cannot obtain a job in their field or continue their studies, limiting their ability to continue their careers: they can attempt to start over in an American school, or they can obtain a job for which they are overqualified (Zolberg & Benda, 2001). East Africans specifically expressed frustration over this “brain waste” (Balahadia, 2016, p. 22). As one man specifically stated, “I know many taxi drivers that have PhDs. It’s incredible that their assets can’t be recognized” (Balahadia, 2016, p. 22).

Another factor negatively impacting refugee education is the trauma of forced displacement. Trauma, which is “an event, series of events, or set of circumstances that is experienced by an individual as physically or emotionally harmful or threatening and that has lasting adverse effects on the individual’s functioning and physical, social, emotional, or spiritual well-being,” impairs the brain’s ability to make decisions, remember, and learn (Imad, 2020). Trauma impacts learning because chronic stress directs energy in the brain towards survival, causing atrophy in the parts of our brain that we require to process and remember new information (Imad, 2020). In the case of refugee learners, continuously uncertain circumstances and unforeseeable futures can cause refugees to worry about themselves and their immediate and extended families. This worry can manifest in short attention spans, nervous energy, and indifference to course topics (Benseman, 2014). The severity of refugee trauma demands that educators working with refugees are trained to accommodate adult learners with traumatic experience (Benseman, 2014).

Adult Refugee Education Programs

Because every refugee has a unique background of education and experience, a nearly unlimited number of programs and methods are in place around the world to educate adult refugees. Many programs work to teach the basic language proficiency necessary to enter the workforce, and in the US this is the most common type of program offered (Office of Refugee Resettlement, 2019). There are classes offered in reading, writing, and speaking in the English language, and some programs combine classes to also include job skills like digital literacy (Office of Refugee Resettlement, 2019). Some programs are targeted towards refugees with English literacy who need to expand their professional vocabulary for their target field of work or study (Balahadia, 2016). Other programs assist refugees in applying for scholarships, crafting resumes, and finding jobs (Lipka, 2006). Meanwhile, other programs such as low-literacy classes are geared towards people who must “learn how to learn” in their primary language (Benseman, 2014, pg. 98). Low-literacy classes demand highly experienced teachers, and often also utilize bilingual tutors (Benseman, 2014). The goals of these programs include assisting learners in recognizing letters, writing simple sentences, and developing conversational skills in the English language (Benseman, 2014). Other programs do not distinguish themselves based on the level of learner; rather, they target a specific demographic such as women, young adults, or people from specific countries (Balahadia, 2016). These programs focus on the challenges specific to these demographics. For example, a program working with women may spend a class learning how to discuss their children’s wellbeing with a teacher (Balahadia, 2016). The goal of having a variety of teaching methods is to ensure that there is an adequate form of education for all refugees, regardless of gender, age, previous education, or native language.

The literature surrounding adult refugee education focuses on language acquisition, and while language training is at the core of refugee education, it is insufficient to focus on language acquisition alone. The primary reason that refugees desire language education is so that they can work; however, in the job market, literacy is considered a minimum requirement for employment. Employers seek to hire employees with so-called “hard” skills such as computer literacy, and “soft” skills such as organization, integrity, and leadership. If refugee education does not incorporate hard and soft skill acquisition, then even the limited resources given to refugee education cannot be fully utilized.

Foundations and Structures of Support for King County Refugees

Through my initial research, it became evident that the refugee education system in King County is not reliant on a single organization or office to provide all necessary services. Rather, a web of governmental offices, public services, non-profit organizations, and community-based organizations collaborate to maximize the reach and depth of refugee

education. The governmental structures for refugee support in King County are rooted in the United States Refugee Act of 1980, which created the Office of Refugee Resettlement (ORR). The goal of the 1980 Act was to create a permanent organization to support refugee relocation and assimilation (Refugee Act, 1980). The first section of the Act establishes that part of the role of the ORR is to “provide refugees with the opportunity to acquire sufficient English language training to enable them to become effectively resettled as quickly as possible” (Refugee Act, 1980). Throughout its original document and updated resolutions, the ORR has emphasized the importance of education in refugee resettlement (US Department of Health & Human Services, 2019). The ORR asserts that all states must have formal resources to support refugees, but the state has the freedom to choose the exact structure of these resources (US Department of Health & Human Services, 2019).

In Washington State, the Department of Social and Health Services (DSHS) houses the Office of Immigrant and Refugee Affairs (OIRA) (Washington State Department of Social and Health Services, 2015). Established in 2012, OIRA administers programs to assist in the transition of refugee resettlement. It does this through programs like the Limited English Proficient (LEP) Pathways program (Washington State Department of Social and Health Services, 2015), which works with community colleges and NGOs to provide English training appropriate to the skill levels of the individual (Washington State Office of Immigrant and Refugee Affairs, 2019). If necessary, OIRA covers the cost of these classes (Washington State Office of Immigrant and Refugee Affairs, 2019).

Research Design

The goal of my research was to simulate the methodology of a 2016 report commissioned by Seattle’s Office of Immigrant and Refugee Affairs (OIRA) that explored and assessed the experiences of East Africans in the city of Seattle. The researcher Aileen Balahadia used interviews with community leaders and focus groups to integrate stories and experiences of East Africans with data and background about the communities living in Seattle (Balahadia, 2016). The interview questions were broad, and interviewees were encouraged to direct the conversation to their concerns and points of interest. Only after listening to the needs of the community did she make recommendations to policy makers and the general public (Balahadia, 2016). This approach is favorable because it prioritizes the voices of the people who work within the system and who best understand the community’s needs. In my research, I built background information and worked to understand the structures that support refugee education, but, like the OIRA report, the policy recommendations are reflective of the needs and interests of the organizations that support refugee education.

In the course of my research, I worked with a variety of organizations and offices that either offer refugee education programs or refer refugees to educational opportunities. With IRB approval I interviewed the Annual Giving Officer/ Youth Program Director, as well as the Executive Director of the Refugee Women’s Alliance (ReWA); the Director of Community Programs at Refugee Northwest Seattle; the Adult Literacy Program Manager at Seattle Public Libraries (SPL); and the Volunteer Outreach Coordinator at Literacy Source. I chose my interviewees by reaching out to all organizations in King County that support refugee education and conducting interviews with the representatives who returned my calls and emails. My interviews were conducted either at the locations of the organizations being discussed or over the phone, and they each lasted between 30-45 minutes. I focused on four primary questions: tell me about yourself; tell me about your organization; tell me about the programs and classes your organization provide; and tell me about who uses your resources. Based on the interviewees’ answers to these questions, I also asked follow-up questions (Appendix A).

Research Limitations

Due to time constraints, my research is very specific. I focused on only adult refugees from Somalia, but there is a need for a comprehensive evaluation considering refugee education for refugees of all ages and national origins. My research was also restricted by the COVID-19 pandemic. In particular, the process of trying to gain contact with some organizations was interrupted by the pandemic; I ceased sending follow-up emails and phone calls to organizations beyond the four I interviewed, further limiting the scope of my research. Another limitation to my research is Seattle University’s IRB restrictions concerning interviewing refugees. Ideally, research about adult refugee education would include the thoughts, ideas, and opinions of refugees because it is the goal of my research to determine the best ways to serve refugees. Therefore, future research should incorporate refugee voices.

Analysis of Interviews

Overview of Organizations

The Refugee Women’s Alliance (ReWA) is a local NGO that was founded in 1985 with the goal of assisting refugee women in integrating into their new societies. Today, it has eight locations throughout King County that include childcare centers, a domestic violence center, and an immigration center (Eshetu & Pamm, 2020). They also offer a variety of resources ranging from English for Speakers of Other Languages (ESOL) classes to housing assistance programs (Eshetu & Pamm, 2020). In 2019, they served 2,913 refugee and immigrant people

through their various programs and workshops (Refugee Women's Alliance, 2019). They receive their funding through federal, state, county, city, and private grants, as well as through private contributions (Eshetu & Pamm, 2020).

Refugees Northwest is a refugee resettlement organization run by Lutheran Community Services Northwest, a regional NGO headquartered in Portland, Oregon. Refugee Northwest programs include cross-cultural mental health services, refugee elder programs, immigration assistance, and ESOL classes (Lloyd-Wagner, 2020). Each of their programs is funded through a different source, but some examples of these funding sources are Medicaid and federal, state, and private grants (Lloyd-Wagner, 2020).

The Seattle Public Library (SPL) plays a role in refugee education through ESOL classes, advocacy workshops, speaking groups, and walk-in tutoring at its locations throughout King County. The Adult Literacy Program Manager explains that "the goal of public libraries is that any person can come in with any question, from 'How do I fill out this form?' to 'How can I go to community college?' and receive an answer and any help they need" (Jough, 2020). SPL's adult education programs are funded through the Seattle Public Library Foundation, which is made up of private donors (Jough, 2020).

Founded in 1986, Literacy Source is an NGO that provides educational opportunities to all adult learners, including ESOL, math, digital literacy, and citizenship classes (Socha, 2020). Their Ready to Work program is particularly popular amongst refugee learners (Socha, 2020). Literacy Source is contracted out by SPL, Refugees Northwest, and the city government to provide classes and programs (Socha, 2020).

Impactful Services

The existing secondary literature about refugee education focuses primarily on language acquisition; however, every representative that I talked to stressed the importance of education beyond ESOL. Refugees Northwest's Director of Community Programs, Amy Lloyd-Wagner, explained that refugee education must include the provision of functional and situational education that assists them in navigating real life situations in American culture and society (2020). This study challenged my narrow definition of education as knowledge provided within the four walls of a classroom: in fact, educational programs can include educational workshops, field trips, meetings with case managers, and engagement with local representatives. Each of these must be considered part of refugee education because it is through these programs that refugees learn to apply their language and career classes.

The first programs important to highlight are ESOL classes. ESOL classes were offered at each of the NGOs I interviewed, but ESOL classes are the primary focus of Literacy Source, so my discussion will center on their ESOL programs. Literacy Source offers a variety of ESOL classes, ranging from "no English knowledge" to "advanced reading and writing."

Students attend an orientation where they are tested and interviewed in order to place them in the appropriate level of class (Socha, 2020). Literacy Source's classes are offered in 10-week sections that mirror local universities' quarter systems. Literacy Source also practices student-based learning techniques, meaning that at the beginning of the course, students work together as a class to create goals and learning outcomes and the instructor then builds a curriculum to meet those goals (Socha, 2020). Classes are taught by certified adult educators with the help of volunteer class assistants. Students also have access to walk-in or scheduled tutoring with volunteer tutors as well as access to Literacy Source's library which is organized specifically for ESOL learners (Socha, 2020).

The second program type, hard skills training is a common extension of refugee education. SPL offers classes through Literary Source that combine English as a second language with computer literacy and job skills (Jough, 2020). Resume workshops, offered at every organization that I interviewed, are an example of hard skill development. At the end of these classes or workshops, students come away with a clearer understanding of American work culture and have cultivated skills that employers seek in their employees. Additionally, ReWA offers programs in home-healthcare training and childcare provision. In order to take part in these classes, participants must have passed the first two levels of ESOL classes offered at ReWA. At the completion of these programs, participants earn professional certificates required in the state of Washington (Eshetu & Pamm, 2020). Even for refugees with prior work experience, these certificates are crucial. In a ReWA blog, one woman explains, "I have 40 years of experience teaching, but without credentials it was difficult to get a job" (Walby, 2020). After participating in one of the variety of programs offered by ReWa, students can work at preschools, daycares, or as home care providers (Eshetu & Pamm, 2020).

A third type of refugee education programs involve case managers who work one on one with clients to ensure they successfully gain employment (Lloyd-Wagner, 2020). These case managers assist in several ways: they help refugees navigate King County's job market; they can refer people to programs, classes, and workshops to build the skills they need to enter the workforce; they can assist with resumes and job applications; once a person has been employed, a case manager checks in on the status of employment; finally, if a client needs to find a new job, the case manager can continue to support them (Lloyd-Wagner, 2020). Organizations that use case managers include ReWA, Seattle Public Libraries, and Refugees Northwest. In many cases, it is necessary that that case managers be fluent in the language of the refugees they are working with, and Lloyd-Wagner explained to me the difficulty of finding specialists fluent in African languages like Somali (2020).

The forth critical program category is systems navigation via classes, workshops and other programs. These programs range from using public transportation to understanding

family law. For example, one unit of ReWA is dedicated to people experiencing domestic violence (Eshetu & Pamm, 2020). Refugees Northwest has a program to support refugees with complex medical conditions to navigate doctor visits, prescription refills, insurance, and other aspects of the American healthcare system (Lloyd-Wagner, 2020). Another example of system navigation is parent workshops where parents learn how to communicate with their children's teachers. One of ReWA's youth programs requires that parents take classes so they can understand how to best support their students. ReWA's youth programs director recalls one session of the class where parents took pictures of a sick note so they knew what to write to avoid their children being marked as truant (Eshetu & Pamm, 2020). Perhaps the most important thing to note about these system navigation programs is that, according to Refugee's Northwest and ReWA, they all stem from needs voiced by the refugee community itself (Eshetu & Pamm, 2020; Lloyd-Wagner, 2020). Informing people of the laws that protect them and assisting them to use the resources available to them is an important aspect of refugee education (Eshetu & Pamm, 2020).

The fifth and final critical refugee program type is advocacy. It is through education about their own rights that refugees become able to self-advocate. SPL, ReWA, and Refugees Northwest offer programs to help refugees and immigrants understand the naturalization process, their rights regarding the police and Immigrant and Customs Enforcement (ICE), and their ability to be involved in policy decisions (Eshetu & Pamm, 2020; Jough, 2020; Lloyd-Wagner, 2020). Once a year, ReWA transports clients to Olympia for a meeting with their legislators, before which ReWA helps them develop a plan to express their needs. Recently, the refugee organizations in Seattle have been working together with the United States Census Bureau to encourage all people with refugee and immigrant status to fill out the 2020 census. Through fliers and word of mouth, these organizations are educating refugees about how the 2020 census determines policy surrounding issues like voting, welfare, infrastructure, and education (Eshetu & Pamm, 2020, Jough, 2020; Lloyd-Wagner, 2020; Socha, 2020).

The Imperfect Web: Analysis of Organizational Cooperation

In the absence of robust governmental support, organizations in King County have had to establish both informal and formal service networks. This system of partnerships creates a system of refugee educational services that is far from ideal, but could be improved with greater funding from King County. Some partnerships are short term, such as ReWA working with Refugees Northwest to offer a mental health workshop (Lloyd-Wagner, 2020). Other partnerships are more enduring, such as SPL and Literacy Source's ESOL classes (Jough, 2020). Another way that refugee organizations work together is through coalitions, such as Northwest Immigrant and Refugee Health Coalition or the Eastside Immigrant and Refugee

Coalition. In joining a coalition, organizations commit to its goals; coalitions meet regularly to determine each organization's role in achieving those goals (Eshetu & Pamm, 2020).

ESOL classes exemplify how these informal networks operate and the variety of services they offer. While the quarter-long ESOL classes offered by Literacy Source and ReWA pride themselves on student engagement in community building with learning, consistent attendance is necessary to succeed in their programs (Eshetu & Pamm, 2020; Socha, 2020). To accommodate the need of students who are unable to commit to weekly classes, Refugees Northwest and SPL offer drop-in tutoring and classes where anyone can stop in at any time (Jough, 2020; Lloyd-Wagner, 2020). With the number of organizations and the variety of classes offered, the hope is that every refugee learner can find an option that works for their language goals and schedule.

These informal coalitions offer services that meet the needs of refugees, but imperfectly. For example, OIRA does not have the resources to provide refugee education, so they fund education ventures through various other organizations, like ReWA, Refugees Northwest, and Literacy Source (Eshetu & Pamm, 2020; Lloyd-Wagner, 2020; Socha, 2020). Refugees Northwest does not provide ESOL classes, so they rely on Literacy Source for English language acquisition (Lloyd-Wagner, 2020); but Literacy Source does not provide childcare, so they use ReWA for those services (Jough, 2020). Further, ReWA aids domestic violence survivors (Eshetu & Pamm, 2020), while Refugees Northwest provides mental healthcare assistance and education programs (Lloyd-Wagner, 2020). Therefore, if a refugee needed all of the aforementioned services—ESOL, childcare, domestic abuse assistance, and mental healthcare—they would need to go to three or four different organizations. Furthermore, these numerous organizations are spread throughout the greater Seattle area from SeaTac to North Seattle. The fact that these services are diffused around King County helps mitigate some transportation barriers to education, but not all services are offered at each location. Due to the restrictions of COVID-19, several refugee organizations have moved their programs online (Literacy Source, 2020; Refugees Northwest, 2020; Walby, 2020). While access to the internet might be a barrier to some refugees attending classes, continuing to host some trainings in a hybrid or fully-online format in the future would mitigate the transportation barriers some refugees faced prior to COVID-19.

This web of offices and organizations attempts to serve all refugees in King County; however, evidence reveals that many of the clients are still unable to access the resources they require. The organizations hope that if one program or service is not accessible, another organization will be able to offer the support they need. Despite collaboration among these groups, the system can be difficult to navigate. I was fortunate to have the time and resources needed to understand all of the refugee programs offered, but many clients are unable to generate the time, resources, and ability to navigate each organization's website to determine

which program would be most beneficial for their needs. In addition to the creation of a concise database of resources in key languages—including Somali—educational programs such as workshops are needed to help refugees learn about the educational system itself.

Addressing Limitations of Education Services

There are many holes in the web that prevent organizational efforts from being completely successful in providing educational services to refugees. One of these shortfalls concerns refugees who come to the US with degrees or professional certificates. While local organizations support refugees in their job search through case management and career workshops, there are no established programs that support refugees seeking American certification or degrees in fields they have previously studied. My research found that there is an imbalance in the resources allocated to preparing refugees for service sector jobs and the resources allocated to re-education and recertification. These services might be available at local community colleges, but as a whole, King County organizations do not provide these imperative services.

Another recurring challenge that organizations emphasized was understaffing. In order to offer the diverse programs that improve educational access for refugees, organizations must employ a multilingual staff of highly educated people, and this is not feasible with King County's current funding shortfalls (Eshetu & Pamm, 2020; Lloyd-Wagner, 2020; Socha, 2020). In order to make a livable wage in King County, employees of local NGOs must do the jobs of several people (Eshetu & Pamm, 2020). This affects their ability to serve all the clients who seek their services; for example, if someone is split between three roles, then they are unable to put their full energy into any role. To simplify, the employees of local NGOs are overworked and underpaid, resulting in a high turnover rate in local NGOs and offices that support refugees (Eshetu & Pamm, 2020; Lloyd-Wagner, 2020). It is not a lack of care for the cause that pushes people from these jobs, but rather an inability to support themselves and their families on the salaries they receive. Like the refugees they serve, employees are limited by time, and they must make difficult decisions regarding how they spend that time. Mahnaz Eshetu of ReWA explained that grants do not move with inflation, so each year their organization is expected to offer more services with fewer resources. She values her employees and wishes that she could offer them a more competitive wage, stating that "I think many people forget that these people are educated professionals, and the fact that they often cannot earn a livable wage is frustrating" (Eshetu & Pamm, 2020).

There are some obstacles to refugee education that, despite their best efforts, organizations can only mitigate and not eradicate. Every organization identified time as one of the most significant barriers refugees face in gaining an education (Eshetu & Pamm, 2020,

Jough, 2020; Lloyd-Wagner, 2020; Socha, 2020). There is a saying that “we all have the same 24 hours in a day.” However, this is not true for people who work several jobs to provide for their family, must care for their children, or have to travel long distances to attend classes. For many, 24 hours is not enough time to accomplish all that they may desire—including an education. There is an added pressure of time created by the limitations of financial support that refugees receive. When refugees come to Seattle, they receive financial support from the federal government for three months, at the end of which they are expected to be fully acclimated into their new society and gainfully employed (Eshetu & Pamm, 2020; Lloyd-Wagner, 2020). Because of the high cost of living in King County, many refugees must work two or three full time jobs in order to support themselves and their families, leaving no time to study or take classes (Lloyd-Wagner, 2020). Refugees cannot be expected to prioritize education when they are struggling to make a living. If a refugee is not working several jobs, they may be the primary childcare provider in their household. Therefore, the absence of childcare services makes the classes offered by local organizations inaccessible. Yet another way that time constrains refugee education is transportation to and the location of educational services. If a program or class is too far away via public transport or walking, refugees are unlikely to commit to the program or class. Time was a theme throughout my research; every interviewee I spoke with reinforced the obstacle that the lack of available time creates for adult refugees.

Proposed Solutions

The solutions proposed by this research are centered around state, county, and city policies. Other possible solutions could be centered around NGO organizational structure or budget allocation, and more potential solutions could include institutions of public education. I focused on public policy as the most direct way to advocate for the people and organizations who work tirelessly to provide educational opportunities for adult refugees. I searched for an innovative solution to the challenges that refugees face when seeking an education, however, as I pursued this research, it became apparent that the most impactful action that local governments can take is to increase their financial support to refugees and the organizations that serve them. As previously noted, King County and the Seattle Foundation allocated \$2.25 million in 2017 for refugee resettlement efforts (King County, 2017). While this refugee fund was beneficial, it is insufficient considering the depth of the services that refugee resettlement requires. Furthermore, increased financial support for refugee communities is beneficial to wider King County, as acknowledged in “Advancing Equity and Opportunity for King County Immigrants and Refugees: A Report from the King County”:

It is also important to acknowledge the critical role immigrants and refugees play in building vibrant communities all around King County. Immigrants and refugees make

significant contributions at every social and economic stratum in the County from CEOs of Fortune 500 companies, to academic leaders, doctors, lawyers, and small business leaders. (2016, pg. 6)

I propose that state, county, and city governments support refugee education by offering financial assistance to refugees beyond the first three months of settlement and by providing more financial support to organizations in the form of grants.

The unfortunate reality is that no bill or act of law can give Somali refugees more time in a day. However, by extending the period of government financial support to refugees beyond three months, local governments will alleviate some of the pressure put on refugees to become fully independent members of the workforce. Right now, many people are forced to choose between working two jobs to support their family and working one job while pursuing an education. One choice limits options for upwards mobility but provides sufficient income for refugees and their families, while the other choice secures higher future earnings but does not provide a livable income. The reality is that there is no real choice here; people must do whatever it takes to maintain their livelihoods, including stalling their education. However, if refugees have a longer period to adjust to life in King County, they are more likely to seek educational opportunities. The provision of adequate resources can help generate an increase in productivity and leisure time that forms a much-needed work-life balance. Mitigating some of these significant barriers to refugee education could help create a more balanced social and cultural framework for Somalian refugees in Washington state, King County, and the city of Seattle.

The other way that local governments can support refugee education is by increasing financial support to the organizations that serve refugees. Additionally, grants should move with inflation or be reevaluated on a yearly basis to account for inflation. Principally, these organizations need funding in order to expand their services so they can meet the needs of all King County refugees. My research indicated that what works for refugee education is a variety of class times and locations, access to childcare, and programs in addition to existing ESOL classes. Further, educational opportunities for adult refugees must be curated in many different fields of study or areas of skill. However, providing a more holistic approach to education requires funding to rent out new spaces, to hire more educators and specialists, and to purchase learning materials. Classes, workshops, fieldtrips, and other programs are not free, and in order to provide the depth of education that refugees need, organizations require more funding from state, county, and city governments. In addition to more programming opportunities, increased funding allows organizations to pay their employees a livable wage. Having an educated, multilingual staff of educators, case workers, program directors, and other professionals is essential to ensuring culturally aware and trauma informed education for adult refugees, and this necessitates an income that permits employees to live in a high-cost

area and to support themselves and their families. Further, a higher wage will result in lower turnover and more efficient operations. Refugee organizations in Seattle have proven their strength as they work together to provide a variety of opportunities for refugees to participate in education, but additional funding will ensure that more Somali refugees have access to essential programs and resources.

Conclusion

First and foremost, Somali refugees are people with families and jobs and lives that they left behind in search of safety and stability. They have faced intense trauma and loss, and they have persevered through years of uncertainty to arrive at SEATAC airport. They deserve to be greeted with respect and compassion when they finally settle in King County. These people should be given the tools to navigate their new community, they should be empowered to be independent self-advocates, and they should feel at home in King County. Educational opportunities are the key to incorporating Somali refugees into the community. In order to tangibly increase access to educational opportunities, local and federal governments must provide more funding towards resettlement efforts. Somali newcomers need the prolonged stability that living stipends supply, and the organizations who work relentlessly to provide necessary services to refugees require financial support to create a variety of culturally aware and trauma informed educational services. For the Somali people who are new to King County, these resources are vital. With educational access, they are able to acclimate and flourish in their new home, making the communities in which they live all the more vibrant.

References

Advancing equity and opportunity for King County immigrants and refugees: A report from the King County Immigrant and Refugee Task Force. (2016). https://www.kingcounty.gov/~media/Council/documents/Issues/IRTF/IRTF_July1.ashx?la=en.

Balahadia, A. (2016). *Voices of Seattle's East African communities: An overview of community issues and opportunities*. City of Seattle Office of Immigrant and Refugee Affairs.

Beista, G. (2015). *Educational philosophy*. London; New York: Routledge.

Benseman, J. (2014). Adult refugee learners with limited literacy: Needs and effective responses. *Refuge*, 30(1), 93.

Düvell, F., Molodikova, I., & Collyer, M. (Eds.). (2014). *Transit migration in Europe*. Amsterdam: Amsterdam University Press. doi:10.2307/j.ctt12877m5.

Eshetu, M.K. & Pamm, S. (2020, Feb 19). Personal interview with the Executive Director and the Annual Giving Officer/Youth Program Director at the Refugee Women's Alliance.

Ferriss, S. S., & Forrest-Bank, S. S. (2018). Perspectives of Somali refugees on post-traumatic growth after resettlement. *Journal of Refugee Studies*, 31(4), 626-646. doi:10.1093/jrs/fey006.

Hightower, K. (2019, Nov 14). Seattle Mayor Durkan to the Trump administration: We will continue to welcome refugees in the city of Seattle. <https://durkan.seattle.gov/2019/11/mayor-durkan-to-the-trump-administration-we-will-continue-to-welcome-refugees-in-the-city-of-seattle/>.

Imad, M. (2020). *Trauma informed teaching & learning (for teachers)*. Personal Collection of Mays Imad, Pima Community College, Tucson AZ.

Jough, M. (2020 Jan 15). Personal interview with Adult Literacy Program Manager at Seattle Public Libraries.

Khamphakdy-Brown, S., Jones, L. N., Nilsson, J. E., Russell, E. B., & Klevens, C. L. (2006). The empowerment program: An application of an outreach program for refugee and immigrant women. *Journal of Mental Health Counseling*, 28(1), 38-47. doi:10.17744/mehc.28.1.fmc2j3jw5xx1cvbf.

King County. (2017, Aug 28). *King County, City of Seattle and Seattle Foundation Announce \$2.25 Million in Emergency Funding to Provide Critical Services to Immigrants and Refugees*. <https://www.kingcounty.gov/elected/executive/constantine/news/release/2017/August/28-immigrant-refugee-funds.aspx>.

Lansford, Tom. (2019a). *Political handbook of the world 2018-2019* (1st ed.). US: Cq Press. Retrieved from [https://ebookcentral.proquest.com/lib/\[SITE_ID\]/detail.action?docID=5791040](https://ebookcentral.proquest.com/lib/[SITE_ID]/detail.action?docID=5791040).

Lipka, S. (2006). Unsettled in America. *The Chronicle of Higher Education*, 52(49), A.32-A.34.

Literacy Source. (2020). *Literacy Source Homepage*. <https://www.literacysource.org/>.

Lloyd-Wagner, A. (2020, Feb 26). Personal interview with the Director of Community Programs at Refugees Northwest.

McBrien, J. L. (2005). Educational needs and barriers for refugee students in the United States. *Review of Educational Research*, 75(3), 329-364. doi:10.3102/00346543075003329.

Perruchoud, R., & Redpath-Cross, J. (2011). *Glossary on migration* (2nd ed.). Geneva, Switzerland: International Organization for Migration.

Refugee Act of 1980, Pub.L. 96-212. (1980). <https://www.acf.hhs.gov/orr/policy-guidance/refugee-act>.

Refugees Northwest. (2020). *News and Alerts*. <https://refugeesnw.org/news-and-alerts/>.

Refugee Women's Alliance (2019). *ReWA Annual Report 2019*. https://www.rewa.org/wp-content/uploads/2020/08/ReWA-2019-Annual-Report_digital.pdf.

Riley, K. (2015, Apr 24). Washington's refugee experience, then and now. *Seattle Times*. <https://www.seattletimes.com/opinion/washingtons-refugee-experience-then-and-now/>.

Socha, C. (2020, Feb 27). Personal interview with the Volunteer Program Manager at Literacy Source.

Stepping up: Refugee Education in Crisis. (2018). United Nations High Commissioner for Refugees.

UN General Assembly. (1951, Jul 28) *Convention Relating to the Status of Refugees*. United Nations, Treaty Series. Vol. 189. <https://www.refworld.org/docid/3be01b964.html>.

US Department of Health & Human Services. (2019). Office of Refugee Resettlement: About: What we do. <https://www.acf.hhs.gov/orr/about>.

Walby, J. (2020, Mar 2). Blogs: Preschool teacher training. Refugee Women's Alliance. <https://www.rewa.org/bridging-the-gap-to-higher-education/>.

---. (2020, Jun 11). ESL online: Bridging the digital divide. Refugee Women's Alliance <https://www.rewa.org/esl-online-bridging-the-digital-divide/>.

Washington State Department of Social and Health Services. (2015, Aug 27). *Washington state plan for refugee assistance*.

Washington State Office of Refugee and Immigrant Assistance. (2019) *ESA Briefing Book*.

Winchester, I.. (2016). Syrian refugees and their education in Canada. *The Journal of Educational Thought*, 49(1) doi:10.20355/jcie29369.

Zolberg A. R., & Benda, P.. (2001). *Global migrants, global refugees* (1st ed.). United States: Berghahn Books. Retrieved from

<http://portal.igpublish.com/iglibrary/search/BERGHAHNB0000209.html>

Queerer than Canon: Fix-it Fanfiction and Queer Readings

Neha Hazra, Psychology and Philosophy

Faculty Mentor: Natalie Cisneros, PhD, Philosophy

Faculty Content Editor: Molly Clark Hillard, PhD, English

Student Editor, Cole Jansson, English

Abstract

This essay examines queer fanfiction, or fiction based on previous narratives, through the lens of Eve Kosofsky Sedgwick's theory of "reparative readings" to argue that fanfiction is the instantiation of "loving criticism," and of grassroots queer praxis. I explain fanfiction and its common constructs, and then explore how queer reading functions to challenge and subvert heteronormative narratives for better representation and for validation. Fanfiction provides space for healing and pleasure, and delegitimizes heteronormative ideals, giving space for queer readers to grow and learn about themselves. This essay highlights fanfiction about Steve Rogers and Bucky Barnes from the Marvel Cinematic Universe as a case study of fanfiction as a Kosofskian reparative reading. In this example, fanfiction works to give voice to the sublimated themes that lie beneath more overtly heteronormative messages, and brings queer identity to the forefront of these stories. With the Marvel Cinematic Universe's connections to hegemonic and capitalist forces, these messages can be buried beneath commercial values: fanfiction repairs this damage, I argue. Fanfiction not only gives space for different sexual identities, but also provides representation for different physical abilities, racial identities, and gender identities. In consuming fanfiction, readers may undo the harmful ideals not only within the narrative, but within their own psyches, which empowers them for future queer activism, or praxis.

Introduction

The whole point of fanfiction is that you get to play inside somebody else's universe. Rewrite the rules. Or bend them. The story doesn't have to end [...] You can stay in this world, this world you love, as long as you want, as long as you can keep thinking of new stories. (Rowell 123-124)

In this discussion, I will focus on the subgenre of literature and media consumption known as fanfiction (fanfic); I will specifically focus on spaces that fanfiction creates for readers to revel in their preferred narratives while having the creative liberty to critique potentially problematic aspects of a narrative. Drawing from queer theory, philosophy, and literary studies disciplines, I will create an interdisciplinary reading of selected fanfics. In doing so, I will show that these works provide readers safe spaces for healing and an accessible bridge into queer praxis for those who may not have been exposed to an in-depth study of theory. I will draw from Eve Kosofsky Sedgwick's examination of queer readings and what they can do for readers: specifically, Sedgwick's concept of "reparative reading" ("Paranoid Reading 128). Sedgwick argues that reparative readings enable readers to gain some positive effect from a text without first expecting disappointment and pain from the contents. While Sedgwick examined the classic literary canon including Shakespeare and Dickens in her queer readings, fanfiction is a genre that has not been fully accepted or examined by academia. In my analysis of fanfiction as a form of queer praxis, I mean to demonstrate that fanfiction is a legitimate genre deserving of academic examination, for it exists as a site of personal and intellectual engagement with narratives and societies surrounding the self. To examine the effects of reparative readings, we will consider one specific case study: Steve Rogers and James Buchanan "Bucky" Barnes¹ from the Marvel Cinematic Universe. I've chosen this example both because of the sheer number of readers and writers that engage with this relationship and because of my own engagement with this subject. Steve and Bucky's relationship is a common subject of a popular fanfiction subgenre called "fix-it fics" in which readers are able to nuance relationships that the original narrative does not adequately examine. The question, then, concerns what fanfiction can contribute to queer theory and praxis. This essay will argue that fix-it fics function as reparative readings, giving readers a greater possibility of affective engagement with a narrative by recognizing and revealing queer subthemes that heteronormative² regulations conceal from the reader in the dominant narrative. These fix-it fics then become a form of grassroots queer praxis on the individual level: a more accessible form of political resistance rooted in the reader rather than in an external agenda.

As a new generation of readers and viewers desiring to critically engage with a text

rises, fanfictions function as a response to or reclamation of an original text through which fanfic authors purposefully add onto or change parts of an existing narrative for their (and other readers') satisfaction.³ The original narrative, referred to as "canon," is the original published work a fanfic is based upon.⁴ Traditionally, canon refers to explicit details or events in a narrative as they are written or directed by the original creator (DopeyPixie). "Headcanon" refers to a reader's interpretation of the canon, including ideas regarding character development, backstories, and relationships. Often, audiences create headcanons to expound on subtext and implicit themes in a narrative or to specifically contradict an aspect of canon that they find inappropriate or unenjoyable ("Headcanon"). Often, headcanons pertain to nuanced aspects of characters that the canon withheld or glossed over. "Slash fanfiction" is a genre that frequently uses headcanons, and these fanfics specifically cast canon characters together in homosexual or homoromantic relationships ("Slash"). The goal of slash fanfics, stated or not, is to parse out and explicitly show implicit connections between two or more characters. Slash writers receive criticism for writing characters that deviate from the explicit canon; however, this critique relies on a stability in the canon narrative that may not exist, as human experience (lived or written) and its subjectivity is arguably unstable (Young 129). Slash is often a response to the original creator's engagement in queerbaiting, defined as the exploitation of queer audiences' financial support and emotional investment through hints of unfulfilled queer representation (Romano). Creators who queerbait often try to use subtext as a defense in the face of critics or unsatisfied audiences, as if implying that queer representation is enough to satisfy their audience's needs. Fix-it fics address issues like queerbaiting by purposefully adapting and rewriting canon to fulfil the new writer's desires for the canon characters and narratives. These fanfics create a platform for readers to challenge problematic themes in dominant media and represent authentic queer identities. Fix-it fics function as a form of accessible queer readings that encourage readers to recognize and deconstruct heteronormativity in dominant media.

Sedgwick and Reparative Readings

Queer readings, those which "queer"⁵ a text, challenge themes of heteronormativity and other dominant ideals by revealing locations within the text (and making space for such places) that blur the lines between heterosexual and queer presentations of identity. Like fanfics, queer readings seek to explore implicit narratives rather than explicit ones. Queer readings "make the invisible possibilities and desires visible" as an explicit narrative that may not resemble the original ("Queer and Now" 3). Whatever implied queer representation original authors claim in their texts, queer readings work to force aside existing structures to make space for explicit queer representation, leaving no question as to what is happening

and for whom. In this process of creating space for queer representation, queer readings also create space for more nuanced treatments of “human subjectivity” and “human relationality” (Young 127), revealing subjectivity and intimacy that is not exclusive to heteronormative conceptions of people or relationships. Along with reworking a narrative to include queer representation, queer readings confront the creators of such works for exclusively adhering to dominant heteronormative constructs that support a stable and bound depiction of identity. Queer readings also confront the creators of such work and expose their heteronormative foundations, forcing these creators to face the “substantive inaccuracy and moral inadequacy” of their normative structures (Young 127). The exclusion of queer experiences by wealthy media corporations or powerful creators is purposeful in supporting a hegemonic, heteronormative ideal that endorses a particular image of who or what a person may be. The goal of queering is not simply to do away with these constructs but to “[render these] culturally central, apparently monolithic constructions newly accessible to analysis and interrogation” (“Queer and Now,” 9). From Sedgwick’s perspective, we can see that queer readings expose heteronormative constructs for supporting a supposedly ideal representation while creating a discourse on the accuracy of these constructs in human experience. This discourse contributes greatly to an understanding of accessible queer praxis as readers of these narratives are able to explore nuances of queer experience while “knowing that they are unstable all the while” (Young 127), all without the help of an entire academic course in queer theory. In calling these readings unstable, we mean that queering proposes a complex and subjective interpretation of queer experience and not a new hegemonic narrative. Since stability inherently purports an identity as more lasting and permanent than others, we can see that queer readings fundamentally challenge notions of stable identity.

Sedgwick proposes two kinds of queer readings that differ in the location, intentions, and affect of the reader: paranoid readings and reparative readings. In reference to what Melanie Klein calls the “paranoid-schizoid position,” which seeks to split objects into valid and invalid categories, Sedgwick initially uses the term “paranoid reading” to refer to the position of “terrible alertness” that skeptically examines a narrative through its parts (“Paranoid Reading” 128). Readers who take a paranoid approach to a narrative position themselves at a “critical distance” as a way of maintaining control of the narrative (Love 236). By distancing themselves from the text, readers can disentangle specifically “valid” aspects of a narrative from their original contexts and reinscribe them into their own arguments. From this external position, additionally, readers may obtain a full view of the entire narrative to eliminate any chance of surprise. The distant and skeptical position of this type of reading, however, does not obviously lend itself to a deep affective engagement that we (and later Sedgwick) now prioritize with the text, as this level of skepticism and critical distance can initially close a reader off from accepting what a narrative can provide. Sedgwick argues that the paranoid

position “demands least from its object,” or seeks less to engage with the text in a reciprocal relationship but instead to take from the narrative (“Paranoid Reading” 132). Later, Sedgwick criticizes this paranoid position for being too stringent, as this position still lends only “a way among other ways, of seeking, finding, and organizing knowledge” (“Paranoid Reading,” 130). The paranoid position, however, stabilizes these separate epistemologies without addressing that these are also an interpretation.

Reparative readings, on the other hand, place the reader intentionally within the narrative to understand each narrative in full. From Klein’s same discussion of the paranoid position, Sedgwick draws on her conception of a “depressive position” that reforms and combines the split parts of a paranoid position to understand the object as “something like a whole [...] not necessarily like any preexisting whole” (“Paranoid Reading” 128). The intention of the reparative position is not to excise aspects of a narrative and reconfigure them to fit another story but to reattach every detached aspect into something cohesive (this may even be more cohesive than whatever the original author intended). From a reparative position, there cannot be any critical distance or a refusal to be surprised because, according to Sedgwick, this position inherently supports spontaneous “experimentation and pleasure” from the narrative: both of which require a relinquishing of control and an allowance for surprises (Love 236). With a reparative approach, the reader acknowledges that the constructs creating the narrative inherently provide limitations for representation and affect while simultaneously engaging with the text to create future resources of developmentally important models of interpersonal engagement. (“Paranoid Reading” 149). Within queer theory and readings on queerness, the reparative position understands that these narratives were created with a heteronormative guide and empowers aspects of the story that feature or can become better models for queer readers. In sum, readers employing a reparative reading can affectively engage with the text while understanding that the text’s origins are inherently flawed—it is in this recognition of flaw that understanding and healing can happen.

Queer Praxis: A Case Study in “Stucky”

Fix-it fics function as reparative readings by challenging typical mainstream narratives for their exclusion of queer identities and their alienation of queer audiences from potential pleasure. Within canon, characters and plots are intentionally positioned to suit the author’s interests and serve the overall story line; however, this stabilizes characters and events as fixed entities. Much of canon tends to reinforce and support primarily heteronormative identities, especially canon narratives that come from multi-million-dollar production companies whose goals focus around profits.⁶ Often, these productions will exclude positive

queer representations under the excuse of being “family-friendly”—although this in itself problematically reinforces heteronormative constructs that condemn queer identities as perverse.⁷ In the face of blatant queer-exclusion, it can be hard for queer audiences to find comfort and pleasure in a narrative without internalizing the missing representation of queer identity. Hope, then, is one of the strongest motives of fanfiction writing—specifically fix-it fic writing—because hope helps readers “organize the fragments and part-objects [they] encounter or create” (Sedgwick, “Introduction” 112). Canon, like some paranoid readings, can cobble together characters and events to play into familiar constructs, but fix-it fics recreate the narrative to better align with already present subtext. In fix-it fics, no world or character is a fixed entity, and there is more possibility for what can happen or what characters can do (Reißmann et al. 19). By changing aspects of these narratives to support queer identities, I argue that fix-it fic writers critique canon narratives while also deeply experiencing and reveling in the narrative’s world, characters, and intricacies.

Those who write fix-it fics imbue harmful or problematic texts with loving corrections that help repair connections between the reader and the original narrative. These writers see fix-it fics and fanfiction in general as a “way to save a beloved text”⁸ from what we infer to be heteronormative constraints that limit the content and influence of a text (Reißmann et al. 19). In the case of pop-culture narratives (i.e. the Harry Potter universe, Marvel’s *Avengers*, etc.), readers may hold onto narratives for being a dominant influence in their development or for providing a sense of wonder that they are not willing to let go of. When the problematic constructs of these narratives are revealed, I argue that fanfics become a way for readers to safely and intentionally engage with the characters and events without perpetuating harmful constraints: “[w]e needed for there to be sites where the meanings didn’t line up tidily with each other, and we learned to invest those sites with fascination and love” (“Queer and Now” 3). When original narratives exclude queer representations, the queer reader has more difficulty positioning themselves within specific aspects of the narrative as it fundamentally lacks empathetic and relatable queer models. Fix-it fics, then, “insert [these] mirrors into the popular texts from which they have been erased,” which allows for a stronger engagement with positive themes within the text (“Fanfiction” 48). In this way, fix-it fics allow readers to heal from the invalidation provided by negative portrayals that draw from heteronormative limitations—sometimes by creating totally new portrayals.

To examine the impact of fix-it fics on readers, we will examine a specific case that shows how fics serve as bridges for readers to cathartic representations. Within the Marvel Cinematic Universe, the relationship between Steve Rogers (a main hero) and his best friend James Buchanan “Bucky” Barnes was continuously ambiguated and filled with implied non-heteronormative connections until, suddenly, the creators of this narrative made Steve Rogers pine over his (female) first love, and ultimately leave his best friend to be with her.

Readers of this narrative were deeply hurt by this sudden change in character, considering the continuous subtext surrounding this relationship, and believed this change occurred because of the creators' and production company's institutional heteronormativity. Fix-it fics become a reparative practice of "negotiating the 'painful gaps' left" in the narrative between "the reader's 'felt desires'" and "read text" (Willis 155 in Duggan 49). I mean to argue that fix-it fics within this universe help readers visualize and internalize a positively queer ending that does not encourage forsaking queer relationships in favor of heteronormative ideals. Although writers of fanfiction make subtext explicit and pull aspects of the narrative into the forefront, I argue that fanfiction does not function from a paranoid position to individualize these subtexts but to reincorporate them with the original narrative. Fix-it fics are a reparative reading of canon that gives readers the ability to engage with their own identities within a text and incorporate positive queer portrayals into their own identity while understanding the original narrative's faults.

By combining this social commentary and loving engagement, fix-it fics and fanfiction combine Sedgwick's notion of reparative readings and what Sharon Doetsch-Kidder calls "loving criticism" to right the written and emotional wrongs in canon narratives. For Doetsch-Kidder, loving criticism is a form of social engagement which seeks to honor the roots of a narrative, rather than forsaking it altogether, together with taking positive action for change (Doetsch-Kidder 446). One of the primary tenets of writing a fix-it fic is making the story "believable" by honoring the canon subtext when morphing events. In this way, fix-it fics inherently try to respect the canon narrative and appreciate the creations of the original writer rather than flippantly ignoring them. One of the most important aspects of loving criticism and fix-it fic writing is a reader's recognition of their own power and ability to dismantle oppressive constructs (Doetsch-Kidder 446). In the very act of writing fix-it fics, the writer understands their own role in absorbing and interpreting the material in front of them in order to see that this is not all the narrative has to be: "[e]mpowerment is the work of discovering one's erotic power, a power that enables creativity and movement" (Doetsch-Kidder 457). Rather than being skeptical of the narrative and blaming it for exclusivity, fix-it fics take responsibility for creating these representations so readers can move forward in the narrative. By accepting this ability to change, fix-it fic writers resist the "violent forms of subjectivity that binary structures demand" which characterize the canon (Hawthorne 156). Slash fics, gender-bending, race-bending, and what I would call ability-bending⁹ all circumnavigate the heteronormative binaries spotlighted within typically able-bodied, straight white characters. In the case of Steve Rogers, fic writers often write this character as hard of hearing or deaf because this character started his arc as a partially deaf man with a very frail body (before being conveniently transformed into a stereotypically sexy able-bodied hero). Many fix-it fics also focus on Bucky's prosthetic arm, and specifically the navigation of intimacy with a

prosthetic arm between previously able-bodied individuals. In fix-it fics, writers can identify places in the canon controlled by heteronormative expectations and explicitly contradict them as a form of reparative, positive change by including what the canon does not.

In many fix-it fics regarding the events of *Avengers: Endgame* and Steve and Bucky's ending,¹⁰ writers consistently include certain details that work to create a healing ending for queer audiences that explicitly represent queer identities. One of the main issues people take with the canon ending of Steve and Bucky's relationship is the sense that their actions are wholly out of character, considering the events of the previous movies and the progression of their relationship within these. In the canon scene, Steve travels back in time to return a tool the Avengers needed for a major battle while leaving Bucky and two of their friends to wait. However, he does not return when he is supposed to and the group finds a much older Steve waiting for them, who then only speaks to one of the friends and does not interact with Bucky at all. One writer, Storynerd on Archives of Our Own, in their fix-it fic titled "darling I keep falling for you," rewrites the scene in this way:

"But...you're here." That's the bit he's stuck on. "You had a life to get to. All the things you missed. But you're here."

Steve sighs, and takes Bucky's hand from his face to squeeze tight between his own. "I wasn't kidding about trying to get a real life. But the past...it's all done. I can't keep looking backwards. I told everyone to move on for five years. What kind of a hypocrite would it make me if I hadn't done the same thing? And Peggy...she had a life without me too. A husband, kids. I couldn't take that from her just because I wanted it too. Besides—" he cuts himself off.

"Besides what?" Bucky asks, looking at where their fingers tangle together. On impulse, he brings his left hand up to join his grip.

"I couldn't leave you," Steve says, quieter now. "I lost you too many times already, Buck. Gave up everything to find you again, too. More than once. You really think I'd do all that and then just walk away?"

Maybe this is what vertigo feels like, Bucky thinks distantly, like the world is spinning a touch too fast. "Steve..." he says, and thank god, thank god Steve knows him so well, because he reads exactly what Bucky means when he can't even put it into words, leans forwards, and kisses him (Storynerd).

This fic changes the events by having Steve not only return at the age that he left but also spend the majority of this scene conversing with Bucky. While recognizing the opportunity Steve had for an alternative ending, Storynerd's Steve explains how that course of action would be unfair not only to Bucky but also to Peggy, his first love. In rewriting the scene

in this way, Storynerd engages in reparative and loving criticism as they work to give the characters an ending that respects the integrity of the work up until that point. Steve calls on the fact that he “gave up everything to find [Bucky] again,” something he has done more than once, and alludes to the events of the past two movies centering around Steve’s character.¹¹ Rather than disregard the events leading up to this moment, I argue that this writer explicitly brings up these events to give respectful weight to the connections built up in these moments. For readers of Steve and Bucky’s relationship, the constant search and longing for each other of these two characters feels romantically charged; so much so that an ending as emotionally detached and amicable as the canon’s jars the audience. Readers of Steve and Bucky’s relationship read into this subtext, and it is here that they find validation for their own identities. Writers like Storynerd make this subtext explicit by doing away with the canon’s coldness, in turn further validating readers’ identities. In this way, this rewritten ending almost seems more believable than the canon when taking into account the entire arcs of the characters.

In this lengthy interaction, fix-it fic writers give back to Steve and Bucky in these final moments, working to heal readers from the harmful canon by bringing up not only canon past events but imagined shared history that deepens their connection. In keeping the details of the history of Steve and Bucky’s relationship vague, the canon creators have more liberty to claim plausible deniability when it comes to the men’s relationship, and this dismissal tends to be especially harmful to readers who find value in the love between these men. Fix-it fics often add details about their shared past, like writer TheLadyConstellation in their fic titled “Our Dance” on Archive of Our Own:

“Wait,” Steve said. “I made an extra stop when I was returning the stones.” Bucky gave a look of confusion because he was, well, confused. Steve reached into his pocket and pulled something out that Bucky hadn’t seen for a very long time.

“1942, just after I got the serum. I went to our apartment. You left them behind just in case I needed something to sell. I never did, but they were left behind.” Steve held the tiny silver rings in front of them.

“I remember when I proposed to you,” Bucky said, laughing. “Of course we couldn’t actually get married, but we had a quiet ceremony in our living room. We even wrote vows.” He laughed again (TheLadyConstellation).

In this fic, Steve and Bucky’s fleshed-out history allows more room for stepping outside the confines of the canon narrative and into a space where queer audiences can find productive and realistic representations. Canon creators often throw in details about characters being queer without giving any explicit examples of these characters living happy, queer lives. This

fix-it fic makes explicit these potential happy lives to show that queer people can have happy moments, and they can have moments (like proposals and exchanging of rings) traditionally ascribed to heterosexual couples in mainstream media. Steve and Bucky exchanging rings before the events of the first “Captain America” movie is important in this fic because it helps connect the characters’ ending to their beginning, allowing their character development to come full circle as well: as Steve and Bucky canonically say, they are with each other “to the end of the line.”

Steve and Bucky (known in fanfic as “Stucky”) fix-it fics show not only that queer characters can have happy endings but also that they can have happy endings that explicitly heal past harms. A writer named Kasia (better known as @captainjanegay on Tumblr) writes a different Stucky fic with added details about Steve and Bucky’s past that portrays negative experiences of queer existence:

Steve only chuckles wetly and squeezes Bucky’s hand tighter in his. “You punk. I can still take you back to London. I can take you wherever you want. But we can do this now, Buck. We can do this like we always wanted,” Steve whispers, resting his forehead against Bucky’s. “Do you still want it? Do you still want me?”

“Til the end of the line,” Bucky says simply as he wraps his free hand around the back of Steve’s neck, keeping him close. “There’s nothing that could change that.”

Steve’s smile is blinding as he tries to press a kiss to Bucky’s lips. “I’m yours and yours alone,” he says and kisses Bucky again. “And you’re mine” (Captainjaygay).

This example specifically names a habitual exchange between the two characters. It is important to note that this line originates in the canon: “I’m with you til the end of the line.” Steve and Bucky often repeat this to remind one another of their support and affection. Considering that Steve and Bucky originally grew up in pre-World War II Brooklyn, the two would have experienced homophobia had they been publicly together (which the movies do not touch at all). Harmful experiences like homophobia and queer invalidation present an immediate danger to queer people as such experiences can drive them to internalize these messages and incorporate them into their own self-conception. I mean to argue here that alluding to and including these experiences can potentially hurt the reader, who did not experience any such possibility for harm in canon, so this must be done carefully. When done in such a way that the pain of being queer in an unaccepting environment is resolved—as Kasia does here with the two men understanding that they can be together publicly now—readers can resolve their own pain too. In the same way that readers potentially adopt the harmful messages heteronormative narratives push forward, fix-it fics like this one give readers the ability to adopt a more empowering and hopeful message. Being queer is not

simply a happy ending, because queer people are still people with good and bad experiences; it is possible and necessary to live both the positive and negative parts of life.

I have pulled only three examples for our discussion, but the subgenre is not limited to just these works or these themes; the beauty of Stucky fix-it fics are the possibilities they open up for the audience of Steve and Bucky's relationship. Through fix-it fics of this narrative, it becomes possible for these queer men to be together in various ways; it is in the possibility for these variations that we can see it is possible to live queer lives that are detailed and more complex than some singular image of a queer life. While clearly these works do not explicitly name Sedgwick or other reparative theorists, these fics contribute a great deal to our theoretical discussion on reparative readings and queer praxis. In my argument, I mean to say that at the heart of reparative readings is the effort to dive deeper into a hurtful text knowing that the canon can be hurtful and finding value anyway—for fix-it fic writers, this value comes in reimagining these ending scenes in ways that stay true to the existing character arcs. Audiences of Steve and Bucky do not have to sit in the disappointment of being invalidated by Steve's choice to leave Bucky behind in the original canon because they can have an alternative that is equally as valid as the canon. It is in this collective decision to love that our important understanding of praxis arises. There is empowerment in an audience collectively choosing to reject harmful aspects of a canon narrative and rework the existing characters to fulfill their healing needs.

High Stakes

To reiterate and clarify, fix-it fics are reparative readings that function as a queer reading and queer praxis by subverting heteronormative constraints on public literature and media to give pleasure and nourishment back to the reader. In the previous example, Steve and Bucky's canon ending left readers bereft and unsatisfied, and many people felt cheated and manipulated by the creators' usage of queerbaiting and the later forced straightening of sending Steve back to a woman in his past. Additionally, many fans felt that the canon ending of these characters' storylines rob the characters of their progress and growth over the course of events in movies or television series leading up to this moment. To provide a couple of brief examples: Tumblr user @antifatonystark-moved commented on the ending in a viral Tumblr post published in August 2019:

You really think agent Peggy "I know my worth" Carter would stand for Steve coming back to the 50s or whenever bc he thinks he deserves her? You really think she wouldn't give him their promised dance and then gently but firmly tell him to go home? Really?

You think a well characterized version of Steve Rogers would rob Peggy of her happy ending with a man she loves in favor of what he wants? That he'd abandon all his friends, his family, the whole world, in the 21st century, turn his back on his "home," which has been brought up as a theme for him in two movies. That he'd put his own wants in front of his sense of duty? Y'all think that? Really? (@antifatonystark-moved)

Peggy Carter, the initial romantic interest for Steve, had her own character arc in a spinoff television series titled *Agent Carter* centered around her own independent achievements and professional career. Fans felt that this ending took away from Peggy's accomplishments and reduced her to merely a tool in Steve's happy ending. Similarly, fans felt that the ending disregarded the characters themselves by invalidating their affective experience:

ya ever think about how bucky probably ran from steve because he didn't know who "bucky" was, and even as he gained his memories back and began to realize the true importance of the man he saved from the Potomac, he was damaged and broken and dangerous, and no matter what he'd never be the person that steve wanted him to be, never again. but then steve was back in his life, fighting for him even tho bucky didn't think he was worth any of it, and he gave him an option to heal in wakanda, to feel whole again, and he took it because then maybe he'd be good enough, finally be the person steve remembered instead of his shadow, but the world kept putting guns in his hands because he'd always be a weapon, and he died and when he woke up the person he loved most in the world had decided til the end of the line wasn't forever, it was now (@caraldanvars)

In this popular post published in 2020, this Tumblr user directly speaks to the invalidation of these characters' emotions that leaves both the character and audience feeling bereft. As readers of this relationship begin to identify with Steve and Bucky, they begin to place themselves within the emotional experiences of the character; when the canon disregards these emotions, it feels unnatural and shocking to readers.

The body of work involving fix-it fics devoted to the Stucky relationship alone allows readers to cathartically live out a healthy queer relationship in full. Fix-it fics offer a resolution to implicit subtext by creating a narrative that continues developing these aspects of each character. The models and archetypes readers absorb are important for the development of their identities since readers construct their identities via apparently "valid" or "invalid" representations of gender, sexuality, and bodies (Butler 329). In fix-it fics, these problematic representations are righted so the models that readers absorb are not as inherently constraining and harmful as the heteronormativity within canon. Fix-it fics allow readers to find joy in

different representations through fix-it fics allowing nuanced and queer characters to exist with happy endings. Specifically, fix-it fics deconstruct the limitations around intimacy and physical contact by normalizing physical affection through slash relationships. Steve and Bucky, for example, are often written as very physically affectionate in fix-it fics—sexually and platonically. This reiterates that their connection necessitates more than subliminal hints, and normalizes all types of physical contact between masculine-presenting individuals, as opposed to toxic conceptions of masculinity and male bodies (“Revising” 39). Through redefining the allowances (and deconstructing the notion of allowances), I argue that fix-it fics give readers the ability to ambiguate their own identity and address the heteronormative binaries that try to reify strict demarcations between gender, sexuality, and the body to say that they, too, are allowed pleasure.

Conclusions

Fix-it fics are important to consider as an example of reparative readings for their contribution to what Sedgwick calls “weak theory” through the creation of an inherently more accepting, accessible, and ground-level queer praxis. In contrast to “strong theory” which seeks to “organize vast amounts of territory and tell big truths,” “weak theory” seeks to “decenter what [it] encounters” through inherently non-normative alternatives and methodologies (Love 237; Saint-Amour 438). Fanfiction and fix-it fics are not normalized forms of critique, as those who engage with fanfiction often face their own type of stigma for engaging with an uncommon genre relegated mostly to online spaces and associated with certain stereotypical types of people (“nerds” or “superfans”), and yet they still take part in deconstructing internalized heteronormative ideals. Additionally, since representation is important for nourishing development of personal identities, fix-it fics and fanfiction give people better models and options for their own development. Fix-it fics do this not by lobbying large production companies to change their heteronormative habits (though this is an important step in liberation) but by forcing a “negotiation—rather than a compulsory and passive acceptance—of relationships” (Young 130). This “negotiation” does not need to take place in a physical location but instead can occur in the intangible relationship between reader and narrative. The agenda of fix-it fics, like “weak theory,” focuses on “acts of noticing, being affected, taking joy, and making whole” (Love 238). Fix-it fics take fractured narratives and refit their gaps with nourishing and positive queer adaptations that allow people to challenge heteronormativity within media as well as in themselves. Looking at fix-it fics generally, these works become weak theories of praxis by disobeying heteronormative societies’ desire to withhold information from queer people to either “conform or (and this is not a figure of speech) die” (“Queer and Now” 3). All of these works inherently disregard the goals of

heteronormative structures that seek to limit identity through the creation and dissemination of queer stories of love and sex.

Fix-it fics are an underexplored but important aspect of queer praxis as they give readers the ability to engage with challenging discourses around heteronormativity in mainstream narratives. Using Sedgwick's conception of reparative readings, we can see that fix-it fics and fanfiction function to heal a reader and beloved narrative after the betraying inclusion of heteronormative ideals. In reflecting Sedgwick's reparative reading and Doetsch-Kidder's conception of loving criticism, fix-it fics become an unconventional method for challenging engrained heteronormativity that permeates mainstream media. The accessibility and widespread prevalence of fanfiction make these works an important opportunity for growth within many young readers, and these works can disrupt the internalization of heteronormative identities during important formative stages. Canon, while a source of widely loved and protected universes, can be insufficient for queer representation and fanfiction fills the gaps in representation with authentic and relatable queer identities. Considering that fix-it fics do not focus exclusively on gender, sexuality, race, or ability, these works function to deconstruct heteronormative ideals through intersectional means. A wider exploration of fanfiction yields insights into how people—individually and communally—reject problematic ideals to favor more nourishing possibilities that provide every reader with some sense of cathartic hope.

Notes

¹ As of 2019, Steve Rogers and Bucky Barnes' relationship was listed fourth in "Most Popular Pairing" on Archive of Our Own (one of the most popular compendiums of fanfiction), and currently has 47,170+ works devoted to this relationship (some works may not be included in this count for not using the most common tag).

² In using this term, I am discussing the monolithic ideal of a person in our current society, and this does not solely have to do with sexual orientation. As society works to limit the voices of any person who divulges from the idealized norm of a white, able-bodied, heterosexual cisgender man, "heteronormative" ideals have to do with gender, race, and ability. Heteronormative regulations, then, are those that prioritize the voice of those who match this monolithic image and silence anyone who cannot.

³ As we move forward with defining the important terms regarding fanfiction, I will be using information from non-academic or more publicly available sources such as Fanfiction.net, and I will do this purposefully because these terms are created, popularized, and understood by

and for people who engage with fanfiction. Many of these writers and readers are not high academics entrenched in an intellectual field, and their sources of learning about fanfiction are what is readily available via a Google search.

⁴ Traditionally, the term “canon” has referred to “a rule, law, or decree of the Church” or some sort of ecclesiastical law. Within this meaning, the word held a more final and authoritative connotation, such that “canon” equated law and canon word was meant to be followed closely. For literary studies, the term was then used to mean authoritative or significant texts that were seen as “being of the highest quality and most enduring value,” so canon narratives were held with the highest regards in literary studies. Within fanfic discourse, the definition of “canon” aligns more with the literary definition, as original narratives are often held with respect and seen as final or complete on their own. Fanfic discourse uses “canon” in a broader sense than traditional literary studies does, referring simply to the concrete details laid out by the original narrative a fic is derived from.

⁵ In this discussion, I use the verb “to queer” in line with thinkers like Thelathia “Nikki” Young who conceptualized queering as “troubling [...] of the lenses through which we read experiences, contexts, and intersections” (127). As we queer these texts, we will deconstruct the way we view and consume them while deconstructing the powers that created them.

⁶ The last movie in the Marvel Cinematic Universe’s *Avengers* series had a budget of \$365 million and grossed \$2.8 billion. Disney currently owns and controls this franchise (see, for example, D’Alessandro; Wilkerson.)

⁷ Case studies for capitalist gatekeeping of queer representations include but are not limited to: Disney (Marvel Cinematic Universe & Star Wars), the CW’s *Supernatural*, and Harry Potter.

⁸ It is worth recognizing that not all those who take on this savior role come with the best of intentions, and some efforts to save texts can potentially do further harm to the narrative and its readers. To imbue these narratives with love in ways that “save” them, writers must be careful not to write from the same theoretical and social foundations that created the canon (i.e. writing with the same heteronormative ideals), and they must make the effort not to write from a point of selfish interest (i.e. writing uncharacteristic or unnecessary narratives that service some personal ideal or belief about the characters regardless of their development).

⁹ Gender-bending and race-bending are terms for changing a character’s gender or racial identity. Often, race-bending focuses on canonically white characters with commonly accepted headcanons of being a character of color. Ability-bending is not a term used by fanfic readers and writers, but a term created for the sake of this paper to comprise the multitude of tags and names for writing disabilities into a character’s development or arc.

¹⁰ *Avengers: Endgame* is the last installment of *The Avengers* series within the Marvel Cinematic Universe. It is also the movie that holds the ending to Steve’s story, as the Marvel Cinematic

Universe does not plan to feature more content centered around him or his story with Bucky. Bucky will be featured in his own TV show, but this show will focus more on this life after Steve's exit from the Avengers. For this reason, we will look at the events of this movie specifically and how these fanfics work to navigate this specific ending. (See, for example, Dockterman.)

¹¹ In the previous movies centering around Steve, *Captain America: The Winter Soldier*, (the Winter Soldier referring to Bucky's persona given to him by Steve's enemy) and *Captain America: Civil War*). In *Winter Soldier*, Steve's whole mission revolves around saving Bucky, while his mission in *Civil War* centers around protecting Bucky from being unlawfully imprisoned (which he does to such an extreme that he gives up the mantle of Captain America to be with Bucky).

Works Cited

antifatonymystark-moved. "You really think agent Peggy..." Moved to @helovedyou, 26 August 2019. <https://antifatonymystark-moved.tumblr.com/post/187276973908/you-really-think-agent-peggy-i-know-my-worth>. Accessed 6 March 2021.

Butler, Judith. "Gender Trouble, Feminist Theory, & Psychoanalytic Discourse." *Feminism/Postmodernism*, edited by Linda J. Nicholson, Routledge, 1990, pp. 324-340.

"Canon." *OED Online*, Oxford University Press, March 2021, www.oed.com/view/Entry/27148. Accessed 6 March 2021.

captainjanegay. "Endgame is a bad joke[...]" Rainbows always stand for hope, 12 November 2020. <https://captainjanegay.tumblr.com/post/634607121879695361/endgame-is-a-bad-joke-and-stucky-deserves-better>. Accessed 6 March 2021.

caraldanvars. "ya ever think about how bucky..." scott lang Saved the universe, 27 September 2020. <https://caraldanvars.tumblr.com/post/630419975201505280/ya-ever-think-about-how-bucky-probably-ran-from>. Accessed 6 March 2021.

D'Alessandro, Anthony. "Avengers: Endgame to Near Rare Breakeven Point With \$1.1B Global Opening." *Deadline*, April 27, 2019. <https://deadline.com/2019/04/avengers-endgame-breakeven-profit-after-opening-weekend-box-office-marvel-1202603237/>. Accessed 6 March 2021.

Dockterman, Elena. "You've Seen *Avengers: Endgame* and *Spider-Man: Far From Home*. Here's What Happens Next in the Marvel Cinematic Universe." *Time*, December 10, 2020. <https://time.com/5576491/avengers-endgame-marvel-cinematic-universe-future/#:~:text=Avengers%3A%20Endgame%20is%20the%20last,future%20films%20and%20TV%20shows> Accessed 6 March 2021.

Doetsch-Kidder, Sharon. "Loving Criticism: A Spiritual Philosophy of Social Change." *Feminist Studies*, vol. 38, no. 2, 2012, pp. 444-473.

DopeyPixie. "FanFiction 'Lingo.'" *Fanfiction*, 3 April 2013. <https://www.fanfiction.net/s/9165581/1/FanFiction-Lingo>. Accessed 6 March 2021.

Duggan, Jennifer. "Fanfiction: Remixing Race, Sexuality, and Gender." *Making Culture: Children's and Young People's Leisure*, edited by Anna Sparrman, Kulturalanalys Norden, 2019, pp. 47-50.

Duggan, Jennifer. "Revising Hegemonic Masculinity: Homosexuality, Masculinity, and Youth-Authored Harry Potter Fanfiction." *Bookbird: A Journal of International Children's Literature*, vol. 55, no. 2, 2017, pp. 38-45.

Hawthorne, Sïan Melville. "Reparative Reading as Queer Pedagogy." *Journal of Feminist Studies in Religion*, vol. 34, no. 1, 2018, pp. 155-160.

"Headcanon." *Fanlore*, 16 October 2019. <https://fanlore.org/wiki/Headcanon>. Accessed 6 March 2021.

Love, Heather. "Truth and Consequences: On Paranoid Reading and Reparative Reading." Special issue of *Criticism*, vol. 52, no. 2, 2010, pp. 235-241.

Reißmann, Wolfgang, et al. "Fan(Fiction) Acting on Media and the Politics of Appropriation." *Media and Communication* vol. 5, no. 3, 2017, pp. 15-27.

Romano, Aja. "Canon, fanon, shipping and more: a glossary of the tricky terminology that makes up fan culture." *Vox*, 7 June 2016, <https://www.vox.com/2016/6/7/11858680/fandom-glossary-fanfiction-explained>. Accessed 6 March 2021.

Rowell, Rainbow. *Fangirl: A Novel*. St. Martin's Publishing Group, 2013.

Saint-Amour, Paul. "Weak Theory, Weak Modernism." *Modernism/Modernity* vol. 25, no. 3, 2018, pp. 437-459.

Sedgwick, Eve Kosofsky. "Introduction: Queerer than Fiction." *Studies in the Novel* vol. 51, no. 1, 2019, pp. 110-113.

Sedgwick, Eve Kosofsky. "Paranoid Reading and Reparative Reading, or, You're So Paranoid, You Probably Think This Essay Is About You." *Touching Feeling: Affect, Pedagogy, Performativity*, edited by Michael Moon and Michèle Aina Barale, Duke University Press, 2003, pp. 123-152.

Sedgwick, Eve Kosofsky. "Queer and Now." *Tendencies*, Routledge, 1993, pp. 1-20.

"Slash." Fanlore. January 2020, <https://fanlore.org/wiki/Slash>. Accessed 6 March 2021.

Storynerd. "darling I keep falling back to you." Marvel Cinematic Universe fanfiction. James "Bucky" Barnes/Steve Rogers slash. Archives of Our Own, 8 April 2019. <https://archiveofourown.org/works/18631618>. Accessed 6 March 2021.

TheLadyConstellation. "our dance." Marvel Cinematic Universe fanfiction. James "Bucky" Barnes/Steve Rogers slash. Archives of Our Own, 13 April 2020. <https://archiveofourown.org/works/23630323>. Accessed 6 March 2021.

Wilkerson, David. "Disney to Acquire Marvel Entertainment for \$4B." *MarketWatch*, August 31, 2009. <https://www.marketwatch.com/story/disney-to-acquire-marvel-entertainment-for-4b-2009-08-31>. Accessed 6 March 2021.

Young, Thelathia "Nikki." "Queering 'The Human Situation.'" *Journal of Feminist Studies in Religion*, vol. 28, no. 1, 2012, pp. 126-131.

How the 2019 Mauna Kea Protest Movement Sparked a Hawaiian Cultural Renaissance: A Mini Ethnography

Wailana Medeiros, Political Science

Faculty Mentor: Harriet Phinney, PhD, Anthropology

**Faculty Content Editor: Rob Efird, PhD, Anthropology
and Sociology**

Student Editor: Anna Petgrave, English

Abstract

The construction of the controversial Thirty Meter Telescope (TMT) on the summit of the sacred mountain Mauna Kea has been debated for several years. It has recently sparked a cultural awakening of native Hawaiians in Hawai'i through protests against the telescope. These protests took place throughout the summer of 2019, starting in July, and were attended by native Hawaiians and others standing in solidarity. What came to be known as the Mauna Kea Protest Movement took place primarily on the slopes of Mauna Kea, but in various locations across the state and on social media as well. It inspired a Hawaiian cultural renaissance. The author witnessed this movement as it gained traction through social media, her presence on the mauna, and on the Big Island of Hawai'i where she resides. This ethnography explores how the movement has gained traction, and investigates the cultural renaissance it sparked. It considers themes such as the role of the media, the importance of Hawaiian history, and how the effects of settler colonialism stirred both the recent protest and those of the past. It concludes by discussing the effect the movement itself had on the identity of *Kanaka Maoli*, or native Hawaiian people.

Introduction

July 17, 2019 was the day of the Mauna Kea protest in which Native Hawaiians gathered together to defend their culture and sacred lands against the installation of the Thirty Meter Telescope (TMT). I was there that day, as a Native Hawaiian woman. I knew of the movement, and as it gained traction, I wanted to understand how it had gotten as big as it did, and how it prompted a renaissance of Hawaiian culture. This paper analyzes this cultural renaissance using personal experience, interviews, and research to explore the role of the media, of parallel moments in modern Hawaiian history, and of the effects of settler colonialism in prompting the need for protest, both then and now. I will also discuss some culturally significant phrases that popped up in my research pertaining to the movement, such as *aloha 'āina*, or love of the land, and *kapu aloha*, a philosophical code of conduct created by Native Hawaiians. I conclude by discussing the effect of the movement on the identity of *Kanaka Maoli*, or Native Hawaiian people. But let's begin at the top of Mauna Kea.

The conditions at 9,000 ft. elevation on the peak of one of the tallest mountains on Earth are not easy on the human body. The blistering cold and whipping rain at night and the sun and wind burn of the day are difficult to endure. The night of July 16, my friends and I camped in my car, but I was restless: I knew what was to come in the morning. I got little sleep that night, and instead conversed with myself and my ancestors while admiring the glorious moon-lit outline of Mauna Kea from its base. The next morning, my alarm went off at 5:00; I had managed to get about two hours of shut-eye. I woke my friends, and we prepared for the short trek to the Mauna Kea access road—where it all began.

July 17, 2019, changed what it means to be a Native Hawaiian in Hawai'i. My friends and I sat on the tough lava rocks after chanting in the rising sun "*E ala e ka lā i kahikina [...]*" as we waited for the police officers to come to take away our *kupuna*, our elders. At around 7:15 in the morning, they came. We stood, hundreds of us, in *kapu aloha* as one by one our *kupuna* were arrested and shoved into unmarked white vans that served as police cars.

"Stand for the Mauna now!" Aunty Maxine, an elder protestor, exclaimed with her hands zip-tied, the closing car door drowning out her voice. I clutched my friend's hand, trying to hold back the tears in my eyes. I thought, "Why is this happening? Why is it so hard to be a Hawaiian in Hawai'i? Why are we being arrested for trying to protect something that is important to our identities as *Kanaka Maoli*?" I looked around. I saw the hundreds of other Native Hawaiian faces with the same look of confusion and *'eha*, or hurt, and hot tears falling from their eyes.

Each subsequent day of protest on Mauna Kea gathered more people, despite the harsh weather conditions; sunburn seemed like a small sacrifice when it came to trying to preserve what aspects of our culture we had left. With the increase of support through social media,

more and more people arrived in hopes of educating those who came to stand in solidarity. Mauna Kea is considered to be the *piko*, or center, of the Hawaiian Islands, and the physical embodiment of *Wākea*, or Sky Father, in the Hawaiian pantheon of gods. Mauna Kea is the most sacred mountain—arguably the most sacred land in the Hawaiian Islands to Native Hawaiian people. Hundreds, and later thousands, of people across the state came together to protest the construction of the TMT. The telescope was approved by the state of Hawai‘i to be built on the mountaintop alongside 13 other controversial and contested telescopes situated on the mountain. Through social media, my residency on the Big Island, and my experience as a Native Hawaiian woman, I was able to witness the growth and traction of this incredible movement.

The movement against the proposed construction garnered support over social media and across the Big Island of Hawai‘i, which I witnessed through my time on the *mauna*, or Mauna Kea, and through Instagram.

Subjectivity

It may be obvious by now that I was and am directly affected by this movement. Although I now confidently identify myself as a Native Hawaiian woman, my people’s claims to a Native Hawaiian identity have historically been fraught. One impact of colonization was a reduction in pure Native Hawaiian heritage; consequently, current generations of Hawaiians are often mistaken for being of a different ethnicity, or of a mixed ethnicity—rarely ever as Native Hawaiian. While I have been a Native Hawaiian cultural practitioner of hula and certain aspects of ceremony and spirituality for approximately 17 years, it was only after the events on July 17 and the Mauna Kea movement in general that I was able to feel empowered as a Hawaiian, regardless of blood quantum (a settler-colonial form of oppression which discriminates based on the amount of one’s Hawaiian “blood”).

Through the research process, I have come to recognize that my identity is an important aspect of my research. As such, I sought to interview people whose perspectives and identities reflected the Hawaiian context in which the protest occurred (and is occurring). This ethnography can also be looked at as an autoethnography because of how integrated I am in this process; I used my own personal experience as a Native Hawaiian woman and a protester together with my research to formulate and inform my arguments. I strive to provide a “thick description” (Geertz 6) of the movement from the perspective of the younger generation by examining the symbolic relevance of Native Hawaiian identity and the renaissance prompted by the TMT protest. The process of thick description validates feeling, voices, actions, and meaning to help the reader fully understand the context the writer is trying to portray. This

follows Lila Abu-Lughod's call to "write against culture" (138), countering the ethnographic accounts of the past, which present culture as something that is static, discrete, homogeneous, and coherent. This new perspective engages crossover and intersectionality between different societies, social and cultural changes, subjectivity, and everyday contradictions. I focus my research on complexity and contradiction, intersubjectivity and history, and aim to situate the knowledge I have gained in the context of the current moment.

This research does not encompass every attitude or all experiences of the movement. My goal is to explore the importance of the movement as it pertains to identity and the renaissance of particular cultural values.

Field Site and Methods

The geographic point of my research is the Big Island of Hawai'i. This ethnography is based on my observations during my time protesting on the *mauna* and conversations and interviews I conducted over the internet. I considered ethnography and subject interviews to be important methods, as they contribute to and recognize sovereignty for Hawaiian people. After July 17, I spent the whole summer on the slopes of Mauna Kea with various practitioners, *kupuna*, and young people my age, solely to protest the construction of the TMT. This experience and my consequent research constitute this mini ethnography.

Virtual Participant Observations

Because of the COVID-19 pandemic, I was not allowed to conduct research outside of my home. Therefore, I conducted a virtual ethnography that enabled me to observe and understand how people interact with others through online spaces (Caliandro 552). I also utilized my personal accounts to access different social media platforms, including Facebook, Instagram, Twitter, YouTube, and Zoom, in order to conduct my research. Social media platforms are a useful way to conduct remote research, but I would also like to recognize that they are vital tools in organizing grassroots protests. Therefore, social media played an important role in influencing my interview subjects, the leaders and participants in the movement, and me. Texting, calling, FaceTime, and email were other valuable digital platforms in conducting my research and gathering data. Despite conducting research virtually, the physical presence of my site is important: my informants and I are from and currently reside on the Big Island of Hawai'i. Three of my subjects were able to converse with me in their respective homes over the phone, and the other was able to engage in an email interview.

Interviews

First, I interviewed 19-year-old Kealoha Cariaga, of Napo'opo'o, South Kona, Hawai'i. Kealoha granted permission for her name to be used in this mini ethnography. I've known Kealoha for quite some time now, as we both dance hula. Kealoha was an avid protestor this summer and is active in multiple Hawaiian cultural practices. We agreed on a phone interview, which was formally written and conducted.

I then interviewed Kapulei Flores, also 19 years old, of Waimea, Hawai'i. I selected Kapulei because her mother, Aunty Pua Case, is an active leader of cultural ceremonies and a well-known water protector. Kapulei explained to me that she and her mother have "been standing for the *mauna*" for over 10 years; therefore, her opinion is valuable for my research. Kapulei opted to craft a written response, so I shared with her a GoogleDoc containing various questions pertaining to my research. Kapulei also granted permission to use her real name.

Next, I interviewed 20-year-old Makenzie Kalawaia, who lives in Hilo, Hawai'i. Mackenzie and I are friends, close from our time on the *mauna*. She gave permission to use her real name in this ethnography as well. Makenzie graduated from Kamehameha Schools Hawai'i campus, a school founded by the last princess of Hawai'i, Bernice Pauahi Bishop, with the intent of educating Native Hawaiian youth; Makenzie described the school as a "stepping stone" on her journey to become more culturally informed. Her father is a member of the Royal Order of Kamehameha, a Hawaiian sovereignty organization. I utilize Mackenzie's perspective because she attended Kamehameha Schools and, because of her father's involvement, has been well versed in Hawaiian culture and the sovereignty movement. I conducted an informal interview over the phone from our homes.

Lastly, I interviewed Lanihuli Kanahale, also located in Hilo, Hawai'i. Lanihuli has been a long-time cultural practitioner and an avid *kia'i* (protector), in the *mauna* movement. Her maternal grandmother, Puanani Kanaka'ole Kanahale, is a *kumu hula*, or hula master, and holds an important place in the world of hula. She has done much for *ka lāhui Hawai'i*, or the Hawaiian nation, when it comes to cultural revitalization, including being one of the *kupuna* who was arrested on the *mauna*. I wanted to get Lanihuli's perspective, since she walked with her grandmother to the police vans on July 17. Lanihuli agreed to a FaceTime interview, which was also informal, from her home, and she consented to having her name used.

I decided to interview young people around the same age because in many indigenous cultures, especially cultures with oral traditions such as Hawai'i's, people often look to the perspectives of the elders. I wanted to focus on the perspectives of the younger generation because the *kupuna* have repeatedly stated the importance of the youth standing their ground because the elder's time is almost *pau*, or done. Anthropological indigenous research that focuses on the younger generation can be just as valuable as the perspectives of indigenous elders.

Social Media

This research is shaped not only by these interviews but by other methods as well. The study of scholarly research on ethnography, as well as online activity observation, document analysis, and media and social media analysis, is crucial in my findings. I searched Instagram, Twitter, and Facebook to gather information pertaining to my research questions. I also investigated relevant public profiles, hashtags (#kukiaimauna, #protectmaunakea, #aoletmt, #puuhuluhulu, and more), fora, and articles recommended by related profiles. This led me to a cultural learning Zoom seminar from a profile on Instagram that pertained to the Mauna Kea movement (Perriera). I used the seminar to observe the way it advertised education to Hawaiians and appreciators of the culture, as well as some of the outcomes of the movement itself.

I first searched different Instagram handles, for example, @protectmaunakea, using my personal Instagram account, then Facebook, and then Twitter. I searched using key words such as “*mauna kea*” and “*aloha aina*” to find accounts and hashtags that I deemed most beneficial for my research. I wanted to see how the use of social media and hashtags connected people and strengthened the movement; assessing social media is relevant in that it directly relates to the norms of the younger generation and how they connect, communicate, and mobilize. Each of the Instagram handles provided updates on the Mauna Kea movement, and one provided day-to-day updates from *kia'i* who occupied the mountain during the movement. An account for Pu'uhuluhulu University, a makeshift Hawaiian culture school on the mountain, also provided updates on the movement and gave university schedules pertaining to the Hawaiian classes that would be taught at the *mauna* during the days of active protest to get the *kia'i* community involved.

Importance of History and the Effects of Settler Colonialism

It is not a trivial question to ask if history is important to native research. As Linda Tuhiwai Smith has argued, “[t]he negation of indigenous views of history was a critical part of asserting colonial ideology, partly because such views were regarded as clearly ‘primitive’ and ‘incorrect’ and mostly because they challenged and resisted the mission of colonization” (31). I aim to reclaim history by drawing upon and utilizing the native perspective of history, told through a native lens. For indigenous peoples, “history is important for understanding the present and that reclaiming history is a critical and essential act of decolonization” (Smith 31). Therefore, when it comes to the protest of land disputes by Native Hawaiians in Hawai'i, understanding certain historical concepts is crucial to understanding the way in which they affect the present.

We start in the nineteenth century with the Great Māhele, a land division method set up in early colonial Hawai'i by King Kamehameha III. Hawaiians, unlike white settlers, did not view land as property, so the notion of a land division was a foreign concept. The Great Māhele was outwardly presented as progress for the Hawaiian Kingdom, yet in reality, Hawaiian lands were unwillingly taken in an unfortunate attempt to turn both lands and people from "barbarism to civilization" (Banner 275). This benefited the rich white settler populations at the expense of Hawaiian peoples. Lilikalā Kame'eleihiwa explains that in the aftermath of the land division,

[a] quiet revolution had been accomplished whereby foreigners now controlled all the *'āina* [land], even that of the *mō'ī* [royalty], because the *ali'i* [district chiefs] had submitted themselves to the foreign rules of the Land Commission. Hawaiian sovereignty, manifest in the control of the *'āina*, had been usurped by foreigners behind a facade of American legal jargon. (225)

Although these resolutions seemed innocent enough and claimed to benefit the native people of Hawai'i in the beginning, they paved the way for foreigners to gain *'āina* in Hawaiian towns.

We then see the effects of the Great Māhele along with the overthrow of the Hawaiian Kingdom and annexation. Queen Lili'uokalani was forcefully overthrown in 1898 by white businessmen looking to annex Hawai'i to the United States; they were successful in their endeavors, but at the expense of the wellbeing and sovereignty of many Hawaiian people who had to abide by the new constitution set up by these white men. Among other things, Hawaiians were shamed for speaking in their native tongue, an attempt by white settlers to decentralize Hawaiian culture. The suppression of the *Kanaka Maoli* continues over one hundred years after annexation. There have been many waves of protest for sovereignty since annexation. In the twentieth century, protests of the 1960s, 1970s, and 1980s prompted their own versions of Hawaiian Renaissance. Hawaiians did not have control over their land and waters, and with the incursion of United States law, western values, and practices, native peoples were dispossessed of their lands and natural resources, resulting in the inability to sustain themselves and their native cultural practices. Hawaiians, angered by the continued mismanagement of their land, channeled their anger into their protests. Mililani Trask, an interviewee for "The Autobiography of Protest in Hawai'i" and a Native Hawaiian attorney and founder of the Indigenous Women's Network, says "[w]hat do we have to do in order to survive in this day and age? The answer to that is self-determination and sovereignty" (Mast 393).

Settler colonialism resulted in systemic oppression, fueling land protests and shedding light upon other Native Hawaiian issues and land disputes. The whole movement tapped into an ancient Native Hawaiian appreciation of the land. As a result of the late-twentieth-century sovereignty movement, Hawaiians questioned not only the Great Māhele, but the way that Hawaiian lands were historically distributed in general. These concerns include the Mauna Kea TMT telescope dispute, the result of yet another forceful claim to Hawaiian lands. The State of Hawai'i's Board of Land and Natural Resources (BLNR) issued a general lease in 1968 to the University of Hawai'i for the purpose of building a single telescope complex at Mauna a Wākea. Upon doing so, multiple telescope complexes were developed, prompting public protests that claimed that the new development violated the state's initial general lease; these protests have lasted for decades since 1968, most recently emerging in the 2019 Mauna Kea TMT protest, the largest in modern Hawaiian history (Maile 332).

In 2011, after the University of Hawai'i applied for a Conservation District use permit for permission to build the TMT, a petition was filed with the BLNR for a contested case hearing. However, the BLNR ended up steamrolling the process and approved the use permit before holding the hearing. This occurred even as the university's application explicitly declared, "[t]he impact on cultural resources has been, and would continue to be, substantial, adverse, and significant" (Maile 60). The dispute arose again in the summer of 2019, when a *kāhea*, or call, was issued to the people of Hawai'i to gather at the base of the mountain to physically stop construction trucks from proceeding. This resulted in large-scale protests, an uprising of the Hawaiian people, and a cultural renaissance.

The Effects of *Aloha 'Āina* and *Kapu Aloha* on the Movement

Aloha 'āina, which literally translates from Hawaiian language to "love of the land," is a particularly important cultural value. Trask describes the teachings of *aloha 'āina* as "living in balance with yourself, God, and the earth" (Mast 394). She believes that it is the job of the *Kanaka Maoli* to

maintain the balance of the earth and the heavens, to keep the connection with the land and with God. If we pass away, it's not just losing a traditional culture, which is priceless, but it is also losing the *'āina*, the whole archipelago. Which is why we move for sovereignty and self-determination. (Mast 394)

From my time atop Mauna Kea, I can recall the countless *aloha 'āinas*! chanted in unison. In my interview with Lanihuli, I asked her what her definition of *aloha 'āina* was. After thinking

for a while, she said, “[w]ell we have to look at the word aloha first, which has been misused so many times throughout history. *Alo*, meaning face. And *hā*, meaning breath” (Kanahele). She explained that Native Hawaiians (like many other Pacific Islanders) show affection by pressing their foreheads to each other and breathing in each other’s *hā*. Lanihuli further explained that this was the act of establishing a relationship, and therefore *aloha ‘āina* was the same act in the sense that one is establishing a relationship with the land—caring for the land, because we are not able to live without it.

‘Āina itself translates to “land,” but if the word is taken apart by the method that Lanihuli used, it translates to “that which feeds.” *Aloha ‘āina* describes not only the unconditional love that one has for the land that feeds them, but the connection and relationship that one has to it. There is a proverb in Hawaiian teachings: “*He ali’i ka ‘āina, he kauwā ke kanaka,*” or, “the land is chief and humankind is its servant.” The *Kanaka Maoli* perspective of *aloha ‘āina* is integral in the movement, for Hawaiians are defending their most sacred land. I asked Kapulei how important she thought that *aloha ‘āina* was to the movement, and she responded, “[a]loha ‘āina shows the lengths we will go to for the places that we love and need to protect. I feel like it is a way to ground back into the true reason you support the movement, which is because of the *mauna*.” With the widespread use of *aloha ‘āina* throughout the movement, it is not hard to see why Hawaiians want to incorporate this important Hawaiian value into their everyday lives, as their ancestors have done. Kealoha, Makenzie, and Kapulei all had similar answers when describing to me how they incorporate *aloha ‘āina* into their everyday life: “[i]t can be from the simplest thing like picking up rubbish when I go to the beach, to planting native plants, to being in a frontline to protect your sacred *mauna*” (Kalawaia).

Usually following the chants of *aloha ‘āina!* you could hear *kapu aloha!* One might define *kapu aloha* as a form of civil disobedience similar to that of Martin Luther King, Jr. Kapulei explained to me:

Kapu aloha isn’t just a saying[;] it represents and stands for the way you conduct yourselves in intense situations as well as on a daily basis. On the Mauna during the frontline stance, *kapu aloha* was a way to remind people to remain in their highest conduct; the conduct you would have at a temple or church, because that is how sacred the *mauna* is. This conduct wasn’t just for frontline actions with the police, but anytime you were on the *mauna* or off the *mauna* representing the *mauna*. It reminded you to be *pono*, be your best self, and react to situations in the best way you possibly could. (Flores)

Kapulei's comment reminded me of a story that Lanihuli told me pertaining to *kapu aloha*. She had just gotten down from the *mauna* and was complaining to her cousin about various problems. He then reminded her, "Eh! *Kapu aloha!*" She responded, "We aren't on the Mauna anymore!" to which he responded, "We are always on the *mauna*." Despite the peaceful form of protest, Hawaiians seeking to protect their land were labeled as violent: "*kia'i* protecting Mauna a Wākea [a more formal term for Mauna Kea] have halted TMT from being built but, in doing so, been labeled violent. On July 14, 2015, Hawai'i governor David Ige signed an emergency rule passed by the BLNR to criminalize and remove *kia'i*" (Maile 333). The protests in 2019 are a reflection of those in 2015: peaceful Hawaiians gathering to protest, but labeled as violent by the media. In response, Hawaiians urged people to go to Mauna Kea to witness the way they held themselves there. One could look at social media or go to the protest itself and see that there was clearly no threat of violence from any protestor. Threats and claims of violence were attempts from the settler state to continue construction and silence native pleas (Maile 329). *Kapu aloha* has helped the movement itself gain traction. People have watched in awe as hundreds of Hawaiians stood face to face with police officers peacefully, in *kapu aloha*, and won.

The Role of the Media

Social media has impacted the publicization of the Mauna Kea movement. Each Instagram page used in my research is operated by *kia'i* who call themselves protectors of the mountain. As such, users are able to get a secondhand experience by looking at *kia'i* Instagram and Facebook stories and posts, which pertain to the movement. The purpose of these accounts is to create community and awareness for the movement, a seemingly successful endeavor given the large number of followers for each account; the largest account had around 135,000 followers. All are relatively new social media accounts, so it was impressive that they were able to accumulate so many followers in a short period of time. Each hashtag I used has a minimum of 4,000 posts, which demonstrates the multitude of people with whom the protest resonates (@protectmaunakea). I found that the availability and sheer quantity of hashtags allowed Hawaiians to show how they perpetuate their culture not only through standing up for Mauna Kea, but in how they use *aloha 'āina*, *kapu aloha*, and other Hawaiian values in their daily lives.

I asked Makenzie how she understood the role of social media in the movement, and she replied,

In the media, before they posted only a little bit about Mauna Kea after 2015 and people kind of neglected it a little bit, but then after and during this whole movement, and how much people actually showed up [...] It spread like wildfire. It was amazing to see, all these people from all over the world were coming. Celebrities were coming, everybody. It was just really getting out there. It was good to know that other people knew that we needed help as Hawaiian people. (Kalawaia)

These platforms not only allow the public to connect with Hawaiians perpetuating their culture but also give them a view of what's happening on Mauna Kea, letting them determine for themselves their stance on the matter. Social media provides the public another source of knowledge and information regarding Hawaiian culture and provides the choice to participate by giving updates about where *kia'i* will visit around the islands and what workshops are available. Due to COVID-19 restrictions, advertisements for Zoom workshops have risen in popularity. New protests have sprouted around the islands, as well as around the world, because of the success on Mauna Kea. These protests are also using social media to spread awareness about the desecration of sacred lands.

***Kanaka Maoli* Identity and Mauna Kea**

The film *Like a Mighty Wave* synthesizes the purpose of the movement. In this film, the statements of Kaho'okahi Kanuha, another avid leader of the Mauna Kea movement, struck me: “[w]e aren't trying to do anything we haven't before. We are trying to do it again” (Inouye 12:50). Many Hawaiians have struggled with the question of how to maintain their cultural identity in a modern world; nevertheless, Hawaiians continue to stand for their land and to learn what it means to be Hawaiian in Hawai'i. Each of the factors that I have discussed throughout this mini ethnography shows that the whole movement has done a great deal to remind and teach *Kanaka Maoli* who they are, what they come from, and why that is important for *ka lāhui Hawai'i*. In Victoria Keith's film *Hawaiian Soul*, Tamara Morrison, a Hawaiian woman, explains that before the 1970s, “growing up Hawaiian then, it wasn't cool. I grew up being ashamed I was Hawaiian” (Keith 2:35). But she said that after “all of the Hawaiian activism in the 70s, the cultural renaissance that went on, the anger that was held all those generations just burst. The Hawaiian voice started emerging” (Keith 3:55).

These attitudes are reflected in today's Hawaiian world. Anger was shared throughout an entire Hawaiian nation, resulting in this explosion and renaissance of Hawaiian culture in 2019. I asked Kealoha Cariaga how she has seen the movement affect fellow *Kanaka Maoli*, and she replied,

You know some Hawaiians were asleep. They were not aware of who they are, they were not connected to that *piko*, to that sacredness. So, when this all happened, you know, it awakened our community and our *lāhui* and you know, just shot at them with a big reminder that they are *kanakas*, and that they do have *kuleana* [responsibility] in Hawai'i. (Cariaga)

I asked her if this was something that she thought makes them proud, to which she replied, “[o]f course! Of course it makes them proud. Being a Hawaiian should make you proud. Because you know, that’s what makes us who we are, that is our identity. Nobody else can have that except for us Hawaiians” (Cariaga).

Each of my informants used a variation of the word awakening, or waking up, implying that now Hawaiians are more aware of their cultural identity and are using that awareness as a vehicle to benefit the future for the next generation. Makenzie Kalawaia expressed her feelings as a Native Hawaiian after the movement: “I feel a lot more empowered. Just because, I used to be like ‘oh I just went to Kamehameha’ and that was enough. But Kamehameha School[s] was just a steppingstone [...] I realized that it was like ‘okay this is your pathway, you have to keep up your culture,’ I realized that I need to do it on my own and take the initiative.” Makenzie described her process of “awakening” and how she will use her knowledge to “wake up” the upcoming generation.

Part of cultural identity is fully knowing one’s culture, Lanihuli Kanahale expressed. Her family performed ceremonies on the Mauna Kea access road three times a day, and also taught classes for Pu’uhuluhulu University—a makeshift school founded in 2019 as a result of the protest, located right on the lava rocks, which aims to pass on knowledge to the Hawaiian nation. Pu’uhuluhulu University consists of *kumu*, or teachers, mostly Native Hawaiian, who share their *mana’o*, or thoughts, about different aspects of Hawaiian education. Many who spoke while I was there came from the University of Hawai’i and lectured about their own specific fields free of charge. Some of the classes taught at Pu’uhuluhulu University include hula, chanting, Hawaiian history, *’ohe kāpala*, or Hawaiian stamp printing, and more. Lanihuli Kanahale spoke of cultural education:

The ceremonies and *aha* contributed to the rise of the people, it made people curious. Hawai’i is reborn. Chants are a huge part of communicating with and changing our environment, especially hula. We wanted to communicate all the “good jujus” to the environment, and above. (Kanahale)

Kanahale further explained that she recognized her privilege in having access to these chants and hula, while some people did not. As a result of her education in Native Hawaiian chants

and hula and knowing the disparity in cultural access, Kanahele taught hula and chants at Pu'uhuluhulu University. She shared that, looking at the faces of people eagerly learning chants and hula, she saw the desire to be more active and involved in culture. She saw a Hawaiian nation, reborn.

Conclusion

As I have exhibited, the Mauna Kea protest movement was more than just a protest; it started a revolution in Hawaiian thinking, a renaissance of Hawaiian culture, and a rebirth of a nation that better knows what it means to be Hawaiian in a modern world. I asked each of my informants what this could possibly mean for the future, and each replied with an extremely optimistic answer. Although I have worked with one specific group of informants, I believe that this ethnography, which has been made complete with other sources of literature and media, has addressed vital points dealing with decolonization of the mind and the place of modern media in native affairs. This research, although restricted due to the COVID-19 pandemic, may prove beneficial in educating others and doing its part in amplifying historically silenced Hawaiian voices. This research touches on not only a few elements of the colorful Hawaiian culture, but also the day-to-day impacts of cultural identity and generational trauma. While I have broached this subject, more research is needed to understand the complexities of Native Hawaiian culture and history to then better bring forth native voices and perspectives, and begin to heal from its subjection to white settler colonialism.

Works Cited

Abu-Lughod, Lila. "Writing Against Culture." *Recapturing Anthropology: Working in the Present*, School of American Research Press, 1991, pp. 137-154.

Banner, Stuart. "Preparing to Be Colonized: Land Tenure and Legal Strategy in Nineteenth-Century Hawaii." *Law & Society Review*, vol. 39, no. 2 (2005): 273-314. Accessed June 2, 2020. *JSTOR*, www.jstor.org/stable/3557617.

Cariaga, Kealoha. "Re: How the 2019 Mauna Kea Protest Sparked a New Cultural Renaissance in Hawai'i." Received by Wailana Medeiros, 14 May 2020.

Flores, Kapulei. "Re: How the 2019 Mauna Kea Protest Sparked a New Cultural Renaissance in Hawai'i." Received by Wailana Medeiros, 26 May 2020.

Geertz, Clifford. "Thick Description: Toward an Interpretive Theory of Culture." In *The Interpretation of Cultures*. New York: Basic Books, 1973.

Inouye, Mikey. *Like a Mighty Wave: A Mauna Kea Film*. YouTube. Copyright 2019.
www.youtube.com/watch?v=4J3ZCzHMMPQ&t=806s

Kalawaia, Makenzie. "Re: How the 2019 Mauna Kea Protest Sparked a New Cultural Renaissance in Hawai'i." Received by Wailana Medeiros, 15 May 2020.

Kame'eleihiwa, Lilikalā. *Native Land and Foreign Desires: Pehea Lā E Pono Ai? Ko Hawai'i 'Āina a Me, Nā Koi Pu'umake a Ka, Po'e Haole; How Shall We Live in Harmony?* Bishop Museum, 1995.

Kanahele, Lanihuli. "Re: How the 2019 Mauna Kea Protest Sparked a New Cultural Renaissance in Hawai'i." Received by Wailana Medeiros, 29 May 2020.

Keith, Victoria. *Hawaiian Soul*. YouTube. Copyright 1987.
www.youtube.com/watch?v=YT7NEG_ikYA

Maile, David Uahikeakalei'ohu. "Resurgent Refusals: Protecting Mauna a Wakea and Kanaka Maoli Decolonization." *Hūlili: Multidisciplinary Research on Hawaiian Well-Being*, vol. 11, no. 1 (2019), pp. 57-69. Accessed June 1, 2020. kamehamehapublishing.org/_assets/publishing/hulili/Hulili_Vol11_3.pdf

---. "Threats of Violence: Refusing the Thirty Meter Telescope and Dakota Access Pipeline." *Standing with Standing Rock: Voices from the #NoDAPL Movement*, edited by Estes Nick and Dhillon Jaskiran, pp. 328-43. Minneapolis; London: University of Minnesota Press, 2019. Accessed June 2, 2020. www.jstor.org/stable/10.5749/j.ctvr695pqq.30.

Mast, Robert H., and Anne B. Mast. *Autobiography of Protest in Hawai'i*. University of Hawai'i Press, Honolulu, 1996.

Perreira, Ku'ulei. (Producer). (2019) *Decolonization of God* [Zoom recording].
@protectmaunakea. Posts. *Instagram*, Jul.-Aug. 2019. <https://www.instagram.com/protectmaunakea/>. Accessed 10 Aug. 2020.

Smith, Linda Tuhiwai. *Decolonizing Methodologies: Research and Indigenous Peoples*, 2nd ed., Content Technologies, 2013.

Entry Point for Assessing Sustainability in Ecotourism: Insights from Costa Rica

Monica McKeown, '20, International Studies and Spanish

**Faculty Mentor: Felipe Murtinho, PhD,
International Studies**

**Faculty Content Editor: Tanya Hayes, PhD,
Institute of Public Service**

**Student Editor: Isabelle Halaka, International Studies
and Political Science**

Abstract

Tourism is a rapidly growing industry; many are attracted to the prospect of ecotourism enterprise in small communities. Tourists are increasingly drawn to locations for a combination of natural beauty and adventure opportunities. Because the ecotourism industry is growing rapidly, assessment is necessary in order to maintain focus on the sustainability goals of ecotourism. Existing assessment frameworks measure the sustainability of ecotourism projects, but there is an absence of broader criteria to act as an entry point into the ongoing process of sustainability assessment. In order for assessment to be more useful and more easily conducted, there is a need for a new set of sustainability indicators. This paper reviews the literature on sustainability indicators recommended for assessing ecotourism and proposes a new set of assessment criteria for implementation in systematic evaluations of ecotourism for large-scale use, and also as a first step in beginning assessments. A meta-analysis of eight case studies offers in-depth review of the assessment tools used to evaluate ecotourism in Costa Rica. Sustainability indicators in the literature can be overly complex, so these proposed criteria are more user-friendly and can be applied to a broader industry. Because it can be applied more widely, it has the potential to have a greater impact on global progress toward sustainability in the ecotourism industry.

Introduction

Tourism is the largest and most rapidly growing industry worldwide, with over \$7 trillion in revenue annually and a growth rate of around 25% per year; ecotourism has shown the greatest expansion within the tourist trade (Cox, 2006; Jones, 2005; Thomas et al., 2014). Ecotourism draws on people's desire for adventure while remaining environmentally friendly. Activities such as hiking to a waterfall, birdwatching, visiting indigenous lands, and kayaking are all examples of ecotourism. There has been an increasing number of people who are interested in conservation and natural exploration, and as a result, this type of adventure travel has become highly marketable (Tsaour et al., 2006; Van Tassell & Daniel, 2006). In comparison to other types of tourism, ecotourism is intended to provide more benefits for local communities and individual livelihoods, reduce leakage of profits out of the country, and promote sustainable development and conservation (Jones, 2005; Lee & Jan, 2018). This has represented a shift from the goal of tourism development to a goal of wellbeing in the host community (Gary & Campbell, 2009). Ecotourism is important because it provides a way to protect natural ecosystems, cultivate environmental appreciation in local communities, and draw tourists to enjoy regional beauty. Ecotourism locations are now featured in travel guides, and the environmental appeal of destinations like Costa Rica, Peru, Nepal, and other countries has become part of regional national identity (Cox, 2006). With the rapid growth of ecotourism, sustainability assessment in these destinations is important to maintaining success rates.

Sustainability indicators proposed in ecotourism literature are very thorough forms of assessment, but lack a starting point that is easy to access, implement, and monitor. Choi and Sirakaya (2006) as well as Tsaour et al. (2006) emphasized that a common framework for assessment does not exist, nor does a shared management tool. Choi and Sirakaya's proposed checklist of indicators is meant to help local communities examine the current condition of their resources; but they said that the support of both national and international governments is crucial because local governments often do not have enough resources for success (Choi & Sirakaya, 2006). Thomas et al. (2014) stated that for sustainability indicators to be successful, they need to be technically and economically feasible, in addition to being easy to understand. Thomas et al. also noted the possibility of adding assessment of political cohesion to future studies; this paper addresses this call to further study some of these important social indicators. Tsaour et al. (2006) states that additional measurements would be needed for locations that differ from the type in their case study. The sustainability indicators proposed in this paper seek to fill these gaps and create a standardized, easy-to-use set of assessment criteria.

Ecotourism is intended to be a more sustainable form of nature-based tourism, and because of this, it must be assessed for its sustainability success. Frameworks that assess the sustainability of ecotourism projects do exist, but there is an absence of broader criteria to systematically assess a wider region, or to act as an entry point into the assessment process. The existing lists of sustainability indicators are far too complex and not applicable to a wide array of ecotourism businesses. A new set of sustainability indicators is needed for assessments to be more easily conducted. Because the ecotourism industry is growing rapidly, simple assessment tools are necessary in order to maintain focus on the sustainability goals of ecotourism.

This paper reviews the literature on ecotourism and indicators of sustainability to highlight the gaps, and then proposes a new set of simplified assessment criteria (Table 1). The proposed criteria are to be used as an entry point into the ongoing systematic assessment process of regional ecotourism sustainability. This new set of criteria is based on an analysis of sustainability indicators in the literature and the examination of eight ecotourism case studies from Costa Rica (see Appendix for list of case studies). Costa Rica was chosen as the location for analysis because it is a popular ecotourism destination and because it poses concerns for the sustainability of ecotourism projects. By applying the proposed criteria to the Costa Rica case studies, this research highlights how the criteria can be used in assessment and why the selected indicators are important.

Background Information

Sustainability in Ecotourism

Fundamentals of sustainability literature have mostly reached consensus in defining what constitutes sustainable development. The United Nations World Commission on Environmental Development (UNWC) defined sustainable development as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (UNWC, 1987, p. 41). Tsaur et al. (2006) proposed that complete sustainable development should consider the economic, environmental, and social aspects of development with the objective to create a healthy balance where all three aspects are preserved.

With the rise of ecotourism as a sector of the massive tourism industry, it is also important to define ecotourism. One of the most widely accepted definitions of ecotourism, by the World Conservation Union’s (IUCN) Commission on National Parks and Protected Areas, is as follows:

Environmentally responsible travel and visitation to relatively undisturbed natural areas, in order to enjoy and appreciate nature (and any accompanying cultural features—both past and present) that promotes conservation, has low visitor impact, and provides for beneficially active socio-economic involvement of local populations. (Thomas et al., 2014, p. 51)

In order to apply this definition of ecotourism to an activity, all of the community and economic benefits must be continuous with environmental protection and low ecosystem impact (Thomas et al., 2014). Tsaour et al.'s (2006) three aspects of sustainable development—environmental, economic, and social—are the fundamental elements of ecotourism.

First, the environmental sustainability of ecotourism lies in recognizing that natural resources and the environment are finite and must be protected in order for future generations to enjoy the benefits they provide (Choi & Sirakaya, 2006). Conservation and sustainable development in tourism ventures are essential because the ecotourism industry would not survive without tourists' continued ability to experience the natural beauty of the world (Tsaour et al., 2006). Second, the economic feasibility of an ecotourism operation must be ensured, because tourism at its base is a commercial activity (Choi & Sirakaya, 2006). In order for a tourism venture's economic sustainability to be in line with the definition of ecotourism, there must be an emphasis on distribution of benefits throughout the local community as well as a consideration of the destination environment's limitations (Choi & Sirakaya, 2006). Third, in order to be socially sustainable, ecotourism enterprises must benefit the local community and respect local cultures (Choi & Sirakaya, 2006). Delegating all leadership roles and decision-making processes to the local community allows locals to control the success of an ecotourism enterprise and fosters pride within the community through personal connections to preserving the environment (Choi & Sirakaya, 2006).

With each tourist destination, there will be differences in the balancing point between resource preservation and development. Ecotourism has been found to reduce threats to biodiversity by limiting the unsustainable harvesting of wild plants and animals and the killing of wildlife that threaten crops or livestock (Kiss, 2004). Additionally, ecotourism provides the economic alternative to environmentally destructive land uses such as agriculture and livestock production (Kiss, 2004).

There is some controversy over the effectiveness of ecotourism on the global scale. Tsaour et al. (2006) asserted that many ecotourism destinations are labeled as such but are not actually practicing conservation because they prioritize profit, and thus manipulate the ecotourism brand solely to attract tourists. Ecotourism ventures can be assessed using various lists of key elements that affect sustainability. These lists or sets of criteria for assessment are often referred to as "sustainability indicators." Tsaour et al. (2006) argued that the wide use of

objective indicators can be misleading because when measuring quality of life there needs to be more qualitative assessment. Using qualitative indicators does not detract from the utility of such measurements, say Tsaur et al., but instead brings fuller context to the assessment. This begs the question: how is ecotourism typically evaluated, and what are important indicators of sustainability?

Frameworks of Assessment

As previously stated, there needs to be a cohesive framework for assessing ecotourism sustainability. Numerous indicators have been identified as a means of informative measurement to assess and monitor progress toward sustainable development (Choi & Sirakaya, 2006; Thomas et al., 2014; Tsaur et al., 2006). Thomas et al. (2014) suggested that indicators must be economically and technically feasible to measure, as well as easy to understand, or else they lose their effectiveness. According to Choi and Sirakaya (2006), sustainability measurement systems should be treated differently from the quantitative assessment of economics and growth by which mass tourism is typically evaluated. Instead, the sustainability assessment of ecotourism activities should be measured through a qualitative approach (Choi & Sirakaya, 2006). While using indicators at all may appear to be a more quantitative form of measurement, each indicator can be individually assessed in a qualitative fashion. Additionally, there must be structure and process in the assessment of ecotourism to ensure the long-term sustainability of the location (Choi & Sirakaya, 2006). Thomas et al. (2014) provided a list of benefits resulting from using good indicators. These benefits include, but are not limited to, lower risks and costs through better planning, timely identification of impacts and ability to take early corrective action, measurements of performance outcomes, more public accountability, and overall improvement through constant monitoring (Thomas et al., 2014).

There are many similarities in the extensive lists that Choi and Sirakaya (2006), Thomas et al. (2014), and Tsaur et al. (2006) have each designed with indicators relevant to measuring sustainability in ecotourism. These three lists are representative of the broader literature available on sustainability indicators. Many lists of assessment criteria are complex and are not applicable to a wide range of ecotourism projects, but many have themes in the three pillars of ecotourism previously mentioned (economy, environment, and community). Choi and Sirakaya (2006) emphasized local policy and regulation such as land zoning and waste management policies, whereas Tsaur et al. (2006) focused on visitor experience, such as “satisfying interpreter service” (p. 646) and “providing excellent natural and humanistic experiences,” (p. 646) which were not as prominent in the other two studies. Thomas et al. (2014) used indicators relating to waste management that neither of the others specify, such as “energy consumption [and] demand” (p. 55). The theoretical definitions of ecotourism and

sustainability are the same, but they diverge in practice. The variance in indicators described by Choi and Sirakaya (2006), Thomas et al. (2014), and Tsaur et al. (2006) show that these concepts can be applied in numerous ways to achieve the goal of sustainable tourism.

This essay argues that the literature on sustainability indicators is missing an important aspect of functionality. These long lists of indicators are thorough but not applicable to a broader area, such as an entire country’s ecotourism industry, because of their complexity and specificity. They all have 15 or more different indicators, and some, such as “air quality index” (Choi & Sirakaya, 2006, p. 1282) and “destroying public security” (Tsaur et al., 2006, p. 646), are irrelevant to small communities just beginning ecotourism enterprises. The following proposed set of sustainability indicators is meant to fill this gap and apply flexibly to a wider range of ecotourism projects at a more accessible starting point.

Based on the three sets of sustainability indicators from Choi and Sirakaya (2006), Thomas et al. (2014), and Tsaur et al. (2006), and eight case studies of ecotourism projects in Costa Rica (Appendix A), I have created a simplified list of sustainability assessment criteria. This is intended for use as the first step for communities to begin an assessment that covers the most important aspects of sustainability in ecotourism. Other, more extensive measures are still needed for further assessments.

Proposed Assessment Criteria

I propose the use of the simplified assessment measures in Table 1. The following list has been synthesized from common indicators in Choi and Sirakaya (2006), Thomas et al. (2014), and Tsaur et al. (2006), as well as from key findings in the eight case studies.

Table 1 Proposed Assessment Criteria

1	Economic	a	Diversity in economic enterprises
		b	Local employment and revenues kept in local community
2	Social	a	Community communication and cohesion
		b	Training and educational opportunities for locals
3	Environmental	a	Long-term growth plan for waste and carrying capacity
		b	Environmental appreciation and consciousness in locals and visitors

Research Design

Case Study Context

The literature showed a gap in tools for beginning the sustainability assessment process. Costa Rica has a broad array of case studies featured in the literature on ecotourism (as detailed below) and is a prime example to study the use of indicators as an assessment tool for ecotourism. Studies by Choi and Sirakaya (2006), Thomas et al. (2014), and Tsaour et al. (2006) have shown that indicators are important to understanding and gauging sustainability, so analyzing the use of indicators in assessments of ecotourism projects in Costa Rica is an important step in creating a new standardized and easy-to-implement framework of indicators.

Methods: Case Study Selection and Analysis

This paper specifically looks at eight case studies in the literature on ecotourism in Costa Rica (Cusack & Dixon, 2008; Driscoll et al., 2011; Gary & Campbell, 2009; Howitt & Mason, 2018; Matarrita-Cascante et al., 2010; Sanchez, 2018; Stem, Lassoie, Lee, Deshler, & Schelhas, 2003 and Stem, Lassoie, Lee, & Deshler, 2003; Weinberg et al., 2002) and examines the types of assessments being used in each study. The eight case studies were selected through keyword searches on Google Scholar and Academic Search Complete (EBSCO). The keywords used were “ecotourism,” “sustainability,” “assessment,” and “Costa Rica.” The eight studies were selected because they each offered a significant assessment of an ecotourism enterprise.

Important assessment criteria were synthesized from these eight case studies with consideration of the indicators proposed by Choi and Sirakaya (2006), Thomas et al. (2014), and Tsaour et al. (2006) to perform a meta-analysis of ecotourism assessment in Costa Rica and create a large-scale assessment framework. Using the information gained from this analysis along with the literature available on sustainability indicators in ecotourism, a new set of assessment criteria is proposed. These criteria are to be used as an entry point into the assessment process by way of user-friendliness and applicability to a wide range of ecotourism enterprises.

The eight case studies (Appendix A) were examined for their use of the proposed assessment criteria (Table 1). Depending on the extent to which each proposed indicator was assessed, they were sorted into three categories: “sufficiently mentioned” assessment of sustainability indicator, “mentioned to some extent,” and “not mentioned.” The category for sufficiently mentioning the assessment of an indicator was determined by whether a case study gave information directly about the proposed indicator. When a case study mentioned something similar but not equal to the indicator, it was marked as “mentioned to some extent” and a description of the similar assessment was given. When a case study did not mention

anything similar to the proposed indicator, it was noted as “did not mention.” After each proposed indicator was assessed for each case study, the case studies were divided into three categories: high, medium, and low congruence with the proposed assessment indicators. “High congruence” means that all the indicators were mentioned at least to some extent with at least three sufficiently mentioning the indicator. “Medium congruence” has fewer than three sufficiently mentioned or two or fewer that are not mentioned at all. “Low congruence” has more than two indicators that are not mentioned at all in the assessment.

Costa Rica Area Context

Costa Rica is a hotspot for ecotourism and has been a leading force in the movement to protect the environment through tourism (Rodriguez, 2016). In 1992, Costa Rica was named “the number one ecotourism destination in the world” by the US Travel Society and by 2000 was receiving more than 1 million tourists annually, a significant number of visitors to a country of only 4 million people (Sanchez, 2018, p. 123). Currently, Costa Rica receives more than 2 million tourists annually, and the number is constantly growing (ICT, n.d.). Costa Rica has the most stable government and the highest standard of living in Latin America, contributing to the appeal to tourists (Van Tassell & Daniel, 2006). In this biologically diverse country, there are many opportunities for nature-based tourism. Costa Rica makes up only 0.5% of the world’s land area, roughly the size of West Virginia, but boasts more than 5% of the world’s biodiversity, making it the area with the highest concentration of biodiversity on the planet (Rodriguez, 2016; Van Tassell & Daniel, 2006). There are a wide range of ecosystems throughout the country with temperatures ranging from 30 degrees Celsius (86 degrees Fahrenheit) in tropical forests to places in the Talamanca mountain range that are freezing throughout the year (Sanchez, 2018).

In Costa Rica’s recent history, unfortunate rural development policies led to a significant loss of forested area, but innovative national strategies stopped deforestation and repaired forest cover (Rodriguez, 2016). Now, Costa Rica’s multi-billion dollar (USD) ecotourism industry relies on the country’s biodiversity and protected areas; this increase of tourism has led to an increase in consciousness around protecting the environment (Mok, 2005; Rodriguez, 2016). It was not a quick process to convert the economy, but after more than 25 years of hard work, Costa Rica has tripled its GDP while also doubling the size of its forests (Rodriguez, 2016). Some of the strategies that have been used in Costa Rica for conservation have been “public protected areas management, designation of private conservation areas, reforestation

programs, watershed protection, scientific research, and standards of environmental sustainable performance applied to the hotel industry” (Sanchez, 2018, pp. 118-119). One of the successful programs for reforestation and conservation on private land is the financial incentive from the Payment for Environmental Services (PES) program established in 1996 (Howitt & Mason, 2018). The natural wonders of Costa Rica have become an essential part of the economy, bringing in more revenue since the early 1990s through ecotourism than through the top crop exports of bananas, pineapple, and coffee (Rodriguez, 2016; Sanchez, 2018). Therefore, Costa Rica’s prominence and success in the ecotourism industry makes it a useful country to evaluate how indicators of sustainability in ecotourism have been utilized in the assessment of ecotourism projects.



Figure 1 Map of Costa Rica showing ecotourism case study locations. Map elaborated using ArcGIS Pro.

Results: Assessing Ecotourism

Analysis of Ecotourism in Costa Rica

Many different indicators of sustainability were used in the eight Costa Rican case studies. Most addressed economics, local employment, and environmental impact—aspects within the three key pillars of ecotourism—but there was little use of indicator frameworks as proposed by Choi and Sirakaya (2006), Thomas et al. (2014), or Tsaur et al. (2006) in the case

studies. This section will analyze the case studies (see Appendix A for summary) and explain the selection of three as examples that used the proposed assessment criteria in Table 1.

Different types of ecotourism assessments in Costa Rica (Appendix A) included providing a list of sustainable practices; using sustainability indicators; analyzing the perceptions of residents via interviews; discussing the pros and cons of ecotourism in a specific location; and comparing sites to similar rural areas without ecotourism. Reviewing the case studies for important findings impacted the creation of the proposed assessment criteria.

From the La Fortuna case study (Matarrita-Cascante et al., 2010), it is evident that fostering community agency is an effective method of building the foundation for successful local communication and action (Table 1, 2a). Environmental sustainability came after the initial economic development of the area and arose out of the economic success of the town of La Fortuna. This shows that sustainability is not always a linear process, but should nevertheless be pursued, even if other steps are needed before focus can be placed on conservation.

All interviewees in Grandoca recognized that tourists bring economic benefits to the area (Table 1, 1b), but some respondents perceived the motivation behind the ecotourism enterprise to be based on the revenue generated by the project, not on the desire for environmental preservation (Gary & Campbell, 2009). In other places, tourism was also perceived to be linked to conservation only through economic benefits. In San Gerardo de Rivas, many men who transitioned from agricultural to mountain guide work saw the tourism trade as a better option because they could earn significantly more money, not because they were interested in environmental preservation (Howitt & Mason, 2018).

All of the case studies mentioned the employment of locals in their analysis (Table 1, 1b). In Grandoca, most of the staff and hosts working in ecotourism were from the local community while nature park guides were from other villages in Costa Rica (Gary & Campbell, 2009). In the Osa Peninsula locations of Drake Bay and Puerto Jiménez, there was a higher rate of employment of locals in the tourism industry in comparison to non-tourism jobs (Driscoll et al., 2011). Locals owned the majority of ecotourism businesses in La Fortuna as well (Matarrita-Cascante et al., 2010). In Talamanca, an organization called Asociación ANAI was largely responsible for helping promote sustainability in the ecotourism businesses in the region (Cusack & Dixon, 2008). This organization was able to facilitate connections between other local non-governmental organizations (NGOs) and community members as well as to develop training and educational programs for locals involved in ecotourism projects (Table 1, 2b) (Cusack & Dixon, 2008). This case in Talamanca showed a successful connection between a larger regional NGO and the local communities working together for sustainability promotion through ecotourism.

In most of the case study communities, environmental appreciation and conservation grew as a result of ecotourism ventures, but varied in the extent of conservation (Table 1, 3b). In San Gerardo de Rivas, it was noted that environmental practices such as recycling, composting, and greywater management were taking place in hotels and restaurants, but not in the nearby villages (Table 1, 3a) (Howitt & Mason, 2018). Many of the case study locations have experienced a shift from agriculture to ecotourism; with this shift in source of income, more and more natural areas were able to be reforested because they were not being cleared for agricultural purposes and because there was incentive to provide areas of natural beauty for tourists.

Reviewing the case studies revealed that there was not always a specific mention of each sustainability area: economic, social, and environmental (Table 1). Because of this, it is hard to know whether the aspect not mentioned in the reports was indeed assessed and found to be insignificant, or whether it was not part of the assessment. Three case studies (La Fortuna; San Gerardo de Rivas, Pérez Zeledón; and Talamanca—home of the Indigenous Bribri community) displayed the highest congruency between their assessment and the indicators in the proposed assessment criteria (Table 1). They are further discussed in the next section as examples of how to apply the proposed assessment criteria.

Applying the Proposed Assessment Criteria

The proposed assessment criteria (Table 1) are intended for initial evaluation work to make starting a sustainability assessment accessible to all ecotourism operators. Per the best practices recommended by the existing literature, the proposed sustainability indicators are not quantifiable, but instead require a qualitative approach. Multicriteria analysis using indicators in economics, opinions from locals and tourists, and ecosystem analysis are all options for the assessment of each criteria. Tsaour et al.'s (2006) selection of sustainability indicators used the Delphi technique which is “a unique method of eliciting and refining group judgment based on the rationale that a group of experts is better than (one) expert when exact knowledge is not available” (Tsaour et al., 2006, p. 645). The World Tourism Organization affirmed that nonquantifiable subjective sustainability indicators hold merit in the assessment of sustainability in tourism (Tsaour et al., 2006). Similar to the Delphi technique, one might use for assessment a consensus of multiple people, where community members are the experts on their enterprise. This is a subjective form of measurement, but by using input from many people, the outcome should be less biased.

After reviewing the eight case studies in the development of this new entry point to sustainability assessment criteria, it is evident that three studies show assessment (to some degree) of all of the proposed assessment criteria from Table 1. Through these three

“high congruence” case studies, examples of the assessment of the proposed criteria can be examined. Table 2 displays the three “high congruence” case studies (highlighted in green) and Table 3 displays the remaining case studies, “medium congruence” (highlighted in yellow) and “low congruence” (highlighted in red). Check marks indicate the criteria for which the case study “sufficiently mentioned” assessment comparable to the proposed criteria. A yellow triangle indicates that the criteria were only partially assessed using ideas similar to the proposed criteria (“mentioned to some extent”) and a brief explanation is given. An “X” indicates that the proposed assessment criteria were not discussed at all (“not mentioned”).

Table 2 Proposed Assessment Criteria in Case Studies – High Congruence

			Proposed Assessment Criteria					
			1. ECONOMIC		2. SOCIAL		3. ENVIRONMENTAL	
			a. Diversity in economic enterprises	b. Local employment and revenues kept in local community	a. Community communication and cohesion	b. Training and educational opportunities for locals	a. Long-term growth plan for waste and carrying capacity	b. Environmental appreciation and consciousness in locals and visitors
"High Congruence" Case Studies	1	Talamanca - indigenous BriBri community (Cusack & Dixon, 2008)	✓	✓	✓	✓	⚠ Carrying capacity not yet established, but mentioned	✓
	2	San Gerardo de Rivas, Pérez Zeledón (Howitt & Mason, 2018)	✓	✓	⚠ Community work on recycling project	✓	⚠ Waste management improvements, but no future plan	✓
	3	La Fortuna (Matarrita-Cascante et al., 2010)	✓	✓	✓	⚠ Mentions multiple school programs but nothing for adults	⚠ Established waste programs but no carrying capacity mentioned	✓

Key

Mentions of assessment of sustainability indicator:

✓ = Sufficiently mentioned

⚠ = Mentioned to some extent

✗ = Not mentioned

Table 3 Proposed Assessment Criteria in Case Studies – Medium and Low Congruence

		Proposed Assessment Criteria						
		1. ECONOMIC		2. SOCIAL		3. ENVIRONMENTAL		
		a. Diversity in economic enterprises	b. Local employment and revenues kept in local community	a. Community communication and cohesion	b. Training and educational opportunities for locals	a. Long-term growth plan for waste and carrying capacity	b. Environmental appreciation and consciousness in locals and visitors	
"Medium Congruence" Case Studies	4	Three Caribbean locations - Tortuguero, Cahuita, Yorquin (Sanchez, 2018)	✓	✓	✗	✗	⚠ Mentions lack of both waste water treatment plan and carrying capacity regulations	✓
	5	Grandoca (Gary & Campbell, 2009)	✗	⚠ A majority, but not 100%	✗	⚠ Stated benefits to the community; environmental education	⚠ Mentions opinions on development but no plan	✓
	6	Monteverde (Weinberg et al., 2002)	⚠ Mentions unemployment in low season	⚠ More people came into work because there was demand; non-local businesses also came in when it was shown to be a successful location	⚠ Ecotourism has brought less of a small community feel; district board was prohibited	✓	⚠ Mentions environmental problems from waste and pollution as well as problems of carrying capacity	✓
	7	Three Osa Peninsula locations - La Gamba, Drake Bay, Cerro de Oro (Stem, Lassoie, Lee, & Deshler, 2003; Stem, Lassoie, Lee, Deshler, & Schelhas, 2003)	⚠ Mentions how economy in Drake Bay is almost entirely dependent on tourism but is small portion in other two cities	✗	⚠ Regret for lost unity in Drake Bay	✓	⚠ Mentions problems of solid waste disposal	✓
"Low Congruence" Case Study	8	Osa Peninsula - Drake Bay and Puerto Jiménez (Driscoll et al., 2011)	✗	✓	✗	⚠ In-region increase	✗	⚠ Increase worth of nature in region

In all case studies, social factors and long-term growth plans were not assessed as frequently as environmental appreciation and economic aspects. Six of the eight case studies mentioned assessment of environmental appreciation and consciousness in locals and visitors sufficiently and the other two mentioned similar themes. None of the case studies assessed both of the social sustainability indicators, and only half assessed just one. This trend shows that there is a lack in social sustainability assessment, one of the three pillars of sustainability in ecotourism. Without assessment in all three areas there is not a complete picture of the sustainability of an enterprise.

Lessons From High Congruence Case Studies

The three “high congruence” case studies show how the proposed assessment criteria are important in the sustainability of ecotourism projects. These case studies are not only good examples of how the proposed indicators are key factors in the success of two of the ecotourism projects (Talamanca and La Fortuna), but they also show that unless the indicators

are achieved the ecotourism project is unsustainable in many ways (San Gerardo de Rivas, Pérez Zeledón).

Talamanca: the Indigenous Bribri Community

Through this case study (Cusack & Dixon, 2008) we learn that local communication and cohesion (Table 1, 2a) is an important factor in the success of an ecotourism project. Emphasis on local employment with descriptions of community members' various roles in tourists' experience; the ways in which revenue from the project was spread throughout the village; and economic diversification within the project show an excellent example of success in the two proposed economic indicators (Table 1, 1a, 1b). Community commitment to conservation has improved through participation in this ecotourism project and environmental education for visitors was included (Table 1, 3b). These environmental aspects show the significance of one of the proposed environmental indicators. As for social indicator 2b (Table 1, 2b), an NGO working in this region has helped with training and educational programs for locals. Overall, this ecotourism project has succeeded largely due to the successful adoption of all but one (Table 1, 3a) of the proposed criteria.

San Gerardo de Rivas, Pérez Zeledón

In comparison to the ecotourism project in Talamanca, the various ventures in San Gerardo de Rivas (Howitt & Mason, 2018) have not seen as much success in economic, social, or environmental sustainability, despite its assessment of most of the proposed criteria. The case study mentioned that the locals have learned environmental practices from tourists and that NGOs and government departments associated with Chirripó National Park have started environmental education in the area (Table 1, 2b, 3b). Overall, however, the local natural environment around the village does not greatly benefit from tourism and the locals are not fully on board with ecotourism. Assessment of ecotourism in this village using the proposed criteria showed that much improvement is needed for the projects to be sustainable.

La Fortuna

Strong local management and ownership (Table 1, 1b) is associated with much of La Fortuna's ecotourism success (Matarrita-Cascante et al., 2010). Additionally, there has been an emphasis on local cohesion, interaction, and participation, contributing to the success of La Fortuna (Table 1, 2a). Both of these indicators are present in the proposed criteria. The construction of a sewage and water treatment plant, establishment of recycling programs, and formation of zero carbon emission goals in hotels have shown the importance of waste management planning in the success of ecotourism projects (Table 1, 3a). La Fortuna residents acknowledged the importance of a diversified economy and the need to keep revenues in the

local community, both of which are proposed criteria that improved the local economy (Table 1, 1a, 1b). The tourism in La Fortuna has helped improve environmental consciousness and protection and has contributed to the addition of education programs in schools (Table 1, 3b, 2b). The success of ecotourism development in La Fortuna can be predominately attributed to these aspects mentioned, all present in the proposed criteria.

Conclusion

It is important to have a useful and accessible set of criteria as a framework for sustainability assessments. The framework proposed in this paper can be used to systematically assess the ecotourism industry in a given region as an entry point into the ongoing assessment process. Because ecotourism is a rapidly expanding development strategy for many communities, it is important to ensure that sustainability is achieved economically, socially, and environmentally. Critics might say that there are already more extensive lists of sustainability indicators available for widespread use, but those lists are not easily applicable. With a beginning to the ongoing assessment process that is simpler and more user-friendly, it will make the ecotourism industry more aware of certain key elements that contribute to economic, social, and environmental sustainability.

Because of the constraints of this assessment, I have not considered policies, laws, and regulations that govern states' tourism industries and sustainability practices. There are factors other than assessment systems that affect the sustainability of ecotourism, but being able to assess an enterprise independently from other factors could lead to more conscious efforts in social, economic, and environmental sustainability. The easy-to-understand assessment criteria proposed in this paper could also help small, emerging ecotourism businesses assess their own program right from the start rather than wait for an outside entity to do so after the venture's inception.

If a community is involved in ecotourism, it does not mean that it is successfully sustainable or even that it has potential to be so. It seems that many of the rural ecotourism enterprises in Costa Rica most likely lack the infrastructure and technological specialties needed for an abundance of tourists. Communicating with prospective visitors and answering their questions is important to making a specific rural location a desired destination. Internet appearance, accessibility, price, amenities, and the quality of service are all factors in visitor recommendations. Where there is minimal positive impact from tourism, often because of a lack of tourists, there is also minimal negative impact; however, if there are not enough tourists to make an enterprise successful economically, it will be hard for the community to focus on sustainability in the realm of environmental conservation. When communities are dependent on natural resources for their longevity, such as with ecotourism, there is more

incentive to preserve the environment. Howitt and Mason (2018) wrote that under these circumstances, “one can afford the luxury of looking at nature in a different way” (p. 76). However, there is not always a linear approach to sustainability. Full sustainability may be lacking at the beginning of an ecotourism enterprise (as mentioned in La Fortuna), but the goal of sustainability must be kept in sight.

Without using sustainability assessments to stay focused on the goal of ecotourism, precious ecosystems could be damaged by mismanaged tourist enterprises. It is more difficult to revert damaged ecosystems to their natural state than protect them from being damaged in the first place.

Further Research

More research is needed as to the effects and success of external assessment on ecotourism, as it impacts the sustainability of a specific ecotourism venture, or that of a broader region, in order to fully understand how these proposed criteria can be best used. It is unclear what happens to ecotourism assessments after they are conducted. More research is needed to see how improvements can be made after an assessment has shown the areas of need, and whether assessments are useful in affecting any governmental policy surrounding sustainability. Another area for continued investigation is exploring whether it is beneficial or functional for communities to assess their own enterprises using these provided indicators or if an assessment needs to be conducted by an outside party in order to be more objectively critical. This paper has provided a new set of entryway sustainability assessment criteria, but more research is needed to see whether, if used, it will have a real impact on increasing sustainable practices in ecotourism worldwide.

References

Choi, HC, & Sirakaya, E (2006). Sustainability indicators for managing community tourism. *Tourism Management*, 27(6), 1274-1289. <https://doi.org/10.1016/j.tourman.2005.05.018>

Cox, RS (2006). Ecotourism: Does it help or hurt fragile lands and cultures? *CQ Researcher*, 16(37), 865-888. <https://library.cqpress.com/cqresearcher/document.php?id=cqresrre2006102000>

Cusack, D, & Dixon, L (2006). Community-based ecotourism and sustainability: Cases in Bocas del Toro province, Panama and Talamanca, Costa Rica. *Journal of Sustainable Forestry*, 22(1), 157-182. doi:10.1300/J091v22n01_09

Driscoll, L, Hunt, C, Honey, M, & Durham, W (2011). La importancia del ecoturismo como una herramienta de conservación y desarrollo en la Península de Osa, Costa Rica [The importance of ecotourism as a conservation and development tool on the Osa Peninsula]. *Center for Responsible Travel (CREST)*. <https://www.responsibletravel.org/docs/Importance%20of%20Ecotourism%20Osa%20Peninsula%20-%20Spanish.pdf>

Howitt, J, & Mason, CW (2018). Ecotourism and sustainable rural development in Pérez Zeledón, Costa Rica. *The Journal of Rural and Community Development*, 13(1), 67-84.

ICT—Instituto Costarricense de Turismo [Costa Rica Tourism Board]. (n.d.). Retrieved May 15, 2020 from <https://www.ict.go.cr/es/>

Jones, S (2005). Community-based ecotourism: The significance of social capital. *Annals of Tourism Research*, 32(2), 303-324. <https://doi.org/10.1016/j.annals.2004.06.007>

Kiss, A (2004). Is community-based ecotourism a good use of biodiversity conservation funds? *Trends in Ecology & Evolution*, 19(5), 232-237. <https://doi.org/10.1016/j.tree.2004.03.010>

Lee, TH, & Jan, F (2018). Ecotourism behavior of nature-based tourists: An integrative framework. *Journal of Travel Research*, 57(6), 792- 810.

Matarrita-Cascante, D, Brennan, M, & Luloff, AE (2010). Community agency and sustainable tourism development: The case of La Fortuna, Costa Rica. *Journal of Sustainable Tourism*, 18(6), 735-756. <https://doi.org/10.1080/09669581003653526>

Mok, SC (2005). Turismo y ambiente: un potencial para el desarrollo económico para Costa Rica [Tourism and environment: a potential for the economic development of Costa Rica]. *Reflexiones*, 84(2), 25-37. <https://dialnet.unirioja.es/servlet/articulo?codigo=4796061>

Rodriguez, CM (2016, December 12). *To protect nature and boost economy, Cambodia must follow Costa Rica's lead*. Conservation.org. <https://www.conservation.org/blog/to-protect-nature-and-boost-economy-cambodia-must-follow-costa-ricas-lead>

Sanchez, RV (2018). Conservation strategies, protected areas, and ecotourism in Costa Rica. *The Journal of Park and Recreation Administration*, 36(3), 115-128. <https://doi.org/10.18666/JPra-2018-V36-I3-8355>

Stem, CJ, Lassoie, JP, Lee, DR, Deshler, DD, & Schelhas, JW (2003). Community participation in ecotourism benefits: The link to conservation practices and perspectives. *Society & Natural Resources*, 16(5), 387-413. <http://dx.doi.org/10.1080/08941920309177>

Stem, CJ, Lassoie, JP, Lee, DR, & Deshler, DJ (2003). How 'eco' is ecotourism? A comparative case study of ecotourism in Costa Rica. *Journal of Sustainable Tourism*, 11(4), 322-347. <https://doi.org/10.1080/09669580308667210>

Thomas, KD, Williams, NB, & Trotz, MA (2014). The sustainability of ecotourism activities: Development of an accessible, applicable, and efficient tool for assessment in the Caribbean region. *The West Indian Journal of Engineering*, 36(2), 51-62. https://sta.uwi.edu/eng/wije/vol3602_jan2014/documents/Manv36n2KThomasJan2014.pdf

Tsaur, S, Lin, Y, & Lin, J (2006). Evaluating ecotourism sustainability from the integrated perspective of resource, community and tourism. *Tourism Management*, 27(4), 640-653. <https://doi.org/10.1016/j.tourman.2005.02.006>

United Nations World Commission on Environment and Development (1987). *Report of the World Commission on Environment and Development: Our Common Future*. Oxford University Press. <http://www.un-documents.net/our-common-future.pdf>

Van Tassell, DH, & Daniel, SK (2006). The paradox of ecotourism in Costa Rica: Can economic development and environmental preservation co-exist? *Delaware Review of Latin American Studies*, 7(2). <https://udspace.udel.edu/handle/19716/19566>

Weinberg, A, Bellows, S, & Ekster, D (2002). Sustaining ecotourism: Insights and implications from two successful case studies. *Society & Natural Resources*, 15(4), 371-380. <https://doi.org/10.1080/089419202753570846>

Appendix A

Summary and Research Methods of the Eight Case Studies Analyzed

	Location	Authors of Case Study Report	Assessment Methods and Categories
1	Talamanca - indigenous BriBri community	Cusack & Dixon, 2008	a. Interviews and observations. b. Sustainability indicators in three categories: community organization, community & environment, and political.
2	San Gerardo de Rivas, Pérez Zeledón	Howitt & Mason, 2018	a. Surveys, interviews, and observation. b. Perspectives of sustainability, ecotourism, and agricultural production.
3	La Fortuna	Matarrita-Cascante et al., 2010	a. Interviews with key informants in the community and observations. b. Table of sustainable practices achieved in three categories: economic, social, and environmental.
4	Three Caribbean locations - Tortuguero, Cahuita, Yorkin	Sanchez, 2018	a. Interviews with three individuals, one from each location. b. Assessment of pros and cons in each location with no specific categories.
5	Grandoca	Gary & Campbell, 2009	a. Interviews with NGO staff, local hosts, and ecotourist volunteers. b. Comparison of aesthetic, economic, and ethical values between interviewees.
6	Monteverde	Weinberg et al., 2002	a. Interviews with owners and managers, workers, government officials, property owners, and community members. b. Ecological, economic, and social criteria for successful ecotourism.
7	Three Osa Peninsula locations - La Gamba, Drake Bay, Cerro de Oro	Stem, Lassoie, Lee, & Deshler, 2003; Stem, Lassoie, Lee, Deshler, & Schelhas, 2003	a. Interviews and surveys with residents and direct observation. b. Effects on conservation and community development.
8	Osa Peninsula - Drake Bay and Puerto Jiménez	Driscoll et al., 2011	a. Interviews with ecolodge employees and owners, tourists, and residents. c. Key findings in interviewee perceptions presented in seven categories.

Appendix B

Works for Further Reading

Brandon, K (1996, April). *Ecotourism and conservation: A review of key issues. Environment Department Papers, (33)*. <http://documents1.worldbank.org/curated/en/101351468767955325/pdf/multi-page.pdf>

Buckley, R. (2009). Evaluating the net effects of ecotourism on the environment: Framework, first assessment and future research. *Journal of Sustainable Tourism, 17(6)*, 643-672. <https://doi.org/10.1080/09669580902999188>

---. (2012). Sustainable tourism: Research and reality. *Annals of Tourism Research, 39(2)*, 528-546. <https://doi.org/10.1016/j.annals.2012.02.003>

Gray, NJ, & Campbell, LM (2007). A decommodified experience? Exploring aesthetic, economic and ethical values for volunteer ecotourism in Costa Rica. *Journal of Sustainable Tourism, 15(5)*, 463-482. <https://doi.org/10.2167/jost725.0>

Honey, M (2003). Giving a grade to Costa Rica's green tourism. *NACLA Report on the Americas, 36(6)*, 39-47. <https://doi.org/10.1080/10714839.2003.11724546>

Ko, TG (2005). Development of a tourism sustainability assessment procedure: A conceptual approach. *Tourism Management, 26(3)*, 431-445. <https://doi.org/10.1016/j.tourman.2003.12.003>

Beneficial Bacteria: How Misunderstood Organisms Can Promote Wound Repair in Chronic Subcutaneous Wounds

Molly Van Dyke '20, Biology

Faculty Mentor: Glenn Yasuda, PhD, Biology

Faculty Content Editor: Daniel Smith, PhD, Biology

Student Editor: Jollan Franco, English

Glossary

- **Apoptosis:** a controlled self-destruct mechanism within cells of the body that usually follows cellular damage; colloquially known as programmed cell death.
- **Biofilm:** blanket layer of one or more species of microorganisms, often adhered to a physical surface such as the skin.
- **Fibroblast:** creates an extracellular matrix to connect newly-formed epithelial cells in wound healing.
- **Keratinocyte:** layered within the epidermis and essential for innate immunity by providing barrier to the external environment. After skin injury, keratinocytes migrate to the wound and proliferate to repair the epithelial break. In chronic wounds, keratinocytes are dysregulated (Pastar, 2014).
- **Microbiota:** community of microorganisms of beneficial, neutral, or deleterious consequence to a multicellular host.
- **Microorganisms of Interest:**
- *Lactobacillus spp.* (*Lb. plantarum*, *Lb. rhamnosus*, *Lb. fermentum*, etc.): genus of bacteria that is naturally a part of the human microbiome, assisting in digestion and maintaining microenvironments such as vaginal acidity. *Lb. plantarum*, *Lb. rhamnosus*, and *Lb. fermentum* are examined as possible probiotics to facilitate the wound healing process.
- Pseudomonadaceae: family of bacteria to which *Pseudomonas aeruginosa* belongs.
- *Pseudomonas aeruginosa*: an opportunistic pathogen that can cause a multitude of dangerous infections
- *Staphylococci spp.* (*S. epidermis*, *S. aureus*, etc.): gram-positive cocci bacteria. Genus species range in detriment to the human body in that *S. epidermis* and *S. aureus* can be commensal, or beneficial, organisms typically found on the skin, whereas Methicillin-resistant *Staphylococcus aureus* (MRSA) is often responsible for a variety of hard-to-treat infections.
- *Streptococcus spp.* (*S. pyogenes*, *S. themophilus*, etc.): gram-positive cocci bacteria. Genus species are implicated in both human infections (*S. pyogenes*,) and as a possible topical treatment (*S. themophilus*).

Abstract

Chronic wound formation is an affliction that disproportionately affects those of lower socioeconomic status on a global scale due to a variety of contributing factors, like type 2 diabetes and housing environment (Fayne, 2020). Antibiotic use in response to a cutaneous wound selects for antibiotic-resistant bacteria, posing a risk for colonization by biofilm-forming species that can result in chronic wounds. Biofilms decrease future antibiotic use efficiency and inflames the surrounding tissue, potentially resulting in necrosis of the tissues. Current studies show the possibility for probiotic application or reintroduction of commensal organisms erased by antibiotic use as a therapeutic mechanism for cutaneous wounds. Here, a two-step cutaneous wound treatment protocol is proposed involving antibiotic use and subsequent bacteriotherapy as a preventative measure for chronic wound formation via antibiotic-resistant bacteria.

Introduction

Managing chronic wounds is a challenge around the world to individuals with limited access to healthcare. A 2017 analysis of the economic burden placed upon patients who were managing chronic wounds in the United States alone showed that approximately 5.7 million people accumulate an annual cost of at least \$20 billion (Järbrink 2017). In addition to the indefinite physical trauma of a chronic wound, economic and emotional trauma is experienced not only by patients, but also by their families. Individuals of lower socioeconomic status are more likely to experience medical conditions, such as type 2 diabetes or depression, that could exacerbate chronic wound development. Additionally, a patient's housing environment affects the healing rate of a chronic wound; for instance, a lack of central heating can significantly stunt wound repair (Fayne 2020). As these conditions disproportionately affect people in lower socioeconomic groups, who are often underinsured, the development of cost-effective treatment of chronic wounds is vital to the prevention of chronic wound-related emergencies, including amputation or even death (Järbrink 2017). Understanding wound physiology and the skin microbiome is foundational to curating bacterial-based therapeutics that could remedy chronic wounds.

Human bodies are covered with a vast and highly variable organ that is colloquially referred to as "skin." The expansive epithelial layer is embedded with different densities of sweat glands, oil glands, hair, and other mucus producers. Skin contains a wide range of viable ecosystems that can harbor different types of bacterial species. Sites with high sebaceous gland content contained a larger bacterial load than other regions of the skin, meaning that they contained a higher quantity of bacteria because of the moist, hospitable environment (Johnson 2018). Conversely, drier sites of the body often express more microbial diversity, or a wider variety of bacterial species (Grice 2009). Due to variations of both the body and the skin's environmental exposure, each human's skin surface contains unique microbial communities.

Depending on the host's external environment and the region of the body that is tested, up to two million bacteria can be isolated per square centimeter (Wong 2013). Although the same general bacterial species can be found in its preferred skin ecosystem, every volunteer in a 2009 study expressed different proportions of each species, suggesting that each individual contains a skin microbiota composition unique to them (Grice 2009). Dissimilarities between skin microbiota makeups can be attributed to the inherent differences of an individual host's diet, immunological capabilities, and degree of sebaceous secretion (Huffnagle 2013). Individual microbiota can be identified by a method known as 16S rRNA gene-based pyrosequencing, which identifies polymorphisms in the 16S gene that is present in all bacteria. This method maximizes bacterial diversity recognition, since

it identifies microorganism species missed through their lack of culture method compatibility (Price 2009; Huffnagle 2013). Distinguishing the presence of these unnoticed bacterial species on skin surfaces can contribute to understanding bacteria-wound interactions on the cutaneous surface.

Wounds can be defined as physical breaks in epithelial integrity together with the host's subsequent response to repair this break (Huffnagle 2013). Alterations in the cutaneous structure adjusts the physical and chemical parameters maintaining the composition of the skin microbiome; as a result, wounds reduce the production of mucus, change the construction of antimicrobial peptides, and also initiate an inflammatory response that ultimately causes recovery at the wound site (Huffnagle 2013). A typical uninfected wound response includes inflammation at the cutaneous break; this involves vasodilation and the recruitment of cells to facilitate healing. Inflammation addresses the elimination of foreign and potentially pathogenic microbes and their molecules via the migration of leukocytes, after which reparation of the wound begins via proliferation of cell types like fibroblasts (Jones 200). Although this mechanism is rapid for the sake of removing and excluding pathogenic bacteria from the exposed tissue, these processes can actually be inhibited by the presence of such pathogens. Subcutaneous tissue revealed via a wound in the cutaneous layer provides an uncolonized oasis for opportunistic pathogens that can disrupt the wound-healing process and stasis at the inflammatory stage; this is known as a chronic wound (Williams 2017).

The development of chronic wounds in patients is multifactorial and, ironically, can be due to the medical efforts to prevent infection in the first place. Understanding the microbiome of the skin can allow for specialized treatment that prevents chronic wound formation in patients, especially vulnerable populations such as low-income or elderly individuals (Price 2009). The skin, much like the gut, experiences high levels of exposure to the surrounding environment. Much of the research on the human microbiome has been centered on the populations present in the digestive tract. Fewer efforts have been made toward defining the cutaneous microbiome with 16S PCR only recently being used to better identify the microbes that were missed while using culture methods. There is little understanding of the overarching role of our skin microbiome, especially concerning wound healing promotion or inhibition (Johnson 2018). Wound management often relates to the prevention of infection. While the inherently negative impacts of our skin microbiome on wound repair have been assessed, significantly less work has been done on how our microbiota and non-commensal organisms could actually contribute to wound repair. Understanding wound microbiomes could allow us to manipulate their population proportions in order to best treat subcutaneous wounds.

In a medical scenario where multiple skin abrasions are being treated, a topical or oral antibiotic is often administered as a preventative measure against bacterial infection. However, use of antibiotics can favor the infection of antibiotic-resistant bacteria, leading to a

more severe and chronic infection of the cutaneous layer that could severely cost the patient financially, emotionally, and physically. This serious side effect of antibiotic use could be remedied using a topical application of various probiotics, such as *Lactobacillus plantarum*, that can out-compete pathogenic bacteria to promote wound healing.

Pharmaceutical Disruption of the Skin Microbiome Negatively Impacts Wound Closure

Typical Skin Microbiome Promotes Wound Healing

A 2011 study showed that keratinocytes in the skin are able to function normally in the presence of commensal, or advantageous, organisms inhabiting the microbiome (Wanke 2011). In fact, it was found that the skin microbiome is capable of amplifying the immune response against pathogenic bacteria. Commensal organisms promote the low-level expression of antimicrobial peptides, in order to prevent pathogenic bacterial growth on the skin. The study also revealed that commensal and pathogenic *Staphylococci spp.* are important in the development of antimicrobial peptides. Notably, the presence of pathogenic *S. aureus* on the skin causes a high level of antimicrobial peptide expression that is toxic to pathogenic but not commensal *S. epidermidis*, which have evolved protective mechanisms to those peptides. These findings are reinforced by similar studies that have found that *S. epidermidis* itself produces molecules that promote antimicrobial peptide production by keratinocytes (Lai 2010; Wong 2013). Wanke et al. builds upon that research by showing that *S. epidermidis* can simultaneously promote the efficient removal of pathogens while protecting itself.

Treatment-Induced Infection

Patients with wounds in the cutaneous layer are routinely administered a preventative dose of broad-spectrum antibiotics. If a chronic wound develops, antibiotic treatment is continued. In a study to examine the effects of treatment on the microbial community, researchers found that antibiotic use modifies bacterial communities instead of eliminating them (Price 2009). This case study found an increased Pseudomonadaceae colonization in wounds of patients that were recently treated with antibiotics, regardless of whether these antibiotics were expected to be effective against *Pseudomonas aeruginosa*. *P. aeruginosa* are known to grow planktonically, which means they do not have to bind themselves to a biofilm in order to live. However, these *P. aeruginosa* were eliminated after being introduced to antibiotics. Only biofilm-forming *P. aeruginosa* proved resistant to antibiotic treatment, providing an advantage in infecting a dermal surface. After antibiotic treatment in the hospital setting, bacterial diversity shifted dramatically to a *Pseudomonas*-dominated bacterial

composition. This selection for biofilm-producing bacteria suggests that immediate antibiotic use may contribute to formation of chronic wounds (Price 2009).

A recent study continued this work by testing the bacterial composition and wound healing of mice treated with vancomycin; ultimately, they found that there was a changed bacterial composition of the skin microbiota because of the antibiotic treatment (Zhang 2015). Decreased bacterial density and an adjustment in bacterial diversity was observed with both single-antibiotic treatment (vancomycin) and a combined antibiotic treatment (vancomycin, clindamycin, polymyxin). Measurement of the wound area five days after the wound was created showed that mice treated with antibiotics maintained a larger wound area than the control mice, suggesting that there is a correlation between antibiotic use and delayed wound healing (Zhang 2015).

Chronic Wound Development and Biofilm Formation

Antibiotic selection for biofilm-forming bacteria poses the possibility for the development of chronic wounds. *P. aeruginosa* and *Staphylococcus aureus* (*S. aureus*) are often responsible for the formation of such biofilms because of their resistance to antibiotics. When antibiotics wipe out a wound's microbial diversity and density, these pathogens then have more space to colonize. The existence of a biofilm creates an impenetrable defense for the infecting bacteria against immune cells, generating a state of chronic inflammation that in turn further damages the wounded tissue (Price 2009; Watters 2015). One study found that *P. aeruginosa* produces a lipid that traps bactericidal leukocytes and repurposes their lysed components like DNA and actin to further reinforce the biofilm (van Gennip 2012). The self-propagative nature of such infections contributes to the persistence of chronic wounds and their inability to heal, as the host's immune system cannot break down the biofilm of infecting bacteria (Price 2009). The presence of biofilms also decreases the ability of antibiotics to treat the infection, ultimately contributing to overuse of those antibiotics and subsequent development of antibiotic-resistant microbes, such as methicillin-resistant *Staphylococcus aureus* (MRSA) (Venosi 2019).

The pathogenesis of MRSA and its inhibition of human dermal fibroblasts from reconstructing the epidermis after a cutaneous wound was recently examined (Kirker 2012). This research revealed that dermal fibroblasts are responsible for excreting growth factors and creating extracellular matrix molecules, and are vital for repairing a break in the skin, which ultimately contributes to the natural reconstruction of the cutaneous layer (Kirker 2012). It was found that the introduction of biofilm-forming species such as MRSA prevent dermal fibroblast migration to the wound site and promote a programmed cell death of the fibroblasts called apoptosis. The presence of MRSA within a biofilm downregulates the production of cytokines, growth factors, and extracellular matrix-adjusting molecules such as protease, preventing

wound healing at multiple stages (Kirker 2012). Using these findings as a foundation, a 2015 study increased the number of biofilm-forming species that were studied to include *P. aeruginosa* (Marano 2015). More potent, denser biofilms that were typical of later-stage chronic wounds (caused by both *P. aeruginosa* and MRSA) proved highly toxic to human keratinocytes, which are involved in similar mechanisms to wound healing as dermal fibroblasts. As a result, proliferation and migration of these tissue-regenerative cells were inhibited. Early biofilms from both species affected the proliferative nature of keratinocytes through pathogen-secreted anti-host cell compounds, but minimal effects were seen on migration (Marano 2015).

Restoration of the Skin Microbiome through Medical Applications of Bacteria

Lactobacillus spp.

A variety of bacterial applications for repairing wounds are being explored as a means of avoiding the aforementioned issues with antibiotic use and the development of chronic wounds. A prominent study in this field discovered that topical administration of *Lactobacillus plantarum* *in vitro* and *in vivo* fully prevented the infection of *Pseudomonas aeruginosa*, which is a primary gram-negative perpetrator of biofilms that induces chronic wounds (Valdéz 2005). *Lb. plantarum* prevents the production of *P. aeruginosa* via the production of secondary metabolites that inhibit quorum-sensing molecules, which are important for later stage biofilm formation (Valdéz 2005). While *Lb. plantarum*'s production of lactic acid via metabolism inhibited *P. aeruginosa* growth, more inhibitory activity was seen as a result of *Lb. plantarum*'s occupation of physical space with no significant detrimental effect to the host. Similarly, treatment of a *P. aeruginosa* colonization induced tissue phagocytes to phagocytose, or to engulf, *P. aeruginosa* and the *Lb. plantarum* used in the treatment. Consequentially, this decreased pathogenic bacterial counts and promoted tissue repair (Valdéz 2005). Bacterial therapies decreased premature tissue cell death (necrosis) and concentrations of inflammatory molecules in wound sites. Although this research did not see a decrease in overall healing time of the wound, the topical application of the bacterial therapy enabled the body to prevent biofilm formation at wound sites (Valdéz 2005).

A 2014 study expanded upon this procedure, aiming to determine the effects of a wider variety of *Lactobacillus* species on *S. aureus* biofilm formation. An analysis of the topical application of live *Lb. rhamnosus* found that regardless of the time administered in relation to the point of wound infliction, keratinocytes that were present at the wound site were protected from *S. aureus*-induced apoptosis (Mohammedsaeed 2014). It was determined that the likely cause of this protection is the prevention of *S. aureus* growth and adhesion, as seen by the

reduction in *S. aureus* bacterial count. A similar study confirmed *Lb. plantarum*'s ability to physically prevent *P. aeruginosa* in burn wounds by displacing *P. aeruginosa* from the tissue and physically occupying the space instead (Argenta 2016). This study also showed that topical application of *Lb. plantarum* prevented pathogenic spread from the wound to distant organ systems, thus preventing sepsis (Argenta 2016).

An earlier study showed that *Lb. plantarum* topical application shows greater efficacy in the treatment of infected third-degree burns than the conventional microbicidal agent, silver sulphadiazine, which can produce adverse reactions and side effects in cutaneous burn wounds, calling for alternative treatments to be pursued (Peral 2009). These infections include *P. aeruginosa*, similar to the Valdéz study, but also encompass *S. aureus* and *Streptococcus pyogenes*. Overall, *Lb. plantarum* decreases the bacterial load and allows for the cutaneous wound to repair itself (Lukic 2017). The mechanism behind this pathogenic bacteria removal was proposed to include *Lb. plantarum* stimulation of immune system components previously inhibited by *P. aeruginosa* (Hessle 2000). Although not explicitly stated in Peral et al.'s 2009 examination of *Lb. plantarum* inhibition of biofilm formation, the aforementioned cytokine release and response could ultimately be responsible for the breakdown of the biofilm and thus phagocytosis of pathogenic bacteria (Mohammedsaeed 2014).

The most recent notable application of these findings expanded upon the prior studies by testing topical application and injection of probiotics on or near wound sites (Fijan 2019). The study used a variety of cutaneous wound types, including both burn and cut wounds, and found that probiotics maintain an antagonistic effect against wound pathogens, primarily *S. aureus* and *P. aeruginosa*. The probiotics used included *Lb. plantarum*, *Lb. fermentum*, and *Cutibacterium acnes*, all of which showed wound healing effects or inhibition of pathogenic progress (Fijan 2019).

***Staphylococcus Epidermis* and Friends**

Infection of cutaneous wounds by *Staphylococcus aureus* has also been shown as treatable via the application of other bacterial species. *Staphylococcus epidermis*, a skin commensal organism, was shown in Sugimoto et al. to produce Esp, a protease that prevents and deconstructs biofilms created by *S. aureus* (Sugimoto 2013). This is also an effective method against *S. aureus* strains that are methicillin- and vancomycin-resistant as Esp degrades a variety of biofilm-associated surface proteins on *S. aureus* (Hessle 2000). By degrading the biofilm extracellular matrix and destruction of proteins responsible for *S. aureus* attachment and infection, host immune cells can attack pathogenic bacteria and prevent or eliminate wound infection (Peral 2009). Similarly, another study showed that *Staphylococcus spp.* can prevent prolonged, damaging inflammation in the cutaneous layer; *S. epidermis* secretes triggers for keratinocytes to produce antimicrobial peptides (Wong 2013).

A recent study assessed a clinical case of a patient with an infected chronic ischemic wound—a wound caused by stunted blood supply to the tissue—that sustained a polymicrobial infection with pathogenic bacteria *Klebsiella pneumoniae*, *Enterococcus faecalis* and *Proteus mirabilis*, which worsened after continued use of antibiotics (Venosi 2019). The prolonged infection began to show signs of wound recovery after a topical probiotic application of *Lactobacillus plantarum*, *Lactobacillus acidophilus*, and *Streptococcus thermophilus*. Those metabolites which are often associated with promotion of bacterial infection were altered, and this result could be associated with wound recovery. For example, polyamine putrescine was reduced after the application of probiotic treatment. Polyamine putrescine is involved with bacterial growth, biofilm formation, and protection from stress enacted by the immune system (Venosi 2019).

Synthesis and Conclusions

Infection of cutaneous wound trauma is a common and justified fear within the medical profession because of the possibility for sepsis or chronic wounds. However, in spite of the negative association between bacteria and physical trauma, there are aspects of our microbiome that contribute to the body's ability to repair wounds. Disruption of microbiome inhibits specific immune responses mediated by the microbiome. Similarly, broad-spectrum antibiotics that are selected for antibiotic-resistant bacteria are commonly responsible for the formation of biofilms. As shown by the aforementioned studies, commensal organisms can be involved in inducing antimicrobial peptides that eliminate the presence of pathogenic bacteria, but are also not toxic to the commensals due to evolved protection mechanisms (Lai 2010; Wanke 2011). Given that commensal organisms then modulate the microbiome and prevent regular infection of pathogenic bacteria, researchers should question the impact of immediate use of broad-spectrum antibiotics on the skin microbiome.

Broad-spectrum antibiotic use can select for antibiotic-resistant species responsible for biofilm production, such as *P. aeruginosa* and *S. aureus*, that ultimately colonize the wound and can induce the formation of chronic wounds (Price 2009). The removal of competing organisms allows the pathogenic bacteria to flourish and colonize the wound without restriction by resource limitation. Although the rationale for preventative antibiotic use is evident, the broad-spectrum nature of such use eliminates repair-promoting organisms that would not colonize regions of the wound successfully. To further evidence this point: it was found that antibiotic use could be associated with delayed wound healing; pure antibiotic use removes healing organisms and instead opens the gates for opportunistic pathogens to infect, colonize, and form biofilms over fresh cutaneous wounds (Zhang 2015). The infection enabled by antibiotic use and consequent biofilm formation limits the ability of the wound to repair itself, and the

presence of such biofilm-forming pathogens decrease migration of dermal fibroblasts to the wound site (Kirker 2012). This also decreases the production of molecules and compounds involved with dermal repair (van Gennip 2012; Marano 2015). This begs the question: to what degree is the removal of commensal organisms in addition to pathogenic bacteria beneficial for the repair of burn or cut wounds on the skin? Increased risk of chronic wound formation and reduced wound healing due to the use of broad-spectrum antibiotic suggests that antibiotic use needs to be supplemented with another therapeutic that inhibits biofilm growth.

The use of probiotics and reapplication of commensal bacteria lost through antibiotic exposure has been shown to promote wound repair. Probiotic use (*Lb. plantarum*) was shown to fully prevent infection of *P. aeruginosa* by inhibiting the species' biofilm production, leaving them exposed to immune cells (Valdéz 2005). In addition to acting as a preventative bacteriotherapeutic, *Lb. plantarum* can be applied in late-stage biofilm formation through the production of molecules that prevent bacterial communication in biofilms. That late-stage application also prohibits the spread of harmful bacteria to adjacent sites and distant organs (Peral 2009). Probiotics can be applied as an effective therapy against *P. aeruginosa* at any stage in chronic wound formation, resulting in pathogenic cell death and lower concentrations of inflammatory molecules (Valdéz 2005). Similar effects can be seen with *Lb. rhamnosus* in their prevention of *S. aureus*-induced keratinocyte cell death while also reducing pathogenic bacterial cell count (Mohammedsaeed 2014). More recent studies have shown that even more bacterial species can be used to promote wound healing (for example, *Lb. fermentum* and *Propionibacterium acnes*), which can open the possibility of more diversity in bacteriotherapy in the coming years (Fijan 2019).

Lb. plantarum (and potentially other species) out-competes pathogenic bacteria and creates a wound environment that is uninhabitable for organisms responsible for biofilm formation. As such, *Lb. plantarum* can be used as a means for inhabiting a wound space as a protection against harmful bacteria without inducing a chronic wound. The probiotics can eliminate pathogenic bacteria responsible for maintaining a chronic wound before the probiotics themselves are removed with treatments or the body's natural immune response. Probiotics can also be used as a shield against biofilm formation. Peral et al. also showed that infected third-degree burns treated with *Lb. plantarum* show a greater healing rate than classical treatments, posing the possibility that an additive step in conventional cutaneous trauma treatment will ultimately promote healing and further prevent chronic wound formation (Peral 2009). Potentially, a wide variety of *Lactobacillus* strains can be utilized for therapeutic purposes, as the aforementioned strain also had a positive effect on wound healing regardless of the stage of biofilm formation when it was applied.

In addition to probiotic application, there is a possibility for restoration of the patient's commensal organisms responsible for maintaining a biofilm-free wound site. *S. epidermis* was

found to produce a protease that reduces and prevents biofilms caused by *S. aureus* (Sugimoto 2013). This aligns with prior findings that *S. epidermis* is responsible for a specialized immune response, and that the elimination of the species from a wound site could delay wound healing because of this alteration in strain-strain interaction. The reduction of *S. epidermis* load at a wound site decreased the ability of the skin microbiota to prevent biofilm-forming and antibiotic-resistant *S. aureus* from colonizing the site and inducing necrosis of the surrounding tissues (Hessle 2000; Zhang, 2015).

While there are numerous benefits to utilizing probiotics in wound care and management, there are notable risks, as well. A common understanding of bacteria includes the broad generalization that all bacterial species, except those supporting our digestion, pose a risk to human health. Many studies point out the human concern that topical application of any probiotic to a cutaneous wound increases risk of septicemia, or bacterial infection of the blood (Mohammedsaeed 2014; Watters 2015). And, indeed, there is a possibility that *Lactobacillus* septicemia is more likely in immunocompromised individuals; a retroactive study conducted found that *Lb. rhamnosus* bacteremia was found in 66% of immunosuppressed patients, and 82.5% of catheterized patients, which increases the risk for consequential septicemia (Gouriet 2012). If practitioners increase probiotic use in these cases, there is also a parallel increased risk for cases of septicemia.

Although there is a reasonable concern for septicemia in individuals particularly vulnerable to infection, it can be considered that the risk of septicemia is lower than the risk posed by chronic wounds, where the degree of inflammation is so damaging that it prevents any ability to fight infection by physically retaining immune cells and also by promoting further tissue destruction (Valdéz 2005). A topical application of *Lb. plantarum* can then inhibit the exacerbated immune system to biofilm-forming bacteria in chronic wounds. Current wound management techniques are based on reducing bacterial load and preventing infection, but harsh antimicrobial protocols can negatively impact the bacterial species composition of the wound environment to ironically favor infection (Price 2009). Adjusting our approach to wound healing in order to permit a two-step method of antibiotic and subsequent probiotic application (as shown in Figure 1) can prevent the formation of chronic wounds. Three stages of wound healing are indicated. Figure 1A shows a fresh cutaneous wound has antibiotics topically applied, and Figure 1B shows a subsequent response where antibiotic-resistant bacteria begin early stages of biofilm formation. It is at this point that a probiotic bacteriotherapy is applied, the effect of which is shown in Figure 1C, where the biofilm is deconstructed by the probiotic and regenerative cells are able to begin re-epithelialization.

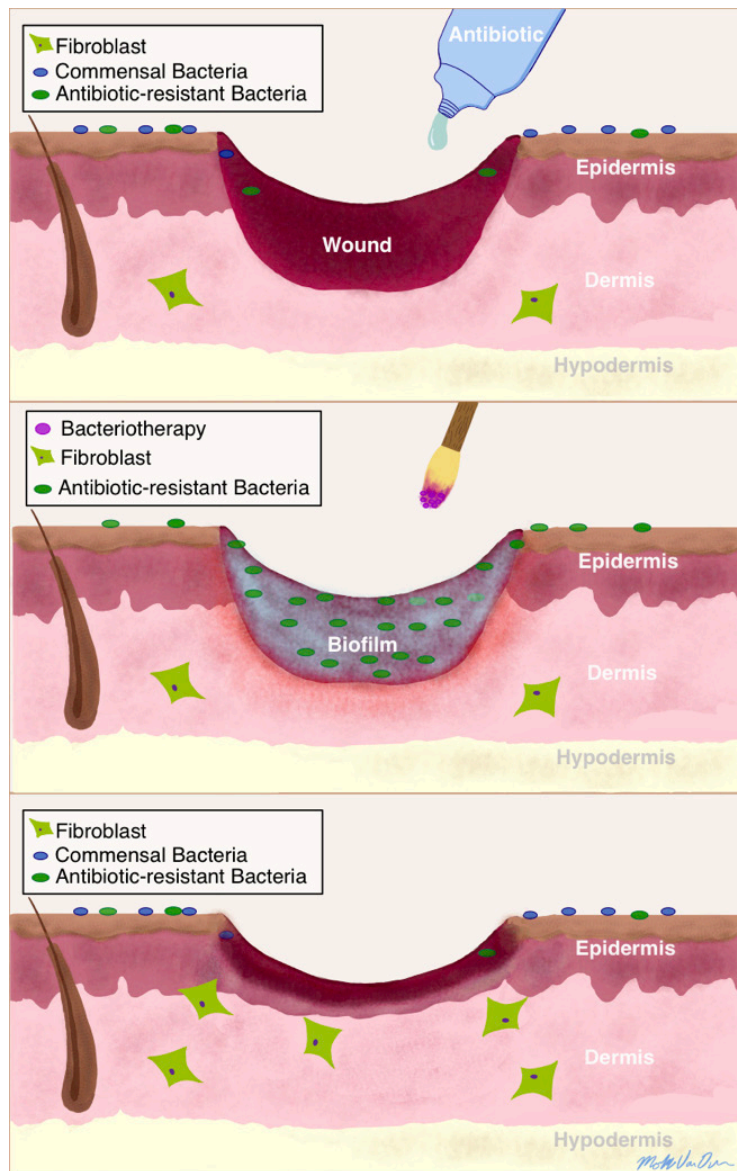


Figure 1 Proposed standard protocol for cutaneous wound management in the prevention of chronic wound formation.

Manipulation of the wound ecosystem with probiotics acts as a cost-effective alternative treatment that subverts the cost of continued antibiotic use and the healthcare that comes with chronic wound management (Johnson 2018). This would reduce the annual billions of dollars spent on chronic wounds as well as decelerate the development of antibiotic-resistance due to futile attempts at diminishing chronic wounds via chronic antibiotic administration. Easily culturable bacteria as a therapy can promote infection management for patients with income limitations, paving the way for access to more diverse healthcare methods.

As has been stated, chronic wounds disproportionately affect people in lower

socioeconomic conditions. For example, individuals in lower socioeconomic groups are more likely to develop a chronic wound, and individuals who are unemployed were found to be 2.44 times more likely to develop a chronic wound than their employed counterparts (Yao 2020). Taking together the duration of chronic wounds, the increased chronic wound development rate, and the decreased recovery rate from chronic wounds experienced by lower- or no-income individuals, a statistic emerges that unemployed patients are 12.34 times more likely to be afflicted with a chronic wound than unemployed individuals (Yao 2020). Low-income individuals are also more likely to have decreased or stunted healing due to conditions that are directly related to their income and resources and thus out of their control. The increased stress of economic burden leads to an increase in stress hormones, impairing wound repair (Fayne 2020). Nutritional deficiencies, housing security and quality, marital status, and a wide range of impacts from economic hardship also extend the lifespan of a chronic wound (Fayne 2020). In summary, those in lower socioeconomic groups carry the burden of chronic wounds more than people with access to economic success.

Chronic wounds make up a large percentage of annual healthcare expenses around the world. In addition to the above 2017 US analysis stating that an annual cost of \$20 billion in healthcare expenses is accrued nationally because of chronic wounds, a study of Northern China from the same year showed that annual hospital costs for a single patient treating chronic wounds amounted to around US \$1,271,000 (Yao 2020). Chronic wound patients in Northern China contribute to 3.18% of all of healthcare expenses in 2017 (Yao 2020). On a global scale, lower-income individuals disproportionately carry the burden of chronic wound affliction, and as a result, they also make up the bulk of these medical expenditures. In the study that evaluated Northern China's chronic wound healthcare expenses, it was found that more than 10% of chronic wound patients, including those experiencing diabetes, infection, pressure ulcers, or even surgery, had to pay for their own medical bills (Yao 2020). The development of more cost-effective and accessible treatments will relieve the burden of these medical expenses, allowing those who are affected at a higher rate to receive the care they need without fear of further economic burden. By standardizing a method of care that will decrease further psychosocial strain, which would further impact wound repair, the cost of wound management could be reduced up to 30% (Järbrink 2017). Probiotic bacteriotherapy holds promise in providing reduced-cost treatment. Accepting the use of beneficial bacteria in the treatment of chronic wound patients may not only relieve the physical, psychological, and familial detriments caused by chronic wounds, but could also mark a broader transition to treatments that go beyond expense.

Preventative measures against chronic wound formation would ensure that the wound environment remains inhospitable to the pathogens remaining after antibiotic exposure, reducing not just inflammation but the negative psychological and physical effects associated

with a chronic wound. Adjusting our approach to wound healing will eventually benefit patients, utilizing an existing organism to decrease wound pH, reduce inflammation at the wound site, and inhibit further infection by pathogenic bacteria (Johnson 2018). While further research should investigate the susceptibility of immunocompromised individuals to septicemia due to topical application of live probiotics as opposed to their antimicrobial byproducts, the current data proposes positive effects of bacterial application as a disruptive and preventative ward against chronic wounds. Ultimately, disrupting our current paradigm regarding bacteria can pave the way for a new wave of bacteriotherapy in healthcare.

References

- Argenta A, Satish L, Gallo P, Liu F, Kathju S. 2016. Local application of probiotic bacteria prophylaxes against sepsis and death resulting from burn wound infection. *PLoS One*, 11(10), e0165294. doi:10.1371/journal.pone.0165294.
- Fayne RA et al. 2020. The potential impact of social genomics on wound healing. *Advances in wound care*. 9(6): 325-331. doi:10.1089/wound.2019.1095.
- Fijan S, Frauwallner A, Langerholc T, Krebs B, Ter Haar Née Younes J A, Heschl A... Rogelj I. 2019. Efficacy of using probiotics with antagonistic activity against pathogens of wound infections: an integrative review of literature. *BioMed Res Intl*. 7585486. doi:10.1155/2019/7585486.
- Gouriet F, Million M, Henri M, Fournier P, Raoult D. 2012. *Lactobacillus rhamnosus* bacteremia: an emerging clinical entity. *Eur J Clin Microbiol Infect Dis* 31: 2469–2480. <https://doi.org/10.1007/s10096-012-1599-5>.
- Grice E A, Kong HH, Conlan S, Deming CB, Davis J, Young AC...Segre JA. 2009. Topographical and temporal diversity of the human skin microbiome. *Science*, 324(5931): 1190–1192. doi:10.1126/science.1171700.
- Hessle C, Andersson, B, Wold AE. 2000. Gram-positive bacteria are potent inducers of monocyte interleukin-12 (IL-12) while gram-negative bacteria preferentially stimulate IL-10 production. *Infection and Immunity*, 68(6): 3581–3586. doi:10.1128/iai.68.6.3581-3586.2000.

Huffnagle, Gary B., Scales, Brittan S, & Huffnagle, Gary B. 2013. The microbiome in wound repair and tissue fibrosis. *The Journal of Pathology*. 229(2): 323-331.

Järbrink K, Ni G, Sönnergren H, Schmidtchen A, Pang C, Bajpai R, Car J. 2017. The humanistic and economic burden of chronic wounds: a protocol for a systematic review. *Systematic Reviews*, 6(1): 15. doi:10.1186/s13643-016-0400-8.

Johnson TR, Gómez BI, McIntyre MK, Dubick MA, Christy RJ, Nicholson SE, Burmeister DM. 2018. The cutaneous microbiome and wounds: new molecular targets to promote wound healing. *Int Jo Mol Sci*, 19(9): 2699. doi:10.3390/ijms19092699.

Jones SG, Edwards R, Thomas DW. Inflammation and wound healing: the role of bacteria in the immuno-regulation of wound healing. 2004. *Int Jo Lower Extrem Wounds*. 3(4): 201–208. <https://doi.org/10.1177/1534734604271810>.

Kirker KR, James GA, Fleckman P, Olerud JE, Stewart PS. 2012, Differential effects of planktonic and biofilm MRSA on human fibroblasts. *Wound Repair and Regeneration: Official Publication of the Wound Healing Society [and] the European Tissue Repair Society*. 20(2): 253–261. doi:10.1111/j.1524-475X.2012.00769.

Lai Y, Cogen AL, Radek KA, Park HJ, Macleod DT, Leichtle A...Gallo RL. 2010. Activation of TLR2 by a small molecule produced by *Staphylococcus epidermidis* increases antimicrobial defense against bacterial skin infections. *Jo investigative Derm*. 130(9): 2211–2221. doi:10.1038/jid.2010.123.

Lukic J, Chen V, Strahinic I, Begovic J, Lev-Tov H, Davis SC...Pastar I. 2017. Probiotics or pro-healers: the role of beneficial bacteria in tissue repair. *Wound Repair and Regeneration: Official Publication of the Wound Healing Society [and] the European Tissue Repair Society*. 25(6): 912–922. doi:10.1111/wrr.12607.

Marano JR, Wallace HJ, Wijeratne D, Fear MW, San Wong H, O’Handley R. 2015. Secreted biofilm factors adversely affect cellular wound healing responses in vitro. *Scientific Reports* 5: 13296. doi:10.1038/srep13296.

Mohammedsaeed W, McBain AJ, Cruickshank SM, O’Neill CA. 2014. *Lactobacillus rhamnosus* GG inhibits the toxic effects of *Staphylococcus aureus* on epidermal keratinocytes. *Appl Envir Microb*, 80(18): 5773–5781. doi:10.1128/AEM.00861-14.

Pastar, I et al. Epithelialization in wound healing: a comprehensive review. 2014. *Advances in Wound Care* 3(7): 445-464. doi:10.1089/wound.2013.0473.

Peral MC, Huaman Martinez MA, Valdez JC. 2009 Bacteriotherapy with *Lactobacillus plantarum* in burns. *International Wound Journal* 6: 73-81. 2009. doi:10.1111/j.1742-481X.2008.00577.x.

Price LB, Liu CM, Melendez JH, Frankel YM, Engelthaler D, Aziz M...Zenilman JM. 2009. Community analysis of chronic wound bacteria using 16S rRNA gene-based pyrosequencing: impact of diabetes and antibiotics on chronic wound microbiota. *PloS One*. 4(7): e6462. doi:10.1371/journal.pone.0006462.

Sugimoto S, Iwamoto T, Takada K, Okuda K, Tajima A, Iwase T, Mizunoe Y. 2013. *Staphylococcus epidermidis* Esp degrades specific proteins associated with *Staphylococcus aureus* biofilm formation and host-pathogen interaction. *Jo Bacter*, 195(8): 1645–1655. doi:10.1128/JB.01672-12.

Valdéz JC, Peral MC, Rachid M, Santana M, Perdigón G. 2005. Interference of *Lactobacillus plantarum* with *Pseudomonas aeruginosa* in vitro and in infected burns: the potential use of probiotics in wound treatment. *Clin Microbiol Infect*. 11(6): 472-9. doi: 10.1111/j.1469-0691.2005.01142.x. PMID: 15882197.

van Gennip M, Christensen LD, Alhede M, Qvortrup K, Jensen PØ, Høiby N... Bjarnsholt T. 2012. Interactions between polymorphonuclear leukocytes and *Pseudomonas aeruginosa* biofilms on silicone implants in vivo. *Infection and Immunity*, 80(8): 2601–2607. 2012. doi:10.1128/IAI.06215-11.

Venosi S, Ceccarelli G, de Angelis M, Laghi L, Bianchi L, Martinelli O, Maruca D, Cavallari E, Toscanella F, Vassalini P, Trinchieri V, Oliva A, D’Ettorre G. 2019. Infected chronic ischemic wound topically treated with a multi-strain probiotic formulation: a novel tailored treatment strategy. *Jo Translational Med*. 17: 10.1186/s12967-019-2111-0.

Wanke I, Steffen H, Christ C, Krismer B, Götz F, Peschel A, Schaller M, Schitteck B. 2011. Skin commensals amplify the innate immune response to pathogens by activation of distinct signaling pathways. *Jo Investig Derm*. 131(2): 382-390.

Watters C, Yuan T, Rumbaugh K. 2015. Beneficial and deleterious bacterial–host interactions in chronic wound pathophysiology. *Chron Wound Care Mgt Res*, 2: 53–62.

Williams H, et al. 2017. Cutaneous Nod2 expression regulates the skin microbiome and wound healing in a murine model. *Jo Investigative Derm.* 137(11): 2427–2436. doi:10.1016/j.jid.2017.05.029.

Wong VW, Martindale RG, Longaker MT, Gurtner GC. 2013. From germ theory to germ therapy: skin microbiota, chronic wounds, and probiotics. *Plastic and Reconstructive Surgery.* 132(5): 854e-861e. Special Topics.

Yao Z, Niu J, Cheng B. 2020. Prevalence of chronic skin wounds and their risk factors in an inpatient hospital setting in Northern China. *Advances in Skin & Wound Care.* 33(9): 1-10. doi: 10.1097/01.ASW.0000694164.34068.82.

Zhang M, Jiang Z, Li D, Jiang D, Wu Y, Ren H...Lai Y. 2015. Oral antibiotic treatment induces skin microbiota dysbiosis and influences wound healing. *Microbial Ecology.* 69(2): 415-421. Retrieved January 13, 2020, from www.jstor.org/stable/24542462

The Manifestation of Total War in the Mexican Revolution

Craig Verniest, History and Spanish

Faculty Mentor: Tom Taylor, PhD, History

**Faculty Content Editor: Nova Robinson, PhD,
International Studies and History**

Student Editor: Emma Hyman, English

Abstract

This manuscript examines the manifestation of total war in the Mexican Revolution and analyzes why such an extreme form of warfare occurred. "Total war" refers to a mass armed conflict that is unrestricted in the weapons used, the territory or combatants involved, and the objectives pursued, as well as involving the complete mobilization of civilian and military resources for the war effort. In the Mexican Revolution, this was expressed in three main aspects: the implementation of excessive force by and against combatants, the perpetration of extreme violence, whether intentionally or unintentionally, against non-combatants, and the appropriation of civilian resources, which damaged civilian livelihood and threatened resource supplies. The essay cites specific examples of these aspects of total war, including the use of chemical warfare, the deliberate murder of civilians by combatants, and the pillaging of civilian property. In analyzing various incidents of the Mexican Revolution, the author determines that there are several reasons for the manifestation of total war. These include the use of heavy weaponry, brutal military tactics, the extended duration of the revolution, and the ideological differences between revolutionary factions.

Introduction

La Decena Trágica, or the “Ten Tragic Days,” was a period of extreme violence and wanton destruction that occurred in México City between 9 February and 19 February 1913. This event occurred in the midst of the broader seven-year armed conflict of the Mexican Revolution, specifically during the military coup instigated by counterrevolutionary forces intending to overthrow the reformist-minded government of Francisco I. Madero, leader of the populist revolt in 1910, and then elected president in 1911. As described by a *New York Times* article from 12 February 1913, which covered the third day of violence, “Fleeing citizens cut down. For hours big guns and rapid fires sweep streets of the capital. Witness of the fighting says bodies cover streets where fighting occurred. Shells wreck big buildings [...] The food supply in the capital is low. There is no milk or bread to be obtained, owing to the military activity in the city and the outskirts” (“Madero Spurns Offer” 1).

The events depicted in this article provide perfect examples of “total war” in the Mexican Revolution, a conflict not hitherto described in terms of total war proportions. “Total war” refers to a mass armed conflict that is “unrestricted in the weapons used, the territory or combatants involved, or the objectives pursued” (“Total War,” *Oxford References*) as well as involving the “complete mobilization of civilian and military resources and manpower [*sic*] for the war effort” (“Total War,” *Encyclopedia Britannica*). I describe the manifestation of total war in the Mexican Revolution through three main aspects: the utilization of extreme and unnecessary violence by and against combatants; the perpetration of violence—whether intentional or unintentional—against non-combatants; and the involvement or appropriation of the civilian resource supply for the war effort and the resulting toll it took on resources and civilians.

This analysis will show that the Mexican Revolution should be conceptualized of in terms of its use of total war practices, and therefore provoke larger debates on the historiography of total war and its relation to revolutionary conflicts. World War I has traditionally been conceived of as the first mass armed conflict(s) to constitute total war, largely due to the mobilization of multiple global civilian economies and means of production for the war effort; the extremely high number of casualties inflicted upon both military forces and civilian non-combatants; the use of weapons and strategies intended to exact as much damage as possible upon the opposing force; and the worldwide scale of the conflict of World War I. However, while the Mexican Revolution was not an armed conflict on the *scale* of World War I, I argue that it constitutes an early conflict of total war *proportions*. It shares similar elements of warfare with that war: especially the level of violence enacted on both combatants and non-combatants (between one and two million deaths have been attributed to the direct and indirect damage of the Mexican Revolution), and the appropriation of civilian resources by belligerent forces. I was prompted to ask why the historiography of World War

I has traditionally emphasized the implementation of total war, while that of the Mexican Revolution rarely, if ever, has done so. While this comparison exceeds the constraints of this paper, I hope to establish future opportunities of this kind.

Background

The Hague Convention

The international Hague Convention of 1907 meant to define “the laws and customs of war on land” and bind all signatory nations to adhere to its code of conduct (*Hague*; ch. 4, art. 1). The Hague Convention of 1907 revised the earlier 1899 First Hague Peace Conference, which itself had been used to amend the laws and customs of war established by the Conference of Brussels in 1874 (*International Committee of the Red Cross*). Given that the Mexican Revolution began only three years after the Convention was signed, it became one of the first conflicts in which articles were applied; but the war also exemplifies challenges to the Convention its rules on just warfare. As will be seen, The Hague Convention articles did very little to prevent unjust actions as intended.

Articles One and Two of the Convention define which persons could be considered combatants, stating that if either militia or volunteer corps constituted forces of an army, then they were defined as combatants (*Hague*; ch. 4, art. 1). Additionally, if inhabitants of a territory armed themselves to protect against an invading force, they were considered belligerents (*Hague*; ch. 4, art. 2). Many of the forces in the Mexican Revolution were more or less unofficial armies, and some were composed mainly of conscripted men with little or no official military training. However, both cases provided above by The Hague Convention determine these men to be combatants: either they were considered part of “volunteer” or militia forces and thereby part of official armies, or if they had joined the conflict to protect their homes and families, they were considered active combatants. Therefore, both the federal and the various revolutionary forces in the Mexican Revolution were considered combatants in all cases.

The Hague Convention also defined certain methods of warfare as illegal and unjust, and defined them as actions of total war. These methods included “treacherously” killing or wounding opposing combatants; killing or wounding combatants who have surrendered; using “arms, projectiles, or material calculated to cause unnecessary suffering”; and the “destruction or seizure of the enemy’s property” (*Hague*; ch. 4, art. 23). Although what constitutes “treacherous wounding” or “unnecessary suffering” was not specifically defined, there were numerous instances in the Mexican Revolution in which one or more methods of excessive violence occurred. Articles 25, 28, and 46 state that “attacks and bombardments of towns, villages, dwellings, or buildings which are undefended are prohibited,” that pillaging under any circumstance is prohibited, and that family rights, human lives, and private

property must be respected and are prohibited from confiscation (*Hague*, ch. 4, art. 25, 28, 46). These articles allude to the forced involvement of civilian life in a conflict; tellingly, they provide rules that were violated in the Mexican Revolution on multiple occasions.

Antecedents to the Mexican Revolution

The Mexican Revolution began on 5 October 1910, with the proclamation of the *Plan de San Luis Potosí* by Francisco I. Madero. Madero delivered the call for revolution with the intent of overthrowing the presidency of Porfirio Díaz, a former general in México's Federal Army who had ruled México almost without interruption for 35 years. Díaz, whose presidency and governmental regime was known as *El Porfiriato*, ruled México as a dictatorship; he instituted extensive economic and political policies that served to exploit the labor of the urban working classes and rural, Indigenous and Mestizo peasantry. These policies benefited México's economic elite and Western imperial interests in the manner typical of the neocolonialism that defined much of Latin American politics and economics at the time. The words of Encarnación Acosta, a *campesino* (peasant) from the northern state of Chihuahua who joined the revolution at the age of 13, embody how Díaz's policies disaffected working-class Mexicans:

The landlord who oversaw our land would often taunt and debase my father. My father would only take so much of this abuse and tried to defend himself as a human with individual rights. The unfair landlord hit my father for being so outspoken. I ran to defend my father and this cold creature hit me down too. We took our complaint to the officials under Díaz, who, instead of being sympathetic, took our ranch along with the newborn harvest. (Kallas 247)

Cases like these, where wealthy landowners and political officials collaborated in the exploitation and brutalization of *campesinos*, were commonplace during the Porfirian era. Díaz was able to rule unopposed for so long largely because of his use of "carrot-and-stick" measures, negotiating political and economic benefits for political opponents who accepted bribes, while physically or legally coercing those who would not submit to his rule. In doing so, he constructed a highly centralized state designed by Díaz's *científico* (scientific) advisers, who advanced political and economic policies that worked to "modernize" México, establish a middle class, and create a coalition of industry and governmental elites under the banner of "*Porfirismo*," the ideological doctrine of Díaz (Knight 1: 21-22). In addition to heads of industry and government, military leaders also were party to this coalition and ideology, due to Díaz's fame as a general.

Throughout the reign of *El Porfiriato*, various rebellions surfaced, typically originating in northern and central-southern states, and from the rural, peasant, and (often) indigenous

peoples there who held grievances with Díaz's political and economic order. The northern states had a longstanding tradition of autonomy, or at least decentralization from government forces. This, together with histories of Indigenous resistance to Spanish and Mexican conquest (such as the Yaquis from the state of Sonora), as well as the desert and highland geography that favored concealment, all combined to foment rebellion (Knight 1: 115-116). In the south, *hacienda*-style agriculture and land distribution, which favored the wealthy landowning few over the poor and often Indigenous *campesino* masses, was the most significant drive of revolts against the governing forces (Knight 1: 79;82). In response, local and federal government officials called on the Federal Army to suppress these rebellions, frequently implementing brutal measures in doing so. For example, throughout the reign of *El Porfiriato*, the federal government engaged in a series of wars with the aforementioned Yaqui peoples, resulting in numerous recorded massacres of noncombatant Yaqui men, women, and children; this eventually culminated in the forced deportation of 8,000 – 15,000 Yaquis from their home territory in Sonora to southern Mexican states between 1902 and 1908 (Schmall).

This history of political and economic oppression, popular revolt, and harsh military suppression influenced the development of the Mexican Revolution and the emergence of total war through its duration. In the words of Acosta, "I joined [the revolution] more by impulse, outrage, and revenge than patriotism [...] While fighting the government soldiers I felt I was fighting against all injustices of all the landowners for their greediness and abuses of the poor" (Kallas 247; 250). Many of those who fought in the revolution did so to end oppressive rule. To accomplish this goal, they would often use any means necessary to ensure that the reign of injustice would end. By this reasoning, one can begin to understand why total war would come to define the Mexican Revolution.

The First Phase of the Mexican Revolution: Popular Uprising

Madero achieved a popular revolution upon the pronouncement and promulgation of his *Plan de San Luis Potosí* in late 1910, primarily gaining his support from *serrano* (mountain-dweller) movements in northern México, like those of Pancho Villa and Pascual Orozco in Chihuahua, which followed the traditions of past rebellions by focusing on enhancing local autonomy, advancing agrarian and economic reform, and combatting the centralization of government propagated under *El Porfiriato*. Madero gained additional support amongst *agrarista* (agrarian reform) movements in the south, like that of Emiliano Zapata, which, while following previous trends, were focused almost exclusively on land reform and achieving greater land repatriation for peasants (Knight 1: 169). Madero and those who answered his call succeeded in overthrowing Porfirio Díaz in May 1911, with Madero elected as president of México in the following November election.

The Second Phase of the Revolution: Revolutionaries in Power

Although the second full year of revolution in México saw the advancement of free elections and restoration of constitutional rule that Madero promised in his *Plan de San Luis Potosí*, this progress was marred by growing discontent with his lack of substantial economic and social reform; his inability to commit to either the conservatives or the radicals vying for his support; and his decision to disband the revolutionary groups that helped him achieve power, instead relying on the military leaders and Federal Army that had fought against them during the uprising against Díaz. Thus, numerous rebellions emerged with the intent of overthrowing Madero and assuming control of the Mexican government. One was led by Emiliano Zapata, who turned on Madero in order to continue to fight for expanded agrarian reform. Another was headed by Pascual Orozco, who was discontented with Madero's failure to advance radical policies, and felt that he had received insufficient recognition in helping overthrow Porfirio Díaz. Other, reactionary, revolts were led by various conservative leaders, such as Bernardo Reyes (a former general in Porfirio Díaz's army and one-time political ally of Díaz), and Félix Díaz, Porfirio Díaz's nephew, who desired a return to the "traditional" political and economic order that flourished under *El Porfiriato* (Knight 1: 289-333).

First Aspect of Total War: Loss of Civilian Life

La Decena Trágica and the End of the Revolutionary Government

Widespread civil discontent turned to terrible violence in February 1913 with *La Decena Trágica*. Following failed rebellions in both August and October 1912, respectively, both Reyes and Félix Díaz were apprehended by Federal forces and incarcerated in México City (Knight 1: 481). Due to the continued influence of *Porfirismo* amongst the military and police command, Reyes and Díaz planned and instigated a coup from within prison with the assistance of many of the military forces stationed within the city, primarily those of Generals Manuel Mondragón and Gregorio Ruiz, career military men who served throughout *El Porfiriato* (Knight 1: 481). The coup began on the morning of 9 February, with an attack on the National Palace by a force of rebel Federal soldiers led by Díaz and Reyes. The attack was ultimately a failure, resulting in the death of Reyes and the forced retreat of the remaining rebel Federal forces to La Ciudadela, an old arsenal a mile and a half away from the National Palace (Knight 1: 482). Over the next ten days, much of the fighting would occur in this area. This first battle and the subsequent fighting in *la Decena Trágica* provides instances in which non-combatants were either intentionally or accidentally targeted by the warring factions, as well as supplementary examples of both excessive violence perpetrated by combatants and the destruction of civilian property.

Articles from three different news outlets, as well as historian Alan Knight's *The Mexican Revolution*, are helpful in analyzing the events of *la Decena Trágica*. The first periodical source is the Mexican-based *Regeneración*, created by "los Hermanos Flores Magón," three reporters during the period of *El Porfiriato* who were well known for their socialist and anarchist beliefs, for their opposition to Porfirian politics, and for their resistance to censorship of the press. The second periodical source is the Mexican-American *La Prensa*, published in San Antonio, Texas which shows a more favorable bias towards the reactionary forces in its coverage of the events. The third periodical is the US-based *New York Times*, which doesn't reveal a clear bias for either side in the conflict (but could potentially hold a more conservative bias, given the US government's support for Porfirio Díaz and the economic interests of American investors and businessmen in México at the time). A *New York Times* article published on 10 February 1913 describes the outbreak of fighting in front of the National Palace on the first day of *la Decena Trágica*, stating that "[i]n this engagement, more than 300 persons were killed. Most of them were non-combatants. A large crowd had gathered around the palace, and into the assemblage both sides fired" ("Army Revolts" 1-2). This version of the events is supported in the article from *La Prensa*, which reported that, "The assaulting troops gave several charges over the crowd that witnessed the fight, resulting in various deaths and injuries [...] In the battle that the belligerents sustained in front of the Palace, it is calculated that there were around 200 deaths" ("El epílogo de la gran tragedia revolucionaria parece estar muy cercano" 1). Despite the differences in overall death toll, both accounts are further confirmed in Knight's analysis: "For some ten minutes the Zócalo became a battlefield: Reyes was shot dead along with 400 others, many of them civilian bystanders" (1: 483). These accounts ultimately conclude that both the military rebels under Díaz's command and the Federal soldiers under Madero committed violence against a non-combatant populace, a trend in the warfare that would be repeated in the coming days.

The third day of fighting in *la Decena Trágica* saw combatants continuing to commit acts of violence against non-combatants, this time additionally destroying civilian property. A *New York Times* article covering the fighting noted that during the attack on La Ciudadela, "[h]eavy artillery were used on both sides, and the firing was directed without regard to the non-combatants in the streets or to the property of foreigners. The government losses are heavy. One estimate is over 1,000 killed and wounded [soldiers]. This is probably conservative. The loss among non-combatants is also heavy" ("Madero Spurns Offer" 1). Articles from both *Regeneración* and *La Prensa* further affirm this form of close-quarters combat within the city and the destructive effect it had on civilian life. *Regeneración* states that, "[t]ransformed into crazy [persons], into brutes, the men of the [Federal] army have divided into two bands and, spewing thousands of grenades and cannonballs, have left México City in ruins and murdered thousands of men, women, and children" ("El Gobierno Maderista ha Muerto" 1). Meanwhile,

La Prensa expresses that “[w]ith the bombardment of La Ciudadela, many private residences have been destroyed, causing the deaths of countless persons” (“El Epilogo de la Gran Tragedia Revolucionaria Parece estar Muy Cercano” 1).

These articles could be seen as embellishing their narratives in order to serve either their own biases or the interests of their leadership. However, Knight’s description confirms the authenticity of these accounts, noting that “[o]n the morning of 11 February, government forces opened the attack on La Ciudadela with a massive artillery barrage (to which the rebels replied in kind) followed by waves of infantry; there were over 500 casualties, including many civilians” (1: 483). The evidence gleaned from all four accounts indicates that these weren’t mere accidental killings of a few non-combatant bystanders, but rather that both the Federal Army and the military rebels under Díaz’s command showed explicit disregard for the safety of nearby non-combatants, resulting in the deaths of many innocent people. The deaths of civilians caught in the crossfire provide insight into how the Mexican Revolution would eventually reach conditions of total war, and foreshadowed much of the escalation in violence and brutality that would be seen in the following years.

Due to political dealings between Felix Díaz and General Victoriano Huerta (a high-ranking general during *El Porfiriato* and a known associate of Reyes who had been appointed by Madero to lead the Federal defense during *La Decena Trágica*), as well as continued hostility from the reactionary elements of the Federal Army, Madero’s aspirational government was doomed to fail. On 19 February 1913, the 29th Battalion under command of *Porfirista* General Blanquet marched into the National Palace and arrested President Madero and Vice President José María Pino Suárez, ending Madero’s term as president and effectively establishing Huerta in his place (Knight 1: 487). Three days later, Madero and Pino Suárez were shot and killed while being transported to the Federal District penitentiary. Although the official report from Huerta’s government claimed that rebels attempting to liberate the two attacked the convoy transporting them, and that Madero and Pino Suárez were gunned down while attempting to escape, it is widely believed that Huerta simply had the two executed for posing future threat if left alive (“Huerta Promises” 1). Ultimately though, the revolution did not die with Madero’s murder: in the words of Renato Leduc, a Mexican journalist who worked as a telegraphist during the revolution, “[Madero’s] death started the real revolution” (Reed ix).

The Third Phase of the Revolution: Civil War

The period of the Mexican Revolution lasting from March 1913 to July 1914 involved a civil war between Huerta’s counterrevolutionary Federal Army and the newly emergent Constitutionalist Army, led by a coalition of Venustiano Carranza, Francisco “Pancho” Villa, and Álvaro Obregón. Carranza was the governor of the state of Coahuila, and following the assassination of Madero, he issued his *Plan de Guadalupe* in March 1913, which called for the

deposition of Huerta and the re-establishment of a democratic, constitutionalist government. Carranza was joined by Villa's Division of the North and Obregón, a former rancher who had fought in the rebellions of 1912 and would become arguably the most celebrated military strategist and general in both the Constitutionalist Army and the Mexican Revolution as a whole. Most of the fighting between the Constitutionlists and the Federal Army in this period was concentrated in northern and central México, especially in the states of Chihuahua (Villa's home state), Coahuila, Durango, Aguascalientes, Jalisco, San Luis Potosí, and Guanajuato. This period of the Mexican Revolution is typically characterized as one of the bloodiest phases of the revolution, and for that reason, much of my analysis will be drawn from the events of this period. Specifically, the battles of Gómez Palacio and Zacatecas provide prime examples of how the acceleration toward a year-long civil war led to escalations in the methods and brutality of the combat.

Second Aspect of Total War: Superfluous Violence Between Combatants

The Battles of Gómez Palacio and Zacatecas

Analysis of the Battle of Gómez Palacio, which occurred 22 –26 March 1914 draws from first-hand accounts of the battle. At Gómez Palacio, the Federal forces were able to wield around 10,000 soldiers, while the Constitutionalist forces, commanded by Villa, were likely able to employ between 7,500 and 10,000 soldiers (Knight 2: 143-145). Throughout Reed's account of the battle, two known instances emerge in which Federal forces used poison as an attempt to wound or kill their opponents. The first is described in a conversation between Reed and a general:

"You see the water from these ditches comes from the river inside the town, so I thought it might be a Federal paper." I took it from his hand. It was a little folded white piece of wet paper, like the corner and front of a package. In large black letters was printed on the front, "*ARSENICO*," and in smaller type, "*Cuidado! Veneno!*" "Arsenic. Beware! Poison!" [...] "A good many of the men have had bad cramps in the stomach, and I don't feel altogether well. Just before you came a mule suddenly keeled over and died in that next field, and a horse across the ditch" [...] I explained to him that the Federals had poisoned the ditch. (Reed 234)

Later, Reed notes that "[o]n the very edge of this road, under a bush, was an earthen jar full of milk. 'Poisoned,' [a Constitutionalist soldier] said briefly. 'The first company stationed over

here drank some of that stuff. Four died''' (Reed 238). Article 23 of The Hague Convention expressly states that the employment of poison or poisoned weapons is forbidden, and given that the Federal soldiers, being representatives of the federal government and being thereby bound to its signing of the Convention, committed poisoning, this case represents a clear violation of the Hague Convention and its prohibition of certain types of weapons and agents of warfare (Hague; ch. 4, art. 23). Given that at least four men were killed and many more wounded due to the use of this poison, the intent to grievously wound or kill the opposing belligerents is treated as though it were an acceptable aspect of warfare. Furthermore, given that the soldier in the account states that the water they found poisoned originated from a river inside the town, it can be surmised that a significant portion of the river was poisoned; this suggests the very possible danger of non-combatants consuming the water and suffering harmful effects or even death from its contamination.

The Battle of Gómez Palacio culminated in prolonged attacks for the final two days of the battle on principal locations in the town of Gómez Palacio, known variously as the Lerdo, the Cerro, the Corral, and the cuartel. Reed describes a scene in which Constitutionalist forces advancing on the town were fired on with heavy artillery:

They were opening upon the little line of climbing men with artillery! The ring of flame was broken now in many places, but it never faltered. Then all at once it seemed to wither completely, and little single fireflies kept dropping down the slope—all that were left [...] That night they attacked the Cerro seven times on foot, and at every attack seven-eighths of them were killed." (252)

This condition of warfare violates two of the components of Article 23 of The Hague Convention: the prohibition of murder and treacherous wounding of belligerent forces and the employment of arms, projectiles, or materials intended to cause unnecessary suffering (Hague; ch.4, art. 23). The effective use of artillery by the Federal forces against unshielded combatants represents employment of arms intended to cause superfluous injury and suffering. The added weight of each attacking force suffering the deaths of almost 90% of their men evidences the Federal forces' flagrant attempt to massacre the Constitutionalist opposition. All in all, the Constitutionlists were able to emerge victorious at the Battle of Gomez Palacio, but suffered casualties in the figures of 1,000 men killed and around 2,000 men wounded; this further exemplifies the high stakes and brutality of this phase of the revolution (Reed 254).

The death blow to the Federal army and the end of this phase of the Mexican Revolution came on 23 June 1914, with the bloodiest battle yet: The Battle of Zacatecas. The

battle, which began on 17 June and ended on 23 June, involved over 20,000 Constitutionalist soldiers from Villa's Division of the North and 12,000 Federal soldiers. As Knight describes it,

at Zacatecas the rebels stoppered every outlet and subjected the fleeing Federals to withering enfilade fire. The defeat became a rout and the rout became a massacre. Maybe 6,000 Federals died: some killed when the public buildings and arsenal were dynamited; some—the officers—who could not escape summary execution [...] All told, only a few hundred of the Federal garrison of 12,000 reached Aguascalientes; of the rest, maybe half were killed and half taken prisoner. (2: 168-169)

Knight's description of the Battle of Zacatecas provides several examples of how extreme and unnecessary violence inhered in this phase of the Mexican Revolution. The Constitutionals' attempt to stop all Federals from escaping and instead to murder them shows that they did not abide by the rule to solely incapacitate the enemy; rather, they attempted to exterminate the Federal army entirely. The casualty statistics for the Federals further support this, as at least 6,000 Federal soldiers were killed in combat, and a further 3,000 were wounded, representing casualties of at least three quarters of the Federal forces stationed at Zacatecas (Knight 2: 168).

Furthermore, the execution of captured Federal officers provides an example of how Constitutionals violated The Hague Convention's mandate prohibiting the mistreatment of prisoners. Instances exist throughout the revolution where armies, regardless of faction, mistreated and executed prisoners. During the attack on the National Palace in *La Decena Trágica*, fifteen military cadets and General Ruiz were captured and summarily executed by Huerta (Knight 1: 483). Though captured foot soldiers were executed during the first phase of popular revolt, the execution of a high-ranking officer like General Ruiz marked an escalation in the brutality of the treatment of prisoners. This escalation would be seen in the following period of civil war, especially amongst Villa's Division of the North, who were well-known for murdering captured Federal officers in every battle fought against them (Reed 143). The case of Zacatecas, therefore, reflects the rule rather than the exception, and shows how a brand of unjust warfare that emphasized massacring one's enemies and violating the rules of war had become the norm by the end of the first civil war.

The Fourth Phase of the Revolution: A Second Period of Civil War

The Battle of Zacatecas led to the resignation of Huerta as president on 15 July 1914, the arrival of Carranza's and Obregón's Constitutionalist forces in México City in early August (Villa's Division of the North had retired to Chihuahua to protect its home territory), and the signing of the Treaty of Teoloyucán on 13 August, which required the dissolution of the Federal army and transferred the position of national government to the hands of

the Constitutionals (Knight 2: 169-171). The Convention of Aguascalientes was called to reintroduce constitutional government, involving delegations from Carranza, Obregón, Villa, and Zapata, but quickly broke down due to politicking and differing plans for social and economic reform between the alliances of Carranza and Obregón, and Villa and Zapata. Civil war broke out for a second time in the Mexican Revolution, this time between Zapata's and Villa's Conventionalists and Carranza's and Obregón's Constitutionals. This phase of civil war lasted from 1915 to 1917, and is characterized as one of the most brutal phases, largely due to the style of the warfare developed between the Constitutionals and Huerta's regime. By the end of 1916, the Constitutionals would emerge as the new regime in power, having defeated the Conventionalists, forced Villa and Zapata to convert their forces into smaller guerrilla bands, and ended the period of mass armed conflict.

Third Aspect of Total War: Exploitation of Civilian Resources

The third and final aspect of total war in the Mexican Revolution is the often-coerced involvement of the civilian sphere by different military forces, especially in relation to resources, supplies, and labor force. One of the first large-scale instances in which civilian resources were adversely affected by the fighting in the revolution occurred during the events of *La Decena Trágica*. The article from *La Prensa* covering the events of the third day observed that, after the artillery barrage on La Ciudadela, “[t]he city is found without lighting and a panicked terror overcomes the inhabitants. The electric streetcars don’t circulate, and only the ambulances working to collect the dead and injured pass through the streets” (“El epílogo de la gran tragedia revolucionaria parece estar muy cercano” 1). Instances like these are further corroborated by the *New York Times* article from the third day, which noted severe food supply shortages throughout the capital, and Knight’s account which stated that “[s]hells were lobbed across the city centre, machine-gun fire raked chic residential and commercial streets. The lamp-posts leaned, and festoons of telegraph wire draped themselves across deserted plazas. Rubble and corpses strewed the streets, and between them dodged ‘Buen Tono’ vans, acting as makeshift ambulances [...] Fresh food became scarce, prices shot up, and some people—it was later said—dined on dog and cat” (1: 484). The failure of the city’s electricity, the dwindling food supply, and the loss of other civil services reveal how the strain on civilian resources became a central theme during *la Decena Trágica*, a theme which would be repeated and amplified as time went on and the revolution intensified.

A case from *My Village During the Revolution* describes specific instances in which the factioned armies came into villages and expropriated food supplies: “[t]he Constitutionals arrived with their almost yellow uniforms, in search of wheat, and they unfortunately found it, put it in sacks, then took it away [...] Then came the crude, hated *Zapatistas* in search of corn,

and they unfortunately found it, then carried it away” (Batalla 96). From the beginning of the revolution, it was common practice for armies to seek sustenance as well as lodging from the people whose territory they occupied. This style of accommodation might be coerced through the threat of violence, or might be requested but inadequately compensated with currencies whose use and value depended on the time, place, and person. The appropriation of housing and food supplies occurred throughout the entire period of armed conflict, for various reasons: as a way for an army to impose power and control over those they occupied; as the cost of the army’s “protection” of the people against other armed forces; and as the standard material consumption exacted by a large body of transient soldiers. Ultimately, whether Federal or independent, revolutionary or reactionary, all factions of the revolution engaged in the practice of confiscating or inadequately paying for the resources of the regions they occupied.

In addition to food and lodging, transportation, communication, and real estate were also appropriated by Federal and revolutionary forces. By the civil war of 1913-1914, it had become common practice for retreating armies to destroy or impair railroads, telegraph lines, and other methods of transportation. These actions further damaged the ability of the vast majority of the Mexican population to utilize these essential resources, and given the lack of consistent administration and supplies to fix the damages, preventing many citizens from using such resources for months. Reed describes an instance preceding the Battle of Gómez Palacio:

After an hour of riding we came to a piece of broken track [...] It was an old destruction, probably a year old, made when these same Constitutionals were retreating north in the face of Mercado’s Federal army, and we had it all fixed in an hour. Then on again. Sometimes it was a bridge burned out, sometimes a hundred yards of track twisted into grape vines by a chain and a backing engine. (Reed 193)

Cases of intentional destruction like this are noted by Knight and Reed, indicating that these weren’t isolated instances, but a standard practice of war that became more and more entrenched as the revolution dragged on.

Examples of more “forceful” forms of expropriation can be seen in the acts of pillaging towns and the theft of personal property, both of which had been expressly prohibited by Articles 28 and 46 of The Hague Convention. Such an instance of pillaging and confiscation of property is exhibited in Edith Henry’s memoir *The Death of Frank Henry*. The author recalls the invasion of the town of Zacualpan on the border of the states of Guerrero and Mexico in 1916 by *Zapatistas*. During the invasion, the *Zapatistas* ransacked Henry’s house and pillaged both it and the rest of the town. Henry noted that “[t]hey tore off my wedding ring [...] They demanded money and our weapons, and with the muzzle of a gun at my head I showed where

the other two guns were, and where my silver teapot and a few other things were hidden” (Henry 99).

Looting occurred throughout the different phases of revolution: at a time when large groups of armed individuals challenged government authority, it is clear how cases like large and small-scale larceny could occur. The pillage of Zacualpan took place in 1916, well into the second civil war between the Constitutionalists and the Conventionalists: by this time, the country had been in armed conflict for six years, and civilians were experiencing more acutely the effects of extended periods of warfare.

Villa’s implementation of conscription into his forces in 1916 was one manifestation of this escalation. During the first phase of popular revolt and the period of civil war between Huerta and the Constitutionalists, the revolutionary forces were largely made up of volunteers. During the civil war between the Conventionalists and the Constitutionalists, particularly in the latter days of Villa’s continued insurgency following his defeat at Celaya, troops began to be amassed forcibly. The account of Jesús Avila from *Aquellos Años de la Revolución* describes his forced service: “Villa issued a decree in the State of Chihuahua [in 1916]. Every male member of a family was to serve in his troops. I was barely fifteen years old” (qtd. in Kallas 265-266). Additionally, Maria Villasaña Lopez was abducted from her home at the age of 14 in 1916 by *Villista* forces, and her account demonstrates how conscription was experienced by a young woman during the revolution:

Before they left the area, General Bonilla kidnapped me and another officer took my younger sister from our home. My mother wept and pleaded for them to leave us with her, but not our tears, our panic, or our screams helped at all. I was given a rifle just like the other women [...] I did help in washing the wounds of the soldiers and in caring for the sick. Many times we were half naked from making bandages with our clothes. (Kallas 367)

Both Avila’s and López’s accounts makes it apparent that conscription became a hated condition of the warfare in the Mexican Revolution as it dragged on and as it drained resources, even in terms of human lives and labor.

All in all, the appropriation of civilian resources by the different armies of the revolution occurred in a variety of ways. Certain aspects were present throughout the conflict, while others developed as the tactics used by revolutionaries to achieve order in government became harsher. However, one constant was the effect that this exploitation had on civilians themselves. Although life under *El Porfiriato* certainly negatively impacted a large percentage of the Mexican population, the years of protracted warfare, increased consumption of resources, and the fear produced by living under constant threat of occupation during the

Mexican Revolution had an increasingly debilitating effect on México's people. By the end of the period of mass armed conflict in 1917, a significant portion of the hundreds of thousands of deaths seen in the revolution could likely be attributed to the increased material, physical, and psychological strain on civilians and civilian resources caused by the developments in war.

Conclusion

In conclusion, the Mexican Revolution exemplifies the concept of total war manifested on multiple levels. Through the examination of the degree of violence used by combatants, the failure to protect non-combatants from harm, and the complete absorption of civilian resources and other areas of life, it becomes apparent that this was an armed conflict unrestricted in its methods of war. Furthermore, as the revolution dragged on, the various factions involved became more and more willing to engage in practices of total war.

There are various reasons as to why the revolution escalated to a conflict of total war proportions, including, as I have demonstrated, the greater implementation of heavier weaponry, more brutal military tactics, and the extended duration of the revolution. However, examining various sources reveals that one of the biggest factors in producing total war in the Revolution was ideological difference: those existing both between revolutionaries and the counterrevolutionary ideology of the federal governments, and between the various revolutionary forces themselves. Once the call for popular rebellion was put forth in 1910, many of the revolutionary forces that answered it did so with the shared belief in their need to overthrow *El Porfiriato*, return the nation to a state of democracy, and end the exploitation of México's *campesinos* and working-class peoples. The first two goals were achieved within the first year of the revolution, but the goal of extensive social and economic reform slipped out of reach once the country saw the return to the *Porfirismo*-style of government following Huerta's overthrow of Madero. Thus, upon entering into civil war with Huerta, the revolutionaries committed themselves to deposing his regime by any means necessary, so as to cancel Madero's mistakes that prevented reform at the national level. On the other side, Huerta viewed the revolutionaries' movement for social and political change as being wholly unfounded, he himself desiring a return to the *Porfirismo* that he believed to be the correct governance and social order for the country. To bring this about, he attempted to crush the revolutionary movement as swiftly and absolutely as possible in order to return civil order to the country. Both parties therefore escalated their methods and measures of warfare to that of total war proportions.

The later civil war between the Constitutionalists and the Conventionalists followed similar lines. The Convention of Aguascalientes in 1914 attempted to unify the various political, social, and economic desires proposed by the numerous revolutionary forces that

composed the Constitutionals and their allies. The failure of the convention exposed the irreconcilable differences within the revolutionary movement, and prompted a return to warfare that would essentially rehash the conflict played out between Huerta and the Constitutionals for control of the country (Knight 2: 261-264). Exacerbated further by the increasing popular sense that the revolution was turning into a perpetual war, the revolutionaries reengaged in methods invoking total war in an attempt to seize power as quickly as possible. The escalation in warfare between Villa's Conventionalists and Obregon's Constitutionals, as well as the rapid revision of the constitution in 1917, demonstrates the Constitutionals' desire to expedite their version of governmental order and stability (Knight 2: 470). Therefore, ideological differences between the various sides of the revolution largely motivated their engagement in total war methods, with the view that doing so would allow them to prevent the triumph of the opposition's control of Mexican affairs. That being said, other factors certainly contributed to the development of total war, which is a subject that should be further explored in the future.

This essay demonstrates the need for more research devoted to the Mexican Revolution, its military history, and how this conflict affected and was experienced by those who lived through it. Furthermore, greater consideration should be given to the Mexican Revolution and its place in the historiography of the concept of total war. The case of the Mexican Revolution provides an example in which, through contemporary definitions of total warfare, we are able to examine a revolution through the lens of a concept typically only associated with Western wars. Therefore, this concept's scope could be widened to describe other global revolutions or mass armed conflicts, both in the past, and in more contemporary contexts.

Works Cited

"Army Revolts, Seizes México City; Madero's Troops Hold the Palace; 300 Are Slain in the First Clash." *New York Times*, 10 February 1913, pp. 1-2. *New York Times* <https://timesmachine.nytimes.com/timesmachine/1913/02/10/issue.html>.

Bonfil Batalla, Guillermo. "My Village during the Revolution." *The Mexican Revolution: A Brief History with Documents*, edited by Mark Wasserman, Bedford/St. Martin's, 2012, pp. 94-96.

"El Gobierno Maderista ha Muerto." *Regeneración*, 22 February, 1913, pp. 1. *Archivo Magon*, <http://archivomagon.net/wp-content/uploads/e4n129.pdf>.

"El Epilogo de la Gran Tragedia Revolucionaria Parece estar Muy Cercano." *La Prensa*, 13 February, 1913, pp. 1. *Library of Congress: Chronicling America*, <https://chroniclingamerica.loc.gov/lccn/sn83045395/1913-02-13/ed-1/seq-1/>.

Henry, Edith. "The Death of Frank Henry." *The Mexican Revolution: A Brief History with Documents*, edited by Mark Wasserman, Bedford / St. Martin's, 2012, pp. 97-100.

"Huerta Promises to Satisfy Society on Killings." *New York Times*. 24 February 1913, pp. 1. *New York Times TimesMachine*, <https://timesmachine.nytimes.com/timesmachine/1913/02/24/issue.html>.

"Convention (IV) respecting the Laws and Customs of War on Land and its annex: Regulations concerning the Laws and Customs of War on Land. The Hague, 18 October 1907." *International Committee of the Red Cross*. 18 October 1910, <https://ihl-databases.icrc.org/ihl/INTRO/195>.

Kallas, James, et al. *Aquellos Años de la Revolución Mexicana 1910 – 1920 [Those Years of the Revolution, 1910 – 1920]*. San José, California: Aztlan Today Pub. Co., 1974.

Knight, Alan. *The Mexican Revolution, Vol. 1: Porfirians, Liberals and Peasants*. Cambridge: Cambridge University Press, 1986.

---. *The Mexican Revolution, Vol. 2: Counter-revolution and Reconstruction*. Cambridge: Cambridge University Press, 1990.

"Laws and Customs of War on Land (Hague, IV)." 1907. *Library of Congress*, <https://www.loc.gov/law/help/us-treaties/bevans/m-ust000001-0631.pdf>.

"Madero Spurns Offer of Mediation and Opens Attack on Foe." *New York Times*, 12 February 1913, pp. 1. *New York Times TimesMachine*, <https://timesmachine.nytimes.com/timesmachine/1913/02/12/100388297.html?pageNumber=1>.

Reed, John. *Insurgent Mexico*. International Publishers Co., Inc., 1969.

Schmall, John P. "Watching the Yaquis from Los Angeles (1894-1937): Enduring Resistance in the Face of Extermination." *Indigenous México*. Last modified September 12, 2019. <https://indigenoumexico.org/sonora/watching-the-yaquis-from-los-angeles-1894-1937-enduring-resistance-in-the-face-of-extermiation/>.

"Total war." *Encyclopedia Britannica*. <https://www.britannica.com/topic/total-war>

"Total war." *Oxford Reference*. <https://www.oxfordreference.com/view/10.1093/acref/9780199891580.001.0001/acref-9780199891580-e-8377>.



Contributor Biographies

Authors

Katie Anderson is a fourth-year student from Half Moon Bay, California who will graduate in June 2021 with a BA in Psychology and Interdisciplinary Liberal Studies. She conducted research in the Statistics and Research Methods course at Seattle University, and it won the psychology department's Outstanding Undergraduate Research Award. Her desire to promote the need for childhood mental and physical health interventions influenced her decision to investigate sex education and its impact on communication skills, self-efficacy, and relationship satisfaction in her research. She currently works as a registered behavior technician and provides ABA treatment for children with autism. After gaining work experience, she plans to pursue a master's degree in counseling to become a child therapist.

Sahil Bathija is a second-year student majoring in Political Science with a specialization in Legal Studies and minoring in Philosophy. He is a Society, Policy, and Citizenship track honors student and Sullivan Scholar looking toward a future career in law. Currently, Sahil works as a youth fellow at the non-profit Asian and Pacific Islander Americans for Civic Empowerment (APACE) to civically engage minority and underrepresented communities to build a better democracy. Sahil's other undergraduate publications include "The Church Under (Printing) Press-ure: The Fates of Copernicus and Galileo," published by Loyola Marymount University in the 2021 edition of Attic Salt. At Seattle University, he serves as a member of Rotaract and Circle K International to volunteer and give back to his community. He also is a varsity athlete and club treasurer for the SU's Men's Crew team. Born and raised in Juneau, Alaska, Sahil also enjoys hiking and anything else outdoors.

Colleen Cronnelly is a 2020 graduate from Seattle University. She majored in International Studies with Departmental Honors and minored in Arabic and Business Administration. During her time at Seattle University and during an internship with the Moroccan American Commission for Educational and Cultural Exchange, Colleen became interested in investigating educational inequalities on both the global and local scale. Colleen's departmental honors thesis project focuses on the educational barriers that adult refugees from Somalia living in King County, Washington must overcome. Colleen interviewed leaders with local non-governmental organizations to gain insight on the needs of the Somalian refugee students and the organizations that serve them. Next year, Colleen will continue to address educational inequity in her position with the after-school program, New Jersey Law and Education Empowerment Project, and she hopes to one day be an advocate for educational opportunities with the US State Department.

Isabel Gilbertson is a third-year undergraduate student pursuing a double-major in Psychology and Public Affairs with interests in public health and health equity. She is a graduate of Seattle University's Honors Program: Society, Policy, and Citizenship - an intensive two-year curriculum based in public policy and social science. Isabel is passionate about the intersection between psychological science and public policy and how each discipline has the power to enact change. During the COVID-19 pandemic, Isabel worked as a research assistant to Dr. Mauseth's disaster relief work at the Washington State Department of Health. After her undergraduate career, Isabel hopes to attend graduate school and continue to fight to decrease systematic disparities in access to healthcare and health outcomes.

Neha Hazra is a fourth-year student double-majoring in Psychology and Philosophy with a minor in Women, Gender, & Sexuality Studies. They will be graduating in June 2021! Neha is keenly interested in phenomenology, and they are currently finishing their honors thesis within the Philosophy department concerning trauma, child development, and the experiences of migrant children in US/Mexico border detention centers. While working as a desk assistant for the Philosophy department, Neha has had multiple experiences working with children and families in educational and healing roles, and they hope to continue on to become a Child Psychologist with a focus on trauma. They plan to work at Smokey Point Behavioral Hospital after graduating and working as a research assistant with Seattle Anxiety Specialists, PLLC., as well as hopefully adopting a feline friend!

Alexandra Ionescu graduated from Seattle University in June of 2020 with a BS in Mathematics and a minor in Economics. She is originally from Berwyn, Illinois, but currently lives in Seattle. While attending SU, Alexandra worked as a calculus tutor for three years and also served as a calculus study group facilitator for two years. Besides the research she conducted alongside Professor Allison Henrich, Brooke Matthews, Isaac Ortega, and Kelemua Tesfaye for "Knotris: A New Game," she also did her senior synthesis research project on a different aspect of Knot Theory and focused on exploring petal projections. Currently, she is looking into Masters programs at schools located on the East Coast where she plans to continue pursuing either Mathematics or Economics.

Brooke Mathews graduated from Seattle University in 2020, with a BS in Mathematics and a minor in Computer Science. Currently, she is working on applications for law school and hopes to pursue a career in the legal field.

Monica McKeown graduated from Seattle University in June of 2020 with double majors in International Studies and Spanish and minors in Environmental Studies and Latin American Studies. During her senior year, she researched ecotourism and sustainability assessment as part of her thesis for International Studies with Departmental Honors. Monica's interest in ecotourism was sparked by her time studying abroad in Costa Rica as well as through an opportunity in which she joined Dr. Tanya Hayes and Dr. Felipe Murtinho on a research trip to Ecuador where they studied the effects of a payment for environmental services (PES) program. Currently, Monica works at a mission-driven startup helping sustainable farmers grow their businesses by selling their products online.

Brandon McWilliams is a fourth-year Environmental Studies and English Creative Writing Major. At Seattle University, he has focused on the intersection of the environment and stories, specifically focusing on how the language we use to speak about the environment can be leveraged for societal change. His work has been published in *The Seattle Times*, *Fragments*, *Lucky Jefferson*, and *Hidden Compass Magazine*, among others. He has also been a featured reader at San Francisco Lit Quake 2019, won silver in the Solas Awards Young Writer category, and is an Editorial Fellow at *Lucky Jefferson*. He works as an outdoor educator with the Outdoor Department, and in his off hours spends as much time as he can outside or cooking. After graduation he hopes to pursue a master's degree in environmental humanities and continue his work in ecocriticism and environmental advocacy.

Wailana Medeiros, 21, is a *Kanaka Maoli*, or Native Hawaiian woman, from the Big Island of Hawai'i. She is currently a third-year Political Science major and Anthropology minor at Seattle University, where she is involved in Hui O Nani, Seattle University's Hawai'i club as the Entertainment Chair on the Lu'au Board. She also instructs dances for Hui O Nani's annual Lu'au. She is an avid cultural practitioner; she has been dancing hula and chanting for years, and participated in the protests on Mauna Kea in the summer of 2019, which inspired this mini-ethnography. She is an advocate for Native Hawaiian rights and enjoys spending her free time with friends and family.

Isaac Ortega is a Computer Science and Math major in Seattle University's class of 2020. Currently, Isaac is working as a software engineer at Alaska Airlines, but when he is not working he enjoys creating and playing video games. Isaac really enjoyed working on and developing Knotris. He appreciated the creative freedom and excitement that came along with designing, developing, and analyzing his own math game. Isaac thinks that Knotris is unique in that it finds a balance between being simple and complex, and allows individuals

from a variety of mathematical backgrounds to pick it up and play. He is hopeful that this will make the studying of Knot Mosaics much more accessible and exciting for a wider audience of young mathematicians.

Talia Rossi is a fourth-year student at Seattle University from San Jose, California. She will graduate in June 2021 with a BA in Psychology and Theatre with Departmental Honors. Her research was conducted Spring Quarter 2020 with Katie Anderson and Stella Roth during the Statistics and Research Methods series, and was supervised by Dr. Michael Spinetta. Talia is interested in sex education research and the implementation of a national comprehensive sex education curriculum. Talia has presented sex education research at the Western Psychological Association and the University of Washington Research Symposium. Talia is also an actor and has performed in seven mainstage shows at the Lee Center for the Arts. In Spring 2021, Talia will be crafting a solo performance honors project through the department of Performing Arts & Arts Leadership. After graduation, Talia hopes to stay in Seattle and build strong relationships within the psychology and theatre communities.

Stella J. Roth is a senior Sullivan Scholar at Seattle University majoring in Psychology and minoring in Sociology. Her interests include public health, sexual education, and public policy. Stella's research was conducted in the Statistics and Research Methods sequence and investigated various impacts of sexual education. Stella and her research partners received the Outstanding Undergraduate Research Award for their presentation at the Psychology and Interdisciplinary Studies Research Symposium, and they will be presenting at both the Western Psychological Association Research Symposium and University of Washington Undergraduate Research Symposium this spring. Stella is currently working as a Research Assistant in the Simoni Lab at the University of Washington. She will graduate from Seattle University with a Bachelor of Science in Psychology in June 2021, and has accepted a position with the Jesuit Volunteer Corps as a Case Manager at Part of the Solution (POTS) in the Bronx, New York City.

Amelia Serafin is an Environmental Studies graduate of the class of 2020. She has volunteered at the Seattle Aquarium doing science communication work, interned at Holland America aiding in environmental policy enforcement, and has been a TA for the Seattle University Biology Department through multiple quarters. She has a particular interest in the marine environment, and SCUBA dives regularly around the Puget Sound. She is currently studying to become a PADI SCUBA instructor and hopes to use this certification to increase awareness of the marine environment and combine her interests in both the social and physical sciences.

Kelemua Tesfaye is a senior studying Applied Mathematics at Seattle University. They are deeply invested in mathematics education and research, as they believe it is a transformative tool for the liberation of oppressed peoples. As a tutor, TA, and teacher, they enjoy engaging students that are rarely included as contributors to the mathematics community and investigating problems they are curious about with them. Developing and studying Knotris was so much fun, and they hope Knotris serves as an entry point for others to learn about Knot theory through play. Kelemua would like to thank Dr. Allison Henrich, Jen Townsend, Alexandra Ionescu, Brooke Mathews, Isaac Ortega, Eden Chmielewski, Andre Dennis, Kellen McKinney for the awesome research experience.

Molly R. Van Dyke graduated from Seattle University in 2020 with a BS in Biology and a minor in Philosophy. At Seattle University, she found her love for enabling accessibility in science and medicine and plans on taking that passion through her dream career as a medical doctor. Her research paper in this journal volume reflects her desire to reimagine healthcare provisions and make science more digestible to the general population. She currently works with University of Washington's Emergency Medical Services department and Seattle Medic One as a research study assistant. Here, she works with an amazing team of doctors and fellow research assistants to improve the quality of Seattle Medic One's care for out-of-hospital cardiac arrests and is currently helping lead a research study aimed at detecting physiological changes in patients about to enter into hemorrhagic shock.

Craig Verniest is a senior at Seattle University graduating in 2021 with a BA in History with Departmental Honors and Spanish, and a minor in Latin American Studies. While studying abroad in México through the Spanish department's Latin American Studies Program (LASP), he gained a strong interest in and engaged with Latin American history, particularly the history of México. This focus inspired his desire to author the paper, "The Manifestation of Total War in the Mexican Revolution." Over the past academic year, he has also acted as a research assistant for a study investigating empowerment amongst low-income, self-sustaining communities in Tijuana, México. This fall he will be pursuing a Master's Degree in History as a graduate assistant at Miami University in Ohio, with the hopes of becoming a professor of Latin American history. His future research interests include investigating the roles of narrative and iconography in the Mexican Revolution.

David Yañez is a third-year honors student aiming to complete a BA in Philosophy and a BS in Psychology, with a minor in Data Science. On campus, he hosts discussions, panels, and debates about local public policy as the President of the Washington Policy Center

Young Professionals Club. He is also the Representative-At-Large for the Seattle University Philosophy Club, and a writing tutor for student athletes. Off campus, he works as a policy researcher for the American Conservation Coalition to create evidence-based, non-partisan environmental policy. After graduation, David aims to pursue a career as a data analyst or attend a graduate program studying Moral Psychology.

Student Editors

Tori Almond is a third-year student at Seattle University from Corvallis, OR. She is majoring in Psychology with a minor in Social Welfare and plans to graduate in June of 2022. Tori was the student editor for Katie Anderson, Talia Rossi, and Stella Roth's essay "Beyond the Birds and the Bees: Sex Education and its Impact on Communication, Self-Efficacy, and Relationships." Next year, she will be entering her fourth year at SU as a third-year Resident Assistant and is looking to pursue Student Affairs in higher education after graduation. Her year-long involvement with the journal has helped her gain skills and experiences that have made SUURJ one of the most valuable experiences in her time at SU, thanks to Dr. Hillard and the rest of the team.

McCalee Cain is a third-year English Literature and French major from Sandpoint, Idaho. This year, she edited Collen Cronnelly's piece, "At Home in King County: Assessing Educational Access in King County for Adult Refugees from Somalia" with fellow student editor Grace Nikunen. Beyond SUURJ, McCalee works closely with first-year French students as a Teacher's Assistant and teaches English to French children in her free time.

Jollan Franco is an undergraduate at Seattle University. She is in her third year and is majoring in English Creative Writing. Currently, Jollan intends to use her degree to become an editor and hopes to someday attend law school.

Alia Fukumoto is a senior at Seattle University who is graduating with a BA in English Literature and a minor in Women and Gender Studies. She works as a Research Assistant at Pacific Northwest Research Institute. As a student editor, she edited Brandon McWilliams' essay, "The Role of Nature in the Japanese American Internment Narratives Through the Lens of Julie Otsuka's *When the Emperor Was Divine*." She enjoys walks in parks, getting boba, and watching *The Great British Baking Show*. After graduation she plans on going to law school.

Isabelle Halaka, originally from San Diego, California, is a third-year student double majoring in International Studies and Political Science. She had the pleasure of editing Monica McKeown's article, "Entry Point for Assessing Sustainability in Ecotourism: Insights from Costa Rica." After she graduates in 2022, Isabelle hopes to spend some time traveling abroad and eventually go to law school to pursue a career in human rights law.

Emma Hyman is a second-year student majoring in Humanities and English Literature. She anticipates graduating in June 2023. Emma served as student editor for Craig Verniest's essay, "The Manifestation of Total War in the Mexican Revolution." She is immensely grateful for the professional experience that SUURJ provided her with, and she looks forward to applying what she has learned through the program to her larger academic and professional career.

Katherine Howard will be graduating June 2021 with a BA in English and a minor in Women and Gender studies. Katherine has completed an internship with Professor Reyes in the English department, reading and selecting literary manuscripts for potential publication in *Big Fiction*, an online journal celebrating new fiction. She is also an editor for the Seattle University chapter of *Her Campus*, an online magazine dedicated to uplifting the voices and writings of women at SU. She is beyond excited to attend Loyola Marymount University in the fall to attain her master's in English, from which she also received a teaching fellowship. She is looking forward to taking the invaluable skills and knowledge she learned from working with such a profound group of individuals in SUURJ, and from editing Sahil Bathija's piece, "Inclusion and Exclusion in Medieval European Craft Guilds," into the classroom where she will teach her own freshman class. She cites SUURJ as the location for her deepened appreciation for words and the profession of editing and teaching.

Cole Janssen is a third-year English Creative Writing major from Bozeman, Montana. This year, he served as the copyeditor for Neha Hazra's piece, "Queerer than Canon: An Exploration of the Relationship Between Fix-it Fanfiction, Sedgwick, and Queer Readings." Cole is a passionate writer, musician, and artist. When Cole isn't copyediting for SUURJ, he is probably rock climbing, taking a hike, playing piano, or loudly listening to Nicki Minaj. After graduation, Cole hopes to take some time in the woods to get some peace and quiet before he goes to graduate school.

Lucas Neumeyer is a senior at Seattle University majoring in Film Studies. He has a deep interest in cinema, particularly Japanese cinema, but also maintains an interest in historical topics. He plans to graduate in June 2021. He served as the student editor for Brooke Wynalda's essay, "Trees take the Street: Urban Tree Growth and Hazard Potential." He hopes to use the skills he acquired as an editor for SUURJ to write film criticism for a periodical.

Grace Nikunen will be graduating in June of 2021 with a BA in Political Science and a BA in Philosophy. She served as co-editor alongside McCalee Cain of Colleen Cronnelly's research paper titled, "At Home in King County: Assessing Educational Access in King County for Adult Refugees from Somalia." She has thoroughly enjoyed her experience working as an editor for SUURJ and is grateful to have had the opportunity to work alongside so many talented student authors, editors, and faculty advisors. She plans to bring the skills and knowledge from this experience with her as she moves forward in her academic and professional careers. Post-graduation in June, Grace has plans to move to Kansas City, MO where she has accepted a position as a high school teacher through Teach For America.

Anna Petgrave (she/they) will be graduating this spring with a BA in English Creative Writing with Departmental Honors, and a minor in Writing Studies. Much of her passions extend toward writing and editing. Her work is varied and sometimes hybridized, but it primarily focuses on the philosophy of the human person and the curious ways in which we can affect one another. She has a diverse portfolio of literary criticism, poetry, short fiction, long fiction, creative nonfiction, and magazine articles. When she isn't busy with school, Anna is running and serving as Senior Editor for Her Campus at Seattle University, an online magazine. When she isn't busy with that, Anna enjoys spending time with her German Shepherd, playing Scrabble, and contemplating the complexities of life.

Christopher Stevens is a third-year student in the School of Arts and Sciences. He is a Psychology Major with a minor in Creative Writing, and he finds language fascinating from both the cultural and grammatical perspectives. Although he has been writing creatively and academically for years, SUURJ was Christopher's first experience working with an academic journal. Even though he was unable to work on the journal for all three quarters, the work that he did participate in was both rewarding and informative, and it has benefitted his personal, creative, and academic writing.

Faculty Content Editors

Saheed Adejumbi, PhD, has been at Seattle University since 2005. He specializes in African and African American history, and African Diaspora intellectual and cultural traditions. He is the author of *The History of Ethiopia*, a contribution to Greenwood Press History of Modern Nations Series.

June Johnson Bube is an associate professor in the English Department and Director of Writing Studies. She holds a BA in English and an MA in education from Stanford University, an MA in English from Mills College, and a PhD in mid-nineteenth century American women's writing from the University of Washington. In her Americanist field, she has published articles on women's alternative fictions about the West. In Writing Studies, she has authored *Global Issues, Local Arguments*, an argument reader and rhetoric that focuses on civic literacy and that provides a cross-curricular introduction to global problems. She has co-authored two other writing textbooks: *The Allyn and Bacon Guide to Writing*, a writing-across-the-curriculum rhetoric, and *Writing Arguments*, a leading argument text. Her recent scholarship published in *College English* and the *Journal of Teaching Writing* focuses on her current interest in global studies, argumentation, collaborative rhetoric, and civic engagement. She serves on the SUURJ Faculty Advisory Board and was also a Content Editor for Brandon McWilliams' essay.

Vladimir Dashkeev is an assistant professor of economics at the Albers School of Business and Economics at Seattle University. His research focuses on fiscal policy in open economies. Vladimir's recent studies investigate the effects of asymmetric balanced-budget rules and tax system heterogeneity on interregional risk sharing in a fiscal union. Prior to earning his PhD degree from the University of Washington, Vladimir was a research fellow at the Gaidar Institute for Economic Policy, where he had the honor of working alongside Yegor Gaidar. Assisting Gaidar in his research, which was published as the books *Collapse of an Empire* and *Russia: A Long View*, was a memorable period of Vladimir's career at the institute.

Rob Eford is a professor of Anthropology and Asian Studies in the Department of Anthropology and Sociology. He worked with Wailana Medeiros on her essay, "How the 2019 Mauna Kea Protest Movement Sparked a Hawaiian Cultural Renaissance: a Mini-Ethnography."

Kendall Fisher is an Assistant Professor of Philosophy at Seattle University. She specializes in the history of Medieval philosophy, and her research focuses on the metaphysics and natural philosophy of St. Thomas Aquinas. She also has scholarly and teaching interests in Classical Islamic philosophy, Early Modern European philosophy, and the history and philosophy of science. She received her PhD from Syracuse University in 2017. Her work has been published in *Quaestiones Quodlibetales*, *The Thomist*, and the *British Journal for the History of Philosophy*. She served as the faculty content editor for Sahil Bathija's paper, "Inclusion and Exclusion in Medieval European Craft Guilds."

Tanya Hayes, PhD, is professor and director of the Environmental Studies program and the Institute of Public Service. She teaches research methods, environmental policy, and directs the senior capstone projects. Dr. Hayes's expertise is in policy and program evaluation, specifically in how international environmental policies impact community resource management and livelihoods in low-income countries. Her research examines programs to support environmental conservation and sustainable development in countries throughout Latin America: Honduras, Nicaragua, Colombia, Peru and Ecuador. Her previous work examined the impacts of different protected area policies on forest management and livelihoods in indigenous communities. Her more recent work examines the social and behavioral impacts of Payment for Environmental Services (PES), and related incentive-based conservation policies. Dr. Hayes has authored over fifteen publications. Her recent work can be found in *World Development*, *Land Use Policy*, and *Environmental Science and Policy*. She served as Monica McKeown's faculty content editor.

Molly Clark Hillard, PhD, is an Associate Professor in the English department, where she specializes in Victorian literature. She is the founding Chief Faculty Editor for SUURJ, and she is very grateful for the excellent work that the Volume 5 team has accomplished. She is the author of *Spellbound: The Fairy Tale and the Victorians* (Ohio State University Press, 2014), and a book under contract with Bloomsbury Press, titled *Literary Subjects: the Contemporary Novel and the Return to Victorian Form*. She also enjoys working as a freelance writer, scriptwriter, and editor for various companies and organizations. She served as the Content Editor for Neha Hazra's essay in this volume.

Nova Robinson is an Associate Professor of History and International Studies at Seattle University. She is currently preparing her book manuscript *Truly Sisters: Arab Women and International Women's Rights* for publication. She is also co-editor with Bonnie G. Smith of the *Routledge Global History of Feminism*.

Daniel Smith, PhD, graduated from the University of Minnesota with a BS in Microbiology. He went on to study the biochemistry and genetics of social bacteria, earning his PhD from the University of Minnesota. A postdoctoral position followed in the Department of Soil Science studying symbiotic root nodule formation by rhizobia. He then went on to teach biochemistry and microbiology at the University of Minnesota, Morris, and subsequently departed for Seattle University where he has been an Associate Professor in the Biology Department since 1998.

Michael Spinetta, PhD, is an associate professor of Psychology, with a doctorate in Behavioral Neuroscience. He is particularly interested in learning, memory, and psychopharmacology, with an emphasis on the consolidation and reconsolidation of emotionally salient events and the effects that drugs of abuse and therapeutic drugs have on the learning process, including the formation, storage, and retrieval of memories.

Faculty Advisory Board

Marc A. Cohen, PhD, is a professor with a shared appointment in the Department of Management and the Department of Philosophy. He earned a doctorate in philosophy from the University of Pennsylvania and, prior to joining Seattle University, worked in the banking and management consulting industries. His research concerns trust, moral psychology, management theory, and questions in social and political philosophy about what makes society more than an accidental crowd.

Steven Klee, PhD, is an Associate Professor in the Mathematics Department. He earned a BS in Mathematics from Valparaiso University and a PhD in Mathematics from the University of Washington. Before coming to Seattle University, he spent two years as a visiting postdoc at the University of California, Davis. He is passionate about the value of undergraduate research, working with over 40 students on a range of research projects in discrete mathematics and sports analytics during his time at SU.

Rochelle Lundy, JD, MLIS, is the Scholarly Communication Officer at Seattle University's Lemieux Library and McGoldrick Learning Commons. As a member of the library faculty, she provides guidance on copyright, publishing, and digital scholarship in addition to managing ScholarWorks, the university's institutional repository. She holds a Juris Doctor degree from Columbia University and a Master of Library and Information Science degree from the University of Washington. Prior to her career in libraries, she worked as an attorney specializing in copyright and media litigation.

