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Cover Art: “Asleep”

Kyla Schmitt* (Environmental Science and Humanities)

Looking east, Mount Hood dominates the skyline of northwestern Oregon. White-capped or craggy brown, it looms above the sprawling urban streets, the winding Sandy River, the fir trees, the railroads, the fireweed and false Solomon’s seal. Though none of us are old enough to remember the last time Mount Hood shook the state with an eruption, the ancient networks of alpine forests and meadows sowed by fire remind us: the mountain is not dormant, just asleep.

Medium: *Digital photography, Nikon D3200, AF-S DX Zoom-NIKKOR 18-55mm f/3.5-5.6G ED II lens. Raw. Edited with darktable.*

*Kyla Schmitt is a second-year Clark Honors College student majoring in environmental science and humanities and minoring in English and economics. She is a member of the OURJ editorial board, and after the call for art for the Summer 2022 Issue garnered no external submissions, she decided to anonymously submit a few photographs to help ornament the issue. In addition to working with OURJ, Kyla is a peer mentor with Affiliated Students for Undergraduate Research and Engagement, the treasurer of the UO Society of Ecological Restoration, and a research assistant at the Ocean and Ice Lab. Last spring, Kyla received the FYRE grant to fund her independent research, which focuses on characterizing signal crayfish populations in Tryon Creek. Beyond academics, Kyla loves hiking and exploring, curating her dozens of Spotify playlists, working out, and caring for her houseplants.

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Letter from the Editors

Taylor Sarah Ginieczki* (Political Science and Global Studies), Jay Taylor** (Linguistics and Computer Science), Kyla Schmitt*** (Environmental Science and Humanities)

TAYLOR SARAH GINIECZKI—LOOKING BACKWARD: A YEAR IN (PEER) REVIEW

In more ways than one, our 2021–2022 school year set major records. In the fall, the most students to ever attend the UO matriculated as Ducks. In the spring, Eugene received so much rain that April was the 7th-wettest ever recorded (I never said that every new record was a good one). Best of all, in the summer, OURJ received more submissions for this Summer 2022 Issue than ever before — nearly tripled from our previous issue just six months prior — and now publishes 10 of them, the most articles we have ever published in an issue.

Yet OURJ's new records can be attributed to far more than just good luck. Rather, they have been brought about with extraordinary efforts from the OURJ team — from our student peer editors and outreach coordinator to the UO faculty, librarians, and administrators who support us. Frequent meetings in the DREAM Lab resulted in OURJ re-establishing relationships with other student research groups, including the Undergraduate Research Symposium (URS) and the Affiliated Students for Undergraduate Research and Engagement (ASURE); expanding our student team by threefold; and co-hosting a national conference with the National Undergraduate Consortium on Science Journalism (NUCSJ). Editors worked tirelessly on manuscripts while abroad in countries like Mexico, Costa Rica, Ecuador, India, Switzerland, Ireland, and France. And for the first time, every member of our team is compensated for their work, thanks to the advocacy of OURJ leadership and the generosity of the UO Libraries.

Having graduated from the UO this past spring, I now hand off the journal to Jay and Kyla for the coming

*Taylor Sarah Ginieczki earned her BA in political science and global studies in June 2022, graduating from the UO Summa Cum Laude. Her undergraduate projects included co-authoring a paper on IR realist theory with Dr. Craig Parsons of the UO PS department, co-organizing the 2022 National Undergraduate Conference on Scientific Journalism, and writing an award-winning political science honors thesis on Sino-American nuclear relations. While Taylor specialized in international relations, she also studied Spanish, French, and the digital humanities, and she aspires toward a career at the intersection of research, digital scholarship, communications, and publishing. Her roles with OURJ included being an author, editor, and Editor-in-Chief, and she led the journal from summer 2021 through summer 2022.

**Jay Taylor is a junior at UO majoring in linguistics and computer science and minoring in Spanish and Korean. They have served as the Financial Coordinator for the University of Oregon LGBTQA3 office and co-president of the UO Model United Nations club. They recently discovered a strong interest in research and presented on the topic of mental health in South Korea at the 2020 Oregon Undergraduate Research Symposium. They are passionate about learning new languages and teaching, and they hope to make the world a better place through education for all ages and individuals, regardless of background. In their downtime, they enjoy video games, hiking, and playing board games with friends.

***Kyla Schmitt is a second-year Clark Honors College student majoring in environmental science and humanities and minoring in English and economics. In addition to working with OURJ, Kyla is a peer mentor with Affiliated Students for Undergraduate Research and Engagement, the treasurer of the UO Society of Ecological Restoration, and a research assistant at the Ocean and Ice Lab. Last spring, Kyla received the FYRE grant to fund her independent research, which focuses on characterizing signal crayfish populations in Tryon Creek. Beyond academics, Kyla loves hiking and exploring, curating her dozens of Spotify playlists, working out, and caring for her houseplants.

year. I leave OURJ in incredibly capable hands, and I very much look forward to seeing them put their coordinated brilliance into action, now with the platform to truly do so. It is with joy and faith in this amazing team that I introduce this issue of OURJ and welcome their new leadership, and I eagerly look ahead to what records OURJ will break next.

JAY TAYLOR AND KYLA SCHMITT—LOOKING FORWARD: THE FUTURE OF OURJ

It would be improper to discuss our plans for the future without acknowledging the efforts it took to get to this point. After COVID-19 hit, OURJ's editorial capacity declined substantially, leaving the journal with only three students on the editorial team as of winter 2022. Taylor's tireless work to rebuild OURJ—from recruiting editors to tackling every bump in the publication process—has provided us a stable foundation from which to grow going forward. While Taylor's fantastic contributions will be sorely missed, we know her work will be best commemorated in the continuing success and growth of OURJ.

As the number of submissions we receive has steadily increased, so has the number of staff needed to keep the publication cycle running smoothly. OURJ has come to a crossroads: we want to continue receiving more submissions while lacking the organizational structure to support this growth. To address this, we are taking several steps to streamline OURJ processes at an individual and organizational level. Internally, we will improve the editorial onboarding process, streamline the content and copy-editing processes, and find new ways to connect with researchers on campus. Externally, we will increase the accessibility of our stylistic standards and submission guidelines; demonstrate greater involvement on campus through workshops, conferences, and events; and adhere to more regular and predictable publication cycles. We hope that by strengthening the foundations of OURJ, the journal may better serve the ever-growing undergraduate research community at the UO.

Going forward, we are excited to see OURJ reach maturity as a peer-reviewed publication and thrilled to be a part of its development. With two acting Editor-in-Chiefs, we can continue publishing accessible, high-quality research while securing the future of OURJ as the flagship undergraduate journal of the University of Oregon. Our current editorial team of strong-willed, talented individuals allows us to boldly take on new challenges, and we are confident that our capacity to do so will only grow. We thank you for your engagement thus far and invite you to stay involved with OURJ throughout the 2022–2023 academic year and beyond.

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Journal Editorial: "UO Libraries Supports New U.S. Policy Making Research Results Available Immediately"

Alicia M. Salaz* (Vice Provost and University Librarian, University of Oregon Libraries)

The letter below was written to the White House Office of Science and Technology Policy in response to its August 2022 memorandum establishing new federal policy on public access to the products of publicly funded research. At the University of Oregon, our students benefit from access to the widest possible range of newly published scholarly information through our Library's subscriptions and e-resource collections. This access costs millions of dollars annually, much of it paid to the private, for-profit companies who collect and publish research. Many members of the public—including students at less well-funded institutions; high school students and K12 teachers; and curious learners unaffiliated with any university—lack the ability to read and learn from the latest scientific and medical information because the subscriptions are so unaffordable. This lack of access hinders scientific progress and is particularly unfair when considering that the public funds the underlying research activity through their tax dollars. The OSTP's updated policy will ensure that when the government funds research—by providing grants to buy equipment, materials, hire researchers, run analyses, and more—that the findings from that research are immediately returned to the public for their benefit. We hope that this policy also means that the UO Library will be able to spend less every year on paying for these subscriptions, which will enable us to invest more directly in our students, faculty, and their important teaching and research work. We are proud to support the Oregon Undergraduate Research Journal as an open scholarly communications forum that undergraduates everywhere can read without cost. The UO and its Libraries will continue to advocate strongly for a fair and inclusive research communications system that everyone can afford to participate in.

Dear President Biden and Dr. Nelson,

On behalf of University of Oregon Libraries, I write today to extend our sincere gratitude and appreciation for the updated policy guidance issued by the White House Office of Science and Technology Policy (OSTP) that will make taxpayer-funded research immediately available for the public to freely access and fully use. We applaud the administration for eliminating the current 12-month embargo on access to critical research outputs—both articles and data.

*Alicia M. Salaz was appointed Vice Provost and University Librarian for the University of Oregon in 2021. From 2013–2021, she held faculty roles at Carnegie Mellon University, culminating in an administrative appointment as Associate Dean for Research and Academic Services within the University Libraries. Her research and professional interests lie in the area of adult learning and reading formats, whether print or digital, as well as transnational higher education, international library and information practice and scholarly communications infrastructure. She has engaged in global research partnerships pertaining to reading format preference and worked for over ten years in the Arab Gulf at both a public institution in the United Arab Emirates and at Carnegie Mellon's international branch campus in Doha, Qatar. During her time abroad, she served as chair of the board of directors for the Information Literacy Network of the Gulf and remains passionate about information education and capacity-building in this area for information practitioners around the globe.

At the University of Oregon, a public R1, AAU institution, our scholars rely on access to the latest published and publicly funded research and data in critical areas such as climate, human performance, and children's health, to produce 2,000 publications and petabytes of research data every year. Our Library spends millions of dollars of Oregon state tax dollars and student tuition dollars every year to buy back access to the research that our own faculty produce with federal dollars, because until now, we have had little choice.

With this action, OSTP advances a fairer, more equitable system of research that will benefit UO, our faculty, students, Oregon taxpayers, our country, and the world. Instead of buying back access to research that was already produced with public money, we will be able to invest more of our limited resources in ways that directly accelerate the research enterprise at the UO. The result will be faster progress toward solving behavioral health crises, mitigating climate and wildfire risks, and improving the human condition.

This policy guidance is the culmination of more than 15 years of steady progress. It provides a much-needed update to strengthen U.S. policy that will bring our country to equal footing with governments across the world that have established strong open access policies to promote their national innovation agendas.

We thank you for your steadfast leadership on this issue and stand ready to work with our community and your administration to support and implement this important policy guidance.

Sincerely,

Dr. Alicia M. Salaz

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Art Feature: "Canopies, Cascades, and Canyons"

Kyla Schmitt* (Environmental Science and Humanities)

During the summer of 2022, my travels—for environmental fieldwork and vacations alike—took me all across Oregon's Cascade Range, from the North Santiam Canyon to Mount Bachelor. Whether the skies were misty or blue, whether the forests old-growth or young, I always found myself in awe of the sweeping landscapes and the lush stands that punctuate them. These photographs aim to capture just a few of the awe-inspiring sceneries I had the privilege of experiencing.

Medium: *Digital photography, Nikon D3200, AF-S DX Zoom-NIKKOR 18-55mm f/3.5-5.6G ED II lens. Raw. Edited with darktable.*

*Kyla Schmitt is a second-year Clark Honors College student majoring in environmental science and humanities and minoring in English and economics. She is a member of the OURJ editorial board, and after the call for art for the Summer 2022 Issue garnered no external submissions, she decided to anonymously submit a few photographs to help ornament the issue. In addition to working with OURJ, Kyla is a peer mentor with Affiliated Students for Undergraduate Research and Engagement, the treasurer of the UO Society of Ecological Restoration, and a research assistant at the Ocean and Ice Lab. Last spring, Kyla received the FYRE grant to fund her independent research, which focuses on characterizing signal crayfish populations in Tryon Creek. Beyond academics, Kyla loves hiking and exploring, curating her dozens of Spotify playlists, working out, and caring for her houseplants.

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Meet the Editorial Board

SARAH BEAUDOIN

Sarah Beaudoin is currently in her senior year in the Clark Honors College, majoring in chemistry and also studying biology and science communication. Outside of classes, she lives in a sustainability-based and multigenerational co-op, volunteers for campus organizations such as the Climate Justice League and in the larger community of Eugene, and does research in the Boettcher Lab. In the lab, Sarah conducts electrochemical and physical chemistry experiments to better understand water electrolysis with the hopes of producing hydrogen fuel to mitigate the need for fossil fuels. Sarah is originally from rural Enterprise, Oregon, and enjoys biking, gardening, sewing, backpacking, and ceramics in her free time.

HALEY WALLACE

Haley Wallace is a junior at the UO, majoring in English. In addition to her time spent editing for OURJ, she is on the editorial board for UO's *Unbound Journal*. She is also a member of the Sigma Tau Delta International English Honor Society. Outside of her time on campus, she works full time as a freelance book editor. In any spare time she can gather up, she finds herself reading, taking hiking trips with her husband, spending time with their cats, and playing video games.

ALEX AGHDAEI

Alex Aghdaei is a freshman at the UO majoring in data science and political science. Much of his academic and career interests have revolved around his past involvement in local and statewide campaigns and work as a communications analyst for Stand for Children. His research interests revolve around the application of statistical methods with an emphasis on comparative history and international relations, including a recent focus on applying natural language processing. Outside of academics, Alex is an avid ultrarunner/mountaineer, amateur game developer, and proud dog dad of a miniature Australian shepherd named Sofie.

TEAGAN FURBISH

Teagan Furbish is a Clark Honors College senior majoring in Biochemistry and specializing in plant molecular biology. Passionate about discovery in and preservation of our ecosystems, Teagan has worked on research projects spanning from landscape ecology to electrochemistry. Currently, she is working to engineer proteins for artificial gene expression in chloroplasts. With a deep interest in science communication, she hopes to use oral and graphical means to relay the findings of complicated studies to people of all academic specializations. Toward this end, she helped to found the "Climate Justice Network" podcast at UO. Extracurricularly, Teagan leads rock-climbing education trips for women, competes as a part of the UO climbing team, and teaches yoga. In her free time, Teagan loves to read, embroider, slackline, swim, and explore the outdoors.

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NICOLE MULLEN

Nicole Mullen is a senior Neuroscience major in the Clark Honors College. With minors in Ethics and Chemistry, Nicole is fascinated by everything from education and scientific ethics to bacterial chemical communication and its effect on the development of neurons. She received a FYRE grant to develop curriculum for K-12 students focusing on public health ethics during the COVID-19 pandemic and is currently a researcher focusing on the impact of microbial systems on neuronal development. Nicole also serves as a Leadership and Community Engagement Program Assistant at the Holden Center, loves competing as a member of the UO Rock Climbing Team, and leads the UO Out in STEM club. Post-graduation, Nicole hopes to work as a scientific researcher in Berlin, Germany before attending graduate school in the U.S. In the meantime, you can find her gardening, making maps of the fruit around Eugene, swimming, and running.

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Art Feature: "Loss and Regrowth"

Kyla Schmitt* (Environmental Science and Humanities)

During a recent job as a field technician, I spent time in the burn area of the Beachie Creek Fire, which struck the Lyons-Detroit corridor in August 2020. The fire burned nearly 200,000 acres of old-growth forest, and countless people lost their homes. In the two years that have passed since the incident, however, the scarred hills have gradually grown brighter as foxgloves and other early-successional flora take hold. While wildfires can have devastating effects on human populations—effects that I do not at all intend to diminish—wildfires are a natural part of Oregon's landscape, and they open up ecological niches for a plethora of wonderful meadow species that cannot tolerate the shady conditions created by old-growth canopies. This photo juxtaposes the human cost of wildfires—embodied by the abandoned, rusted trailer—with the ecological rejuvenation of open skies and ash-rich soil.

Medium: *Digital photography, Nikon D3200, AF-S DX Zoom-NIKKOR 18-55mm f/3.5-5.6G ED II lens. Raw. Edited with darktable.*

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Colombian Counterpoint: Transculturation in Sibundoy Valley Ethnohistory

Rowan F. F. Glass* (Anthropology)

ABSTRACT

Anthropological and historical scholarship on cultural change in colonially subordinated cultures has often stressed deculturation—cultural loss and degradation—as a consequence of colonialism. This paper disputes that narrative by presenting the case of Indigenous cultural change in the Sibundoy Valley of southwest Colombia from an ethnohistorical perspective. Drawing on historical, ethnographic, and theoretical texts and relying on the concept of transculturation—understood as a complex process of partial loss, partial gain, and the creation of new cultural phenomena from intercultural encounters—as a more nuanced alternative to deculturation, I outline the history of cultural change in the valley from the prehispanic period to the present. While recognizing that colonialism had catastrophic effects on the Indigenous communities of the valley, I also suggest that these communities' deep historical experiences with transculturation in the prehispanic era enabled the preservation and rearticulation of core elements of Indigenous cultures in the post-contact period. That transcultural experience allowed for the incorporation of foreign, colonially imposed cultural elements into the pre-existing cultural framework of the valley. The historical continuity of the transcultural experience in the valley demonstrates that its Indigenous communities have not been passive subjects of colonial power, but rather active agents in negotiating and mitigating its deculturating effects. This approach emphasizes the historical agency of the Indigenous peoples of the Sibundoy Valley as the central protagonists and makers of their own history. I conclude by suggesting the broader applicability of this perspective to other situations of cultural change in colonial and postcolonial contexts.

1. INTRODUCTION

The question of how cultures change as a result of contact and exchange with others, particularly in situations of power imbalance, is one that has animated much discussion in anthropology, history, and related fields. Despite theoretical advancements in recent decades, much of the scholarship addressing issues of intercultural contact and transformation, especially in colonial situations, retains an anachronistic focus on the deculturation—that is, cultural loss and degradation—of subordinated cultures. This approach tends to emphasize processes of assimilation in intercultural situations rather than counter-practices of mediation, accommodation, and resistance. To focus on loss over adaptation minimizes the historical agency of subordinated cultures and obscures a view of the ways in which they preserve and rearticulate elements of their

*Rowan Glass is a senior undergraduate student majoring in cultural anthropology and minoring in history and Latin American studies at the University of Oregon. His research focuses on cultural reproduction and territorial autonomy among the Kamëntsá people of the Sibundoy Valley in southwest Colombia. Through activist anthropology in collaboration with communities in the Sibundoy Valley, Rowan hopes to bring attention to Indigenous issues that are often overlooked. Aside from his ethnographic commitments, Rowan is also interested in creative writing and is a writer and editor for Unbound Journal and The Student Insurgent, both student-run publications at the University of Oregon. Please direct correspondence to rowang@uoregon.edu.

traditional cultures under the pressures of external cultural impositions. Such erasure is commonly expressed in the popular misconception that Indigenous peoples and other subordinated groups have all but entirely disappeared or assimilated to dominant cultures and that little of their own cultures now remains.

This study presents the case of Indigenous[1] transculturation in the Sibundoy Valley of southwest Colombia in order to dispute the claim that cultural change must entail the destruction and subsequent replacement of subordinated cultures by dominating ones. A more historically sound and socially just interpretation of cultural change is one that, without minimizing the traumas of colonialism, centers the ways in which subordinated cultures mediate and mitigate its effects by selectively adapting certain colonially imposed cultural elements while preserving and rearticulating Indigenous ones in novel and resilient ways. This is precisely what occurred in the Sibundoy Valley. I employ the term "transculturation" to describe the complex process of cultural change—partial loss, partial gain, and the creation of new cultural phenomena—as it operated in the Sibundoy Valley both before and after the colonial encounter in 1535.[2] I suggest that the Sibundoy Valley provides an exemplary case study of transculturation and cultural resilience among colonized cultures in general.

As an ethnohistory, this study employs historical, ethnographic, and Indigenous sources in interpreting transculturation as it has operated at various points and in different cultural domains in the prehispanic, colonial, and contemporary history of the Sibundoy Valley. I begin by exploring the prehispanic history of transculturation in and around the Sibundoy Valley by examining processes of trade, mobility, and cultural borrowing in domains such as religion, shamanism, and ethnobotany. My analysis suggests that the adaptive mechanisms that enabled cultural survival following the colonial encounter were inscribed at an early date in the Indigenous cultures of the valley by transcultural experiences in the deep past. I then use two colonial-era primary sources to examine transculturation in the wake of the colonial encounter, focusing on the emergence of a syncretic Catholicism overlaying Indigenous religious substrata, the incorporation of foreign elements into the Indigenous mythic corpus, and Indigenous adaptations to colonial legal forms. Finally, I turn my attention to transculturation as it occurred in the most transformative phase of colonialism in the valley: the Capuchin mission of the twentieth century. In this period of intense repression—which also witnessed the rapid colonization of the valley by White and mestizo settlers from other regions of Colombia—Indigenous cultures underwent a process of cultural concealment and rearticulation under the semantic overlay of colonial culture.

[1] Terminology concerning the Indigenous peoples of the Americas is fraught with controversy. Considering the (mis)use of terms such as "native" in the classic literature of anthropology and other fields—and at the cost of redundancy—I opt exclusively for the term "Indigenous." "Indigenous" here refers collectively to the two autochthonous ethnic groups to inhabit the Sibundoy Valley since prehispanic times, the Inga and the Kamëntšá, and other autochthonous ethnicities of the broader region. When a particular group is being discussed, its proper name is used to distinguish it from the collective "Indigenous." For stylistic diversity and sentence flow, the Spanish term *indígenas*, a plural noun meaning "Indigenous people," is also sometimes used. In most cases, "Indigenous" is treated as an adjective, while indígenas acts as a collective noun. Use of the Spanish term is to avoid the cumbersome and redundant "Indigenous peoples."

[2] "The colonial encounter" may be understood, on the one hand, as the historically determinate moment of contact between Europeans and Indigenous peoples in which the former positioned themselves as superior to the latter within the colonial system they were constructing in the Americas; and, on the other, as an ever-present colonialism that continues unfolding in sites of encounter between colonizers and colonized in the present. Hence, in the first case we can speak of an "after"; not so in the second, in which the colonial encounter is an "always." In this study, the term is generally meant in the first sense, but without detracting from the importance of the second as a historical through line in the Sibundoy Valley and other sites subject to ongoing colonialism.

Before broaching an analysis of Indigenous transculturation in the Sibundoy Valley, it is necessary to briefly contextualize the area of study, its cultures, and its history. The following section provides a geographic, ethnographic, and historical profile of the Sibundoy Valley. I then review the historical, ethnographic, and theoretical literature on which this study is based. My analysis follows the literature review.

1.1. GEOGRAPHIC, ETHNOGRAPHIC, AND HISTORICAL CONTEXT

The Sibundoy Valley is a small basin situated at an elevation of 2,200 meters on the Andes-Amazon piedmont of southwest Colombia. To the valley's west, over the cold rim of the Andes and beyond the volcanic La Cocha Lagoon, lies the city of Pasto in the Andean highlands; to its east, in the foothills of the Colombian Massif, sits the city of Mocoa in the Amazonian lowlands. Mocoa is the capital of Putumayo Department, of which the Sibundoy Valley constitutes the uppermost region.[3] From the slopes overlooking the valley spring the headwaters of the Putumayo River, which streams down the piedmont into the lowlands, flowing for 1,800 kilometers before joining the Amazon River in the heart of the Brazilian rainforest. The ecology of the valley is essentially Andean, although proximity to the Amazon and a history of intercultural exchange across the piedmont have brought several Amazonian plant species into cultivation in the Sibundoy Valley. Until the late twentieth century, the valley floor was marshy and subject to occasional floods, but land reclamation projects undertaken throughout the twentieth century by the Capuchins and their successors have transformed the former wetlands into agricultural fields and pastureland for cattle (Bonilla, 1968; Cabildo de Indígenas, 1989).

The prehispanic history of the valley remains murky for lack of written records, but ethnohistorical sources indicate that for millennia the valley has been the site of encounters between various Indigenous groups from across the Andes-Amazon piedmont and beyond. As a crossroads between the highlands to the west and the lowlands to the east, the Sibundoy Valley was a central link in the routes of trade and mobility that have traversed the region from time immemorial. Ethnographic and historical evidence suggests that the Indigenous groups of the valley were vital actors and intermediaries in these routes, routinely traveling long distances and engaging with numerous and diverse other groups (Bonilla, 1968; Cipolletti, 1988; Dueñas et al., 2016; Gómez, 2006; McDowell, 1989, 1992, 1994; Ramírez, 1996; Ramírez & Castaño, 1992; Taussig, 1987).

Two distinct Indigenous communities have resided in the valley since prehispanic times: the Kamëntšá or Kamsá,[4] who speak a language isolate possibly related to the extinct languages of the prehispanic Quillasinga federation (McDowell, 1992, p. 96; 1994, p. 10; Ramírez & Castaño, 1992, p. 292), and the Inga or Inganos, speakers of the northernmost extant dialect of Quechua, the language of the Inka Empire.[5] It is generally accepted that the Kamëntšá constitute the original inhabitants of the Sibundoy Valley, while the Inga are probably the descendants of Quechua-speaking groups that migrated into the valley from the Amazonian lowlands to the east, although some also ascribe lowland origins to the Kamëntšá (Bolaños, 2017; Bonilla, 1968; Cabildo de Indígenas, 1989; Gómez, 2006; McDowell, 1989,

[3] The Sibundoy Valley is coextensive with the *Alto Putumayo*, or "Upper Putumayo," the high-elevation Andean region of Putumayo Department. The greater part of the department is occupied by the warm and humid Amazonian lowlands surrounding the course of the Putumayo River as it flows down from its Andean source.

[4] Other spellings and names for this group include: Kamëntsá, Camsá, Camëntsá, Coche, and Sibundoy, among others; the latter two are frequent in early literature but are now considered pejorative and antiquated.

[5] Specifically, the Inga of the Sibundoy Valley speak Highland Inga, distinguished from Jungle Inga as spoken in neighboring lowlands. Even more specifically, Highland Inga varies between Inga communities within the valley; it is not spoken precisely the same in Santiago as in neighboring San Andrés (J. E. Wolf, personal communication, May 9, 2022).

1992; Ramírez, 1996; Ramírez & Castaño, 1992; Seijas, 1969). The San Pedro River, which bisects the valley from north to south, is traditionally seen as the boundary marker between the Inga to the west and the Kamëntšá to the east (Chindoy, 2021, p. xv). Although the Inga and Kamëntšá speak different languages and have different origins, centuries of cohabitation in the confined space of the Sibundoy Valley have resulted in an atmosphere of interculturality between the two groups. For example, intermarriage between both groups is frequent, and it is not uncommon that members of one community speak, to some degree, the language of the other. Nonetheless, the communities are distinct in other respects.[6]

The Sibundoy Valley was subject to only occasional visits by Spanish administrators and missionaries throughout the colonial period, beginning with the "discovery" of the valley by lieutenants of the conquistador Sebastián de Benalcázar in 1535 and later continuing with the crossing of the valley by the conquistador Hernán Pérez de Quesada in 1542 during his ill-fated search for El Dorado (Bonilla, 1968; Chindoy, 2021; Taussig, 1987). Its geographic isolation, however, allowed it to remain peripheral to the colonial system[7] and nearly empty of foreign presence until the late republican period.[8] Apart from the occasional visits of priests and tax collectors from colonial centers such as Pasto and Mocoa, the Sibundoy Valley was by and large left alone until the turn of the twentieth century. Despite its relative isolation, partial Christianization and sporadic contact throughout the colonial period saw the development of a syncretic Catholicism and other transcultural processes in the valley, as evinced by oral tradition and surviving documents dating to the colonial era.

The isolation of the Sibundoy Valley ended with the advent of the Capuchins. In the last decade of the nineteenth century and the first of the twentieth century, the Capuchin Order became the last of the missionary orders to establish themselves in the Sibundoy Valley, doing so with much greater success and longevity than their predecessors. The first Capuchin missionaries to work in the Sibundoy Valley arrived in 1899, having been granted by state decree governing powers over the frontier territories of the Putumayo and Caquetá, and in 1904 the Apostolic Prefecture of the Caquetá and Putumayo was formally established, cementing Capuchin authority on the Amazonian frontier (Restrepo, 2006). Called by some a "state within a state" (Bonilla, 1968), the mission had its headquarters in the Sibundoy Valley, from whose commanding heights the Capuchins could look down upon the vast Amazonian lowlands that

[6] During my fieldwork in the Sibundoy Valley in the summer of 2022, I heard frequent reference to the "brotherhood" (*hermandad*) considered to exist between the Inga and Kamëntšá, and many of my collaborators belonged to mixed Inga-Kamëntšá families. Many surnames, or similar variants, are also shared between both communities. Points of differentiation other than language, on the other hand, include art, symbolism, philosophical concepts, openness to engage with outsiders, and predilection (pronounced among the Inga) to travel, among others. I was also told that in former times, non-violent territorial disputes and petty discrimination were common between both groups, but their sense of "brotherhood" was strengthened by their shared experience of colonization and dispossession under the Capuchins.

[7] In Latin American historiography, it is usual to distinguish between the (Spanish) colonial period and the post-independence or republican period. While I acknowledge the validity of that distinction as regards high-level government, in this paper I refer to the Colombian state, Catholic Church, and colono settlers as colonial agents, bearing in mind that the colonization of the Sibundoy Valley—and numerous other regions of modern-day Colombia that were never effectively under the control of the Spanish Empire—occurred in the post-independence period. The "colonial system" here refers to mainstream Colombian society, with its Spanish-speaking, Catholic, Eurocentric, and racially *mestizo* and *criollo* connotations. In effect, the post-independence period saw a pivot from external to internal colonialism.

[8] Although there was no sustained foreign presence in the valley until the twentieth century, it was nonetheless part of the encomienda system from an early date: "The *Archivo General de Indias de Sevilla* says that on November 25, 1570, there were 1,371 'tributary Indians' in Sibundoy, suggesting that Spaniards frequently traveled to Sibundoy to collect tributes but did not remain there" (Chindoy, 2021, p. 4). Apart from the sporadic rounds of colonial officials, the only foreigners to visit the valley were missionaries of the short-lived pre-Capuchin missions and the occasional priest from Pasto or Mocoa (Bonilla, 1968).

were on paper—if not truly in practice—under their jurisdiction.

Having been delegated governing powers by a state that was itself largely absent from the region, the Capuchins quickly established themselves as the highest political authorities on the Putumayo frontier. The 70-year rule of the Capuchins initiated a process of colonization that saw the rapid dispossession of Indigenous lands by the mission, an influx of non-Indigenous settlers (*colonos*)[9] from other regions of Colombia, and systematic efforts on the part of the Capuchins to deculturate[10] the Indigenous inhabitants of the valley while encouraging assimilation to the forcibly imposed and mutually reinforcing institutions of orthodox Catholicism and Colombian national identity. The first step taken by the Capuchins in establishing their new mission was to build a network of schools and churches. In the mission schools, Indigenous children would learn to speak Spanish, while speaking Indigenous languages was strictly forbidden and harshly punished. They were taught to sing the national anthem, to dress and behave like their White and mestizo classmates, and to identify as Colombian before Indigenous. The avowed goal of the Capuchins was to "civilize the savages" through conversion to Christianity, violent discouragement of the practice of Indigenous customs, and schooling according to a Western model (Bonilla, 1968; Gómez, 2005; Sandoval Zapata & Lasso Otaya, 2014; Triana, 1950).

Meanwhile, a series of roads commissioned in the early twentieth century by the Colombian state, supervised in their construction by the Capuchins and built by Indigenous forced labor, connected the Sibundoy Valley to mainstream Colombian society for the first time, opening the valley to large-scale settlement by colonos, who soon outnumbered the Indigenous population; settler populations steadily rose while Indigenous populations declined due to out-migration, disease, loss of livelihood, and even mass suicide (Bonilla, 1968; Gómez, 2011; Smith, 1957; Uribe, 2011, 2019). By the time of the mission's decline, most Indigenous families had been displaced from the most productive lands of the central valley to the less fertile slopes of the valley's periphery, leaving their former holdings in the hands of the mission and the colonos who now outnumbered them. The Capuchins maintained their grip on power until 1969, after which the missionaries were forced to withdraw by a combination of popular and state opposition[11] (Bonilla, 1968; Cabildo de Indígenas, 1989; Gómez, 2005, 2011; Restrepo, 2006; Sandoval Zapata & Lasso Otaya, 2014; Uribe, 2011, 2019). Since then, the Indigenous communities have made significant gains in securing legal protections and the reclamation of stolen land, although much remains to be done ("Termina una disputa," 2016).

Despite the repression of the Capuchin period and the nearly 400 years of intermittent colonial rule that preceded it, the Indigenous peoples of the Sibundoy Valley have long succeeded in meeting the challenges of transculturation by incorporating cultural elements imposed by colonialism while preserving and rearticulating elements of their own. An understanding of the ways in which Indigenous communities have

[9] Colonos are frequently referred to as "Whites" (*blancos*) in the literature, but as Seijas points out, skin color is not a reliable indicator of ethnicity, and most "Whites" in the Sibundoy Valley were mestizos (1969, p. 14).

[10] *Deculturation*, meaning the process of cultural loss and degradation associated with colonialism and its efforts to strip Indigenous people of their cultures, customs, and languages, is commonly contrasted in the anthropological literature with *acculturation*, meaning the acquisition of a new culture—for example, one imposed by colonialism. *Transculturation*, as I use the term in this paper, highlights the synthetic and creative aspect of intercultural contact, emphasizing that while there may be processes of loss and gain, "the loss is partial and the gain is of new cultural phenomena" (Millington, 2007, p. 263).

[11] The end of the mission came amid mounting opposition following the publication of Víctor Daniel Bonilla's polemical history of the mission, *Siervos de dios y amos de indios* (1968), as well as opposition within the Church, informed by liberation theology, "against the social conservatism of institutional Catholicism" (De Roux, 1992, p. 278).

rearticulated and reproduced themselves through the history of the valley—and in other colonial situations in general—depends on a robust analysis of ethnohistorical sources and theoretical literature.[12] I now turn to a review of the historical, ethnographic, and theoretical literature on which this study is based as way of preface to such an analysis.

2. LITERATURE REVIEW

2.1. HISTORICAL AND ETHNOGRAPHIC LITERATURE

Historical writing on the Sibundoy Valley is scarce prior to the advent of the Capuchins in the early twentieth century. For the first several decades of the mission, most writing on the valley was produced by the missionaries themselves and by travelers and state officials who were complicit in the missionaries' project. Despite the clearly biased agendas informing the written production of colonial agents in this initial period, these texts are of interest to ethnohistorians of the Sibundoy Valley for the data they provide on conditions in the early mission. Escandón (1913) collates various government documents on the mission, while the unattributed *Informes sobre las Misiones del Putumayo* (1916) anthologizes early publications of state and mission officials. Lengthier reports about the activities and travels of individual missionaries are compiled in Recalde (2002). The reports of traveling officials such as Triana (1950) also provide insight into conditions in the nascent Capuchin mission.

The first scholarly writing on the Sibundoy Valley was authored by government archaeologists and ethnographers of the National Archaeological Service, founded in 1938, and the National Ethnological Institute, founded in 1941. Scholarly work of this period produced several ethnographic studies, still limited in depth and objectivity, of the Indigenous peoples of the Sibundoy Valley, while their authors acquired cultural artifacts for display at the newly founded Ethnographic Museum in Bogotá (Chaves, 1945; Friede, 1945; Maldonado, n.d.). Chaves, notably, was the first to critically reflect on the problem of colono settlement and its effects on Indigenous communities in the piedmont and on the rapidly expanding frontier, a primary catalyst of cultural transformation in the region.

Since the 1968 publication of Víctor Daniel Bonilla's seminal history of the Sibundoy Valley, *Siervos de dios y amos de indios*, secondary historical scholarship on the valley has proliferated, especially in the vein of ethnohistory. Gómez, the most prolific historian of the valley, has produced studies of Inga ethnohistory (2006); Capuchin colonization and mechanisms of domination (2005); nation-building, settlement, and extractivism in relation to Indigenous groups (2011); and settler colonialism and urbanization of the piedmont and Amazonian frontier (2015). Restrepo (2006) provides a historical overview and analysis of state-Church relations in southern Colombia, particularly in the Sibundoy Valley, suggesting that the Church was empowered by the state to act as its surrogate in the "joint construction" of national identity in the missions of southern Colombia, a perspective upheld by De Roux (1992) in his overview of the broader national context of state-Church relations. Bolaños (2017), though biased and ahistorical in his apologetic assessment of the missionaries as promoting the

[12] In more than 50 years since the dissolution of the Capuchin mission, the Sibundoy Valley has continued to undergo processes of transculturation and incorporation into the ambit of the Colombian nation-state (Cabildo de Indígenas, 1989). Despite the challenges posed by state expansion, narcotrafficking, extractivism, and development projects that threaten Indigenous sovereignty on multiple fronts, the Indigenous communities of the valley remain resilient in upholding their cultural integrity while continuing to adjust to the challenges of modernity and globalization. I would assert that an understanding of present conditions and future directions in the valley depends on an understanding of local history and the continuities expressed in the contemporary situation there.

survival of Indigenous languages,[13] highlights the importance of mission schools to the Capuchin colonial project. This point is more thoroughly elaborated by Sandoval Zapata and Lasso Otaya (2014), who also analyze Indigenous resistance, basing their interpretive approach on the theoretical framework of Dussel (1995) and employing his concept of "concealment" to describe Indigenous adaptations to the cultural impositions of the Capuchins. Uribe (2011, 2019), drawing on the primary state and Church documents enumerated above, emphasizes road development as a central strategy for the colonization of the piedmont and as one of the primary goals of the Capuchins in their efforts to connect the Sibundoy Valley with urban centers such as Pasto to the west and Mocoa to the east. A contemporary report on the colonization of the Putumayo frontier (Smith, 1957) corroborates Uribe's argument that road development was a primary mechanism of the colonial process, a thesis also developed by Gómez (2005, 2011, 2015).

Mongua Calderón (2020) provides a historical overview of processes of national incorporation and extractivism in the broader Amazonian frontier in the nineteenth century, disputing the dominant interpretation of nineteenth-century Amazonia as a space of isolation and marginality. Ramírez (1996) argues similarly in sketching the *longue durée* history of intercultural contact, mobility, and territorial formations in the Sibundoy Valley and across the piedmont, from prehispanic times through to recent history, "[departing] from the hypothesis that the inhabitants of the Sibundoy Valley have been specialized merchants and intermediaries between the Andes and the jungle since the prehispanic era."[14] This thesis is further developed by Gómez (2006), McDowell (1989, 1994), Taussig (1987), and extended in Ramírez and Castaño (1992). Historical ethnobotanical studies of lowland plant trade also support an understanding of Sibundoy Valley indígenas as longtime traders and intermediaries between the Andes and the Amazon (Cipolletti, 1988; Dueñas et al., 2016), which, in McDowell's view, explains the presence of both Andean and Amazonian substrata in the domains of religion and mythology, suggesting that syncretic and transcultural processes in the valley long predate the colonial encounter. Ramírez and Castaño (1992) extend this point to argue that the historical experience of Sibundoy Valley indígenas with intercultural contact and syncretism[15] in prehispanic times can be interpreted as a "strategy for cultural survival" which enabled the rearticulation of Indigenous cultures following the colonial encounter—an argument central to my own thesis.

Within the ethnographic literature, scholarship on Indigenous cultural change focuses on Catholic syncretism in the domains of religion and myth. Friede (1945) transcribes a prevalent Indigenous legend dating to the Spanish colonial period, that of "Our Lord of Sibundoy," which he and others (Bonilla, 1968; Chindoy, 2020; Juajibioy, 1987, 1989) take as the first instance of Catholic syncretism in the post-conquest history of the valley. McDowell (1989, 1992, 1994) emphasizes continuities and processes of accommodation within syncretic religious systems and mythological traditions, while Ramírez and Castaño (1992) focus on similar processes of syncretic mediation specifically within the shamanic domain. Examples and

[13] Bolaños argues that the work of the missionaries was essential for the preservation of Indigenous cultures and languages in the Sibundoy Valley. All other sources that comment on the matter contradict this assertion, as does my experience interviewing Kamëntšá people who grew up in Capuchin boarding schools, on the basis of which I would characterize Bolaños's argument as biased and ahistorical.

[14] All direct translations from Spanish-language sources are mine.

[15] Syncretism is related to but not synonymous with transculturation. Allatson (2007) defines syncretism: "A term that arose in comparative religious studies, and that has been taken up in anthropological discourse, as well as in performance and other branches of cultural studies, syncretism connotates the binding together and intermingling of distinct religious or cultural practices" (p. 220).

discussion of syncretism in the realms of religion and shamanism are also found in the ethnobotanical work of Schultes (1988; Schultes & Raffauf, 1992) and Bristol (1965), as well as in the ethnomedical work of Seijas (1969).

Several studies focus also on symbolic and religious syncretism within the Indigenous carnival Bëtsknaté, or the *Carnaval del Perdón*, the most important Indigenous festivity in the valley. Castaño (2021) provides photographs, with explanatory notes, of syncretic symbols in the proceedings of the carnival. Quiñones Triana (2019) and Tobar and Gómez (2004) provide more in-depth studies of Bëtsknaté, discussing its history and evolution, including Capuchin attempts to suppress and coopt it. Sandoval Zapata and Lasso Otaya (2014) identify the "concealment" of Indigenous elements in the superficially Catholic elements of the festival, interpreting this process as one of coded resistance. McDowell (1992) discusses the revalorization of the Inga carnival Calusturinda within the context of other cultural preservation efforts, including the bilingualization of education and involvement in national pan-Indigenous movements; he concludes that during the carnival, "the ancestors appear to walk the earth once again, and the modern people renew their contract with the ancestral model" (p. 110), suggesting the importance of this festival for Indigenous cultural reproduction. Aldana Barahona and Sánchez Carballo (2021) interpret the Inga *chumbe*,[16] a type of woven belt bearing pictographic designs and wrapped around the body, in a similar vein, as a synthesis of the traditional and the modern, itself a metaphorical and visual representation of the transcultural experience. Jacanamijoy, likewise, (2014) argues that chumbe pictographs can be read as "books" that tell the history of the Inga.[17]

Ethnobotany is one of the primary cultural domains in which transcultural processes are evident in the Sibundoy Valley. Richard Evans Schultes's extensive body of ethnographic work undertaken in the valley (1988; Schultes & Hofmann, 1992; Schultes & Raffauf, 1990, 1992) documents religious and symbolic syncretism in the domain of shamanism, which makes use of numerous native plants, most notably *Banisteriopsis caapi*, the potent hallucinogen locally known as yagé and employed as a medicine in shamanic ceremonies. These ceremonies evince the intersection of Indigenous and Catholic religious and ritual elements, juxtaposing the shaman's jaguar tooth necklaces with the with crosses and images of the Virgin Mary that hang on his wall. Schultes's student Melvin L. Bristol (1964, 1965, 1966, 1969) produced work in a similar vein, providing further documentation of syncretic cultural phenomena associated with Indigenous plant use, also particularly in the shamanic domain. Seijas's ethnomedical study of the Kamëntšá (1969) includes ethnobotanical observations as they relate to shamanism and the etiological categories of Indigenous medicine, which evince both Andean-Amazonian origins and a syncretic Catholic overlay.

Finally, there exists an important body of

[16] The word "chumbe" refers to a class of textile common among many Andean Indigenous groups in Colombia. In Kamëntšá, chumbes are known as *tsömbiach* and incorporate a similar repertoire of symbols as Inga chumbes, although I have found during my ethnographic work with Kamëntšá weavers that the interpretation of the same symbols can vary not only between communities, but also between different members of the same community. Given this interpretive flexibility, there is no one correct way to read any given chumbe or sequence of pictographs. Nevertheless, all agree that this type of "reading" is key to the cultural importance of these textiles. Both "chumbe" and "tsömbiach" can also refer metonymically to pictographic sequences in general, as they might appear elsewhere than on the typical woven belts. For instance, a linear sequence of tsömbiach symbology painted around the perimeter of a *maloca*, a ceremonial roundhouse, may also be called a tsömbiach.

[17] This textual approach to the interpretation of the tsömbiach was been emphatically reiterated by the Kamëntšá artisans, mostly weavers, with whom I collaborated during my fieldwork in the Sibundoy Valley. Tsömbiachs are referred to as texts that can be read in various ways, but all agree that the symbols involved speak to and narrativize culturally important objects, events, and processes in the everyday lives of the Indigenous communities of the valley. See Rocha Vivas, 2021, for deeper theoretical treatment of this subject.

Indigenous scholarship on the Sibundoy Valley. In 1989, the Kamëntšá cabildo, or Indigenous government council, produced a survey of demographic, sociocultural, economic, and political transformations of recent decades, diagnosing the causes of problems confronting the community and suggesting alternative practices based on notions of Indigenous autonomy (Comunidad Camëntšá, 1989); this text elucidates Indigenous perspectives on cultural transformations in the valley in the late twentieth century. Chindoy (2020) seeks to produce a decolonial philosophy of his native Kamëntšá culture, providing an Indigenous critique of some of the same scholars I have cited here. Jacanamijoy (2014) writes on the Inga chumbe as a storytelling device, while Juajibioy (1987, 1989) compiles and comments on the oral literature of the valley. This tradition of Indigenous scholarship—in some cases, of autoethnography, which Pratt (1991) suggests is itself a form of discourse related to transculturation (p. 36)—from the valley suggests the viability of the rearticulation of the authors' cultures in academic spaces, as well as Indigenous authors' awareness of and active involvement in transcultural processes within their communities.

While much scholarship, both Indigenous and otherwise, has been produced on the history and ethnography of the Sibundoy Valley, careful review of the literature reveals a tendency among scholars addressing cultural themes to overstate the degree of deculturation experienced by—and to understate or underestimate the creative and adaptive strategies employed by—the Indigenous communities of the valley. This study emphasizes the creative and adaptive aspects of the transcultural experience, in which the indígenas of the Sibundoy Valley—confronted with the transculturating pressures of the Capuchin mission, Catholicism, the Colombian state, and colono settlers—selectively adapted, and, in other cases, resisted, foreign cultural elements as a strategy of defending and rearticulating their Indigenous identities.

2.2. THEORETICAL FRAMEWORK

In interpreting processes of transculturation in Sibundoy Valley ethnohistory, I draw on several scholars and theoretical traditions. First, however, a brief discussion of the term *transculturation* itself is necessary. The term was first introduced by the Cuban anthropologist Fernando Ortiz in his 1940 book *Contrapunteo cubano del tabaco y el azúcar*[18] "as an act of resistance… to the then emergent hegemony of US ethnography and its deployment of the term acculturation, which Ortiz felt to be inadequate on technical grounds" (Millington, 2007, p. 260). As commonly employed, the term acculturation implies the total replacement of one culture by another—for example, the assimilation of Indigenous groups to a colonially imposed culture in a move entailing the loss of the former's language and cultural identity. Ortiz, however, "[u]nhappy with the unidirectional connotations of the term acculturation… proposed a schema of three contrapuntal processes: *acculturation* or cultural acquisition; *deculturation*, or partial cultural destruction, uprooting, and loss; and *neoculturation* or the emergence of 'new cultural phenomena'" (Allatson, 2007, p. 229). Ortiz had his native Cuba in mind when coining the term, as the unidirectionality of cultural change implied by acculturation could not account for the heterogeneity of Cuban identity and history—products of cultural fusion between European, African, Indigenous, and Asian elements. The applicability of Ortiz's theory to other situations of colonial contact and cultural transformation, however, would later cause it to circulate among scholars interested in describing such processes as they occurred in other contexts.

[18] Republished in Harriet de Onís's 1947 translation by Duke University Press in 1995 as *Cuban Counterpoint: Tobacco and Sugar*, with original introduction by Bronislaw Malinowski.

Although the prominent anthropologist Bronislaw Malinowski signaled his approval of Ortiz's new term in the introduction he wrote for the first edition of *Contrapunteo cubano*, it failed to acquire currency in anthropological discourse until its reevaluation decades later. In the meantime, however, the term was adapted by Latin American literary critics, for whom it came to describe the articulation of Latin American identity and history through literature (p. 230). Their basic use of the term, however, reflects its anthropological origins. Spitta (1995) provides a robust definition of transculturation, writing:

> On one side is acculturation, the sheer and irredeemable loss of one's culture, language, history, tradition—even the body and its rhythms; on the other side is transculturation, the overcoming of loss by giving new shape to one's life and culture after the catastrophes of Conquest, colonization, and modernization. Transculturation can thus be understood as the complex process of adjustment and re-creation—cultural, literary, linguistic, and personal—that allows for new, vital, and viable configurations to arise out of the clash of cultures and the violence of colonial and neocolonial appropriations. (pp. 1-2)

Pratt (1991), reconciling the definitions of transculturation articulated by both anthropologists and literary critics, contributed a new term that has since produced a minor literature of its own: the contact zone. Pratt employs this term

> to refer to social spaces where cultures meet, clash, and grapple with each other, often in contexts of highly asymmetrical relations of power, such as colonialism, slavery, or their aftermaths as they are lived out in many parts of the world today. (p. 34)

She goes on to effect a synthesis of both terms:

> Ethnographers have used the term *transculturation* to describe processes whereby members of subordinated or marginal groups select and invent from materials transmitted by a dominant or metropolitan culture. … While subordinate peoples do not usually control what emanates from the dominant culture, they do determine to varying extents what gets absorbed into their own and what it gets used for. Transculturation, like autoethnography, is a phenomenon of the contact zone. (p. 36)

What both Spitta and Pratt's glosses on the term emphasize is the creative character of transculturation—what Ortiz himself termed neoculturation, the third term in his three-stage theory of transculturation—as a mode by which subordinated groups adapt, accommodate, and instrumentalize the impositions of a dominant culture in order to rearticulate and reproduce their own culture under new conditions. It is with this creative and adaptive element in mind that the term is employed here, in the case of the Sibundoy Valley.

Other theorists relevant to an interpretation of cultural transformation, especially in situations of colonialism in the Latin America, include those of decolonial studies and the philosophy of liberation. Foucault (1982), from which these authors take cues, discusses power relations and the creation of subjects in general terms, while Quijano (2000) introduces the notion of "the coloniality of power" to describe the evolution and operation of colonialism in the Latin American context. Dussel (1995) elaborates similar themes in his critique of the Eurocentric logics of Enlightenment colonialism in the Americas, while his concept of "concealment" (*encubrimiento*) informs the work of Sandoval Zapata and Lasso Otaya (2014) on Indigenous resistance in the

Sibundoy Valley. Varese's (1996) work also bears similarities to Dussel's; his claim that "[t]he Indian was, of course, invented by European colonialism" (p. 58) recalls both Dussel's claim that America itself was invented by European colonialism, and Said's (1993) more general thesis that Europeans came to define themselves and Western culture in opposition to the "Other" cultures they encountered and colonized. These theorists' reflections on the nature of colonialism underpin my interpretation of the colonial logics at work in the Sibundoy Valley, which partly determined the conditions under which transculturation occurred there.

Much of the theoretical literature concerning transculturation also discusses cultural resistance, being that transculturation is sometimes conceptualized as a form of resistance. Scott (1985) develops the notion of "weapons of the weak," forms of everyday resistance which he characterizes as "the ordinary weapons of relatively powerless groups: foot dragging, dissimulation, false compliance, pilfering, feigned ignorance, slander, arson, sabotage, and so forth" (p. 29), resistant strategies which in some cases can be located within the Sibundoy Valley. Said (1993) also discusses cultural resistance, particularly in the realms of literature and discourse—what he terms "writing back."[19] Both analyses relate to the forms of resistance described by Millington (2007) and Pratt (1991) in their studies of transculturation and contact zones, respectively. While this study makes no attempt to intervene in the discussion around the direct relationship between transculturation and resistance, the phenomena and strategies of resistance explored by these scholars are nevertheless applicable to an interpretation of cultural transformation in the Sibundoy Valley.

The theoretical literature I have synthesized here allows for a reading of transculturation in Sibundoy Valley ethnohistory as a form of creative adaptation, accommodation, and coexistence. The Indigenous peoples of the valley, marginalized and subordinated within the colonial system, could not maintain their cultures completely unaltered under the transformative pressures exerted by colonialism. What was within their power, however, was to selectively incorporate elements of the foreign, colonially imposed culture—that of Catholicism, the Spanish language, and Colombian national identity—alongside, but not over, those of their own Indigenous cultures. In this respect, the Sibundoy Valley is an excellent case study for transculturation within concrete historical and cultural circumstances—the type of locally grounded conditions to which Ortiz's notion is best applied (Millington, 2007, p. 268). It is to that discussion that I now turn.

3.ANALYSIS

3.1. DEEP TRANSCULTURATION: BEFORE THE ENCOUNTER

Before broaching a discussion of Indigenous transculturation in its most significant phase, the Capuchin mission of the twentieth century, it is important to understand the deep historical undercurrents at work in the valley and its broader geographical context. The Capuchins and their predecessors, a long line of aspirant missionaries and fanatical conquistadors, stepped into a dynamic world in which there already existed a long history of intercultural contact and exchange. In order to understand how the Indigenous communities of the valley were able to maintain core elements of their cultures and identities intact under the deculturating influence of the Capuchins and other colonial agents, we must briefly sketch the history of what I will call *deep* transculturation, understood as the historical

[19] The Kamëntšá poet Hugo Jamioy Juagibioy is a good example of an Indigenous writer who, in "writing back," contributes to what Said would identify as a literature of cultural resistance.

undercurrent of transculturality that, leaving its mark on the Indigenous peoples of the valley, came to define Indigenous cultural survival strategies through the colonial period and to the present.

The Putumayo has been a frontier zone, crossroads, and site of cultural confluence and exchange for millennia due to its strategic location between the Andes and the Amazon, two traditionally distinct spheres of South American Indigenous culture (Gómez, 2006). The Sibundoy Valley, given its central position in this Andes-Amazon interface, is particularly well-positioned along the ancient routes of trade and exchange that have long crosscut the region. As Ramírez (1996) has documented, the history of intercultural contact in the Sibundoy Valley and the broader Andean-Amazonian piedmont extends back into time far beyond the event horizon of conquest and colonialism. This is indicated, in the first place, by the probable lowland origins of the Inga, who still resemble in language and culture their lowland cousins in the departments of Putumayo, Caquetá, and Nariño, as well as in neighboring Ecuador and Peru.[20] The Inga, significantly, have long maintained a tradition of traveling as traders, today ranging across Colombia and as far afield as Venezuela and Ecuador (Gómez, 2006; Ramírez, 1996; Ramírez & Castaño, 1992; Taussig, 1987). This ancient practice brought the Inga into contact with myriad groups quite different in terms of culture and lifeways. Ramírez and Castaño (1992) suggest that this early, pre-conquest experience with intercultural contact inscribed itself in the structures of Sibundoy Valley Indigenous culture and thought, positing that

> [The] Sibundoy strategy for cultural survival consists of integrating foreign elements without denying their own beliefs by establishing mediations that match native thought structure, which is based on a movement of complementary opposites. (p. 287)

The result of this process of mediation is that both traditions are accommodated within a single cultural domain—one that is now, through this movement, made transcultural. This is the basic mechanism by which deep transculturation took place in the Sibundoy Valley in prehispanic times. Proof of that is in the many vestiges of transcultural experiences that predate the colonial period in numerous cultural domains—namely shamanism, mythology, and ethnobotany. Ramírez and Castaño describe this "strategy for cultural survival" as it operates within the shamanic sphere:

> As traders since precolumbian times, Sibundoy shamans have incorporated different cultural codes and elements from other groups into their own shamanic structure. … This dynamic allows them to resist potentially disruptive influences. (p. 287)

The syncretic nature of Sibundoy Valley folk religion and shamanism is well-evidenced in the ethnographic record. McDowell (1989, 1992, 1994) has noted the convergence of both Andean and Amazonian strata and symbolism within the domains of religion and folklore, both of which are central to the shamanic tradition in the valley. McDowell (1989) characterizes Sibundoy Valley folk religion as "a nexus of popular religiosity defined by three major strands: a pan-Andean cosmological bedrock, a tropical forest ecstatic

[20] Highland Inga is the variant of Inga Kichwa spoken in the Sibundoy Valley. It is mutually intelligible with Jungle Inga, as spoken in the neighboring Amazonian lowlands, where most ethnohistorians posit the Inga of the valley migrated from. Inga forms part of a broader dialect continuum extending throughout the Northwest Amazon and Andean piedmont, suggesting a long history of migration and diffusion across an extensive geographical area (Gómez, 2006). McDowell (1989) writes that "[The] Inganos of the Lower Putumayo are known by the Kamsá and Ingano alike as amigos, and they are perceived as a friendly extension of the native communities of the Putumayo highlands" (p. 9).

shamanism, and an overlay of folk and doctrinal Catholicism imposed by the missionaries" (p. 174). Prior to Christianization, the first two strata delineated the character of religious life in the Sibundoy Valley. Typical Andean cosmological elements include the culture hero Wangestmuna, a figure analogous to the central Andean Viracocha (McDowell, 1992, p. 100), as well as anthropomorphic solar and lunar deities (1989, p. 182) and *huaca* earth shrines, sites of spiritual power (p. 183). Amazonian elements, on the other hand, include the "ecstatic" shamanic tradition itself, replete with practices and beliefs typical of Upper Amazonian spirituality, namely many of those which distinguish Amazonian shamanism from its Andean counterpart, such as the prevalence of sorcery and animal transformation motifs (p. 185). McDowell concludes that "[t]he presence of tropical forest elements in the Sibundoy folk religion is a product of the intimate association of the Sibundoy native with the lowland margins of the Andes" (p. 186). McDowell's analysis makes clear the historical depth of transculturation within the Sibundoy Valley as a process of incorporation and mediation between distinct Andean and Amazonian cultural elements. This process would continue into the colonial period, serving to accommodate elements of colonial culture much as it had foreign cultures of Indigenous origin, further allowing Sibundoy Valley indígenas "to resist potentially disruptive influences."

The Sibundoy Valley has long been a vital crossroads in the ancestral trading routes that crosscut the whole piedmont and beyond, extending far into the jungle to one side and beyond the western slopes of the Andes to the other. The ethnobotanical record, like the syncretism evident in the shamanic domain, also indicates the historical depth of Indigenous intercultural contact and borrowing between Andes and Amazon. The most significant example is the hallucinogenic vine *yage*,[21] whose widespread ceremonial and medicinal use by both Inga and Kamëntšá shamans evinces a lowland origin. Indeed, the vine is still today mostly imported from the adjoining lowlands of the Middle and Lower Putumayo, as it does not grow well at the elevation of the Sibundoy Valley (Bristol, 1965, 1966; Jacanamijoy, 2014; Schultes, 1988; Schultes & Hofmann, 1992; Schultes & Raffauf, 1990, 1992; Seijas, 1969).[22] The importance of yagé itself as both a product and cause of intercultural mediation between Andes and Amazon should not be understated. In its capacity as a "civilizing agent," a quality ascribed to it in the mythic corpus of the Sibundoy Valley (Ramírez & Castaño, 1992, pp. 295-96), yagé facilitated peaceable contact and exchange between the diverse groups involved in its trade. The lowland indígenas from whom Sibundoy Valley shamans procured the brew had the reputation of being both dangerous "savages" and powerful sorcerers (McDowell, 1989, p. 118; Taussig, 1987, p. 153).[23] However, in the context of the intercultural yagé ceremonies to which groups from across the piedmont were invited to partake, all were momentarily equals, their temporary union—physical and spiritual—mediated by the intoxicating brew.

[21] *Banisteriopsis caapi*, more widely known as *ayahuasca* (Quechua: "vine of the soul"), or *ambi waska* in Inga (McDowell, personal communication, April 11, 2022) and *biaxíi* in Kamëntšá (Bristol, 1966, p. 120), although both groups also employ the generic "yagé." The use of yagé in Indigenous curing, diagnostic, and divination ceremonies is widely documented among the Indigenous groups of the Colombian Amazon, but the *taitas*—shamans and medicine men—of the Sibundoy Valley, where the vine is not cultivated, are unique for importing it from the jungle lowlands. For a detailed description of the ethnobotany of yagé in the Sibundoy Valley, see Bristol (1966). Seijas (1969) discusses yagé in its ethnomedical context.

[22] Despite non-optimal growing conditions, some in the valley do cultivate yagé (Bristol, 1966).

[23] A term that frequently appears in the literature on intercultural contact across the piedmont is *auca* (Quechua: "savage"). Its use by the Indigenous people of the Sibundoy Valley, as well as depictions in their mythic corpus of lowland peoples as culturally backward and uncouth, reflects a prejudice towards lowlanders once common among highland peoples across the Andes.

Historical ethnobotanical studies also indicate that the Indigenous peoples of the valley were both mediators of and participants in the prehispanic and early colonial *curare*[24] trade, engaging with groups as diverse as the Tikuna of the deepest Colombian Amazon and the Quillasingas of neighboring Pasto (Cipolleti, 1988, p. 534). The Amazonian plant *Ilex guayusa*, imported from the lowlands south of Mocoa, has also been reported in the ethnobotany of the Inga, indicating another possible historical trade complex (Dueñas et al., 2016, p. 89). On the other hand, the use of native plants (i.e., endemic to the Sibundoy Valley) in the ethnobotany of the valley is extensive, and some cultivars are known to exist there and nowhere else, including several varieties of the hallucinogenic genus *Datura*, indicating a history of intensive cultivation (Bristol, 1969, pp. 166, 170).[25] Indeed, as Bristol notes, "[m]ore variation in *Datura candida* is found in the Valley of Sibundoy than is known at any other locality" (p. 181). There are indications that at least one variety of *Datura* was acquired through contact with other groups, namely the cultivar *Andaquí borrachera*, whose name suggests contact with the Andaquí people to the northeast, at the head of the Magdalena Valley (p. 223). Additionally, it appears that just as groups from across the piedmont would frequently gather to consume yagé together, so would such delegations make visits to the Sibundoy Valley to partake in the *Datura* ceremonies of the Inga and Kamëntšá:

> If the lowland doctors are skilled in the preparation of yagé, the Sibundoy native doctors are respected for their expertise in the handling of borrachera. Not only Ingano amigos, but also members of the far-flung Siona, Huitoto, Kofan and Kwakier indigenous groups come to the Sibundoy Valley in search of this powerful remedy, participating in what one informant called "an exchange of medicines." (McDowell, 1989, p. 137)

McDowell is here referring to a contemporary practice, but it is reasonable to suppose that these gatherings probably predate colonization, a supposition supported by the apparent antiquity of *Datura* cultivation in the Sibundoy Valley. If this supposition is correct, these gatherings would mark another instance of intercultural exchange in the ethnobotany of the valley. In any case, the ethnobotanical literature abundantly demonstrates that although the ecology of the valley is Andean, some of the plants most important to and widely used in both popular medicine and shamanic tradition were (and still are) sourced from the lowlands and from other Indigenous groups—not to mention that the shamanic tradition itself is of the same origin. Clearly, the ethnobotanical domain evinces the same history of intercultural contact as is on display in the domains of religion, folklore, and shamanism.

Here I have summarized the history of deep transculturation in the Sibundoy Valley in order to argue that the transcultural experience was not brought to the valley with the advent of Europeans and their cultural impositions, but rather that it

[24] Curare is the common name for various plant-based alkaloid arrow poisons used for hunting and occasionally warfare across much of the Amazon basin. Cipolleti (1988) points out that the preparation of curare depends on cultural factors (i.e., knowledge of its preparation and use), not the local presence of poisonous plants (p. 528), possibly supporting the notion of Sibundoy Valley indígenas as intermediaries in the trade of a valuable commodity whose preparation by the lowland groups who produced it was kept a trade secret.

[25] After yagé, *Datura* (locally known in Spanish as *borrachera*, meaning simply "inebriant") is perhaps the most important psychotropic in the ethnobotany of the valley. There seems to be some ambiguity concerning its use, however; Bristol (1969) writes that "Yepes, Schultes and Theilkuhl use the words divination, prophecy, diagnosis and witchcraft in describing the psychotropic use of *Datura*, yet no Sibundoy I encountered stated such reasons for using any *Datura* drug. Nor has Haydée Seijas found these usages during more than one year of investigating Sibundoy ethnomedicine" (p. 191). According to Bristol, uses include: as a treatment for rheumatism, a pesticide, a hunting aid for dogs, a vermifuge, a topical suppurant, an emetic, a carminative, and against colds and erysipelas (pp. 187-89). These are in addition to *Datura*'s powerful hallucinogenic properties.

long predates their arrival to the Americas. This point bears emphasizing, as it explains in part how the indígenas were able to mitigate the deculturating effects of the colonial encounter and mediate the incorporation of colonially imposed cultural elements into their own schemata according to a deeply ingrained strategy[26] that served the same purpose in prehispanic times. What was unique about transculturation as it occurred in the wake of the colonial encounter was the degree of deculturation wrought on the Indigenous communities of the valley by the logics of colonialism. Transculturation in the colonial period proved far more coercive and more hostile to Indigenous cultures than any known by Sibundoy Valley indígenas before. The adaptive strategy inscribed by long historical experience in the cultural fabric of the Sibundoy Valley, which had proved so successful in mediating encounters between Indigenous cultures, was now to be put to the test in a confrontation of a profoundly different nature.

3.2. THE COLONIAL ENCOUNTER

The first Europeans to step foot in the Sibundoy Valley belonged to the conquistador company of Juan de Ampudia and Pedro de Añasco, lieutenants of Sebastián de Belalcázar, one of the key figures in the conquest of Ecuador and Colombia (Bonilla, 1968, p. 14). First contact occurred in June of 1535 under violent circumstances. Bonilla provides a description of the ethnogeographic context in which this first encounter took place:

> [At the time of the conquest,] the country of the Sibundoys[27] went beyond the bounds of the valley itself. Its tribes occupied, to the north, the small valleys of Juanambú and Quiña; to the south, the region of La Ensillada; and part of the western *altiplano*, shared with the Abades, Quillacingas, and Pastos tribes. (p. 14)

It was in the *altiplano* that the Spanish scouts under De Ampudia and De Añasco entered the region and began conquering. The conquistadors continued east until De Ampudia encountered the Valley of Sibundoy, where he fought the locals for three weeks before retreating (p. 15). Bonilla provides an idea as to the traumatic mark left by this violent first contact on the inhabitants of the valley:

> Among the Sibundoys, this first encounter with civilization left only one memory: that "upon seeing their valley invaded by the Whites, many ascended to the heavens upon the smoke rising from a bonfire; the stars were the glint of their eyes." (p. 15)

The Sibundoy Valley escaped further contact until, seven years later, the bedraggled company of Hernán Pérez de Quesada, returning from a futile search for El Dorado, entered the valley from the eastern lowlands. Referring to the expedition, Taussig (1987) writes:

> The jungle-dwelling Indians around the Mocoa river (described by contemporaries as cannibals who ferociously fought off the Spanish) assured Hernán Pérez de Quesada and his 260 companions of conquest that the Golden Land lay close by in the mountains rising to the west in a fabled land called Achibichi, where the

[26] "Strategy" might imply a degree of personal intentionality which I do not mean to impute on the individuals involved in this history. What I mean to stress is the slow unfolding of this adaptive strategy on the macro scale, that is, on the level of culture and society, and of the historical currents that shape cultural transformations in ways undirected by the agency of individual actors. It is on this level that the "strategy for cultural survival" articulated by Ramírez and Castaño (1992) operates.

[27] Bonilla uses the term "Sibundoy" as an antiquated ethnonym for the Kamëntšá, apparently based on his belief that the Inga only emerged as a separate group during the colonial period due to the partial Quechuaization of the Kamëntšá by missionaries who employed Quechua as a *lingua franca* and language of indoctrination among Indigenous groups (p. 36). This supposition is not upheld by other ethnohistorians of the valley; the presence of Inga-speaking groups in the Sibundoy Valley long predates the colonial encounter.

> Spaniards found the tillers of the Sibundoy Valley but no gold, and beyond that the new Spanish town of Pasto. (p. 142)

In both of these first encounters, the conquistadors noted that the valley appeared populous and prosperous and was already home to sizable settlements bearing names such as Putumayo, Manoy, and Sebundoy (Bonilla, 1968 p. 16). It was not long after these early encounters, consequently, that the first missionaries appeared in the valley, with Christianization beginning in 1547 under a company of Franciscans. Despite the apparent success of Christianization efforts during the Franciscans' residence in the valley, their missions were transferred to the Dominicans in 1577 by royal provision of the Real Audiencia de Quito. The Dominicans, for their part, retired from the valley after only six years, taking with them on their departure a wooden figure of the Cristo de Sibundoy, which soon passed from memory into myth among the partially Christianized indígenas.[28] It is in the legend of Nuestro Señor de Sibundoy ("Our Lord of Sibundoy") that developed following the departure of the Dominicans that we may identify the first sign of transculturation of a syncretic Catholic nature in the Sibundoy Valley. This legend warrants analysis as an archetypal and defining example of transculturation in the post-contact period.

Friede (1945) and Juajibioy (1989) provide several versions of the legend that differ little from one another in general outline, although more syncretic elements are present in Juajibioy's version. In both versions, an effigy of Christ appears to the inhabitants of the Sibundoy Valley dressed in Indigenous garments, which Juajibioy describes in vivid terms:

> He was wearing a wool *cusma* [Indigenous tunic], dyed blue, tied at the waist with an elegant string girdle, and over it a native *ruana* [poncho] with a black background, blue and white stripes, red, blue, and white borders, but no necklaces. That young man of extraordinary beauty was the Lord of Sibundoy. (p. 26)

The Christ effigy orders that the indígenas build a chapel in the place of his apparition, saying "I want to live here among you so that you give up your bad customs" (Friede, 1945, p. 316). The people comply, building him a chapel in the place where there now stands a church in the town of Sibundoy and placing the Christ effigy at the altar. In Juajibioy's (1989) version,

> The temple destined for the celebration of the religious cult of the community was a wooden construction with a roof made of palm leaves from the region. Its structure was bound with special vines, cut under a good moon so that they would last long. (p. 18)

Soon, however, people notice that every morning the Christ effigy appears exhausted and with wet clothes.

> When the governor of the cabildo was informed of the nighttime escapes of the effigy that suggested moral sin, he ordered that the effigy be punished with twelve lashes. But Christ, before asking for pardon and promising reform, as the Indians generally do when punished, left for Pasto and never again returned to Sibundoy. (Friede, 1945, p. 316)

Only later do the indígenas discover that the Christ effigy had been going out at night to work on the road between Pasto and Mocoa "in order to ensure that the mountain road opened by the conquistadors Juan de Ampudia and Pedro de Añasco, discoverers of Sibundoy in July of 1535, would not disappear" (Juajibioy, 1989, p. 19).

[28] The effigy was brought to the Santo Domingo church in Pasto, where it is still venerated by Sibundoy Valley *indígenas* who make pilgrimage to see it (Friede, 1945, p. 316).

Discovering that he was laboring to help them all along, the indígenas come to regret their treatment of the Christ effigy.

In tracing the history of colonial transculturation in the valley, this legend stands out on multiple levels. First, it is the earliest instance of Catholic syncretism to appear in the post-contact history of the valley. Given that its central character is the Christ effigy brought to the valley by the Franciscan Order in 1547 and removed by the Dominicans in 1583, the legend must have its historical roots at an early date in the chronology of the contact period (Juajibioy, 1989, p. 18). Second, the details of its syncretic symbolism indicate only partial Christianization at this early stage of colonization. Catholicism is already the central element, an indication of the rapid success of early Christianization, but it is significant that Christ appears in the guise not of a conquistador or priest but wearing the black cusma with blue and white stripes and red fringe that is the traditional men's garment in the Sibundoy Valley (Bonilla, 1968, p. 256; Schultes, 1988, p. 24). Additionally, the chapel built for the Christ effigy is of an architecturally syncretic structure, with a Christian function but built from local materials to an Indigenous design. The palm leaves, although of a local species, evince Christian symbolism, an element also evident in the curing rituals of the shamanic domain[29] (Bristol, 1966; Seijas, 1969) and in the carnival of Bëtsknaté (Castaño, 2021). Their appearance in the legend likens the advent of Christ in Sibundoy to the biblical Christ's triumphal entry into Jerusalem, an event celebrated by Christians on Palm Sunday.

The reference to the "special vines" used to bind the wooden walls and palm leaf roof is suggestive of a lowland Amazonian influence, as vines and lianas are characteristic of the lowland forests but grow less abundantly in the Andean highlands. Additionally, this line may implicitly reference yagé, which for the people of Sibundoy is a special vine indeed, and which also, as discussed above, has long served a unifying—one could say binding—function among the peoples of the piedmont, one which it might also serve in mediating encounters between indígenas and colonizers.[30] Given the importance of yagé to Indigenous religion in the valley both before and after contact, it would also not be unreasonable to identify a religious significance in the appearance of yagé in a syncretic Catholic context. That the "special vines" are cut under a "good moon" is a detail suggestive of an Andean substrate in addition to an Amazonian one, recalling McDowell's (1989) identification of the significance of moon symbolism in the domains of religion, mythology, and folklore, in which "[t]he phases of the moon mark periods of time that are thought to be auspicious or otherwise for a number of human endeavors" (p. 77).[31] Another instance of symbolic syncretism is the detail recorded in Friede's (1945) version of the legend,

[29] My own participation in several yagé ceremonies attests to their deeply syncretic nature. The medicine itself is widespread across the western Amazonian basin, a central element in numerous Indigenous religious and medical traditions, but all the shamans with whom I partook of it were Catholic and made frequent allusions to Christian figures and notions, while their ceremonial spaces were adorned with both Indigenous and Christian articles. Behavior such as shamans' efforts to spiritually cleanse their patients by "sucking" malevolent spirits from their body or dislodging "spirit darts" embedded by the sorcery of rival shamans evinces Indigenous origins, while the prayers and supplications muttered by shamans under their breath as they work are clearly Christian.

[30] Although the missionary fathers, particularly the Capuchins, attempted to suppress the use of yagé, "as they considered it one of the most deeply rooted superstitions of the Putumayo natives, which was of no use to their evangelization nor to their productivity" (Sandoval Zapata & Lasso Otaya, 2014, p. 52), they were unsuccessful in their efforts, and some missionaries, including the apostolic prefect Bartolomé de Igualada, were known to partake in yagé ceremonies and even to officiate at such ceremonies themselves (Ramírez & Castaño, 1992; Sandoval Zapata & Lasso Otaya, 2014; Taussig, 1987). This is an example of the bidirectionality of transculturation, whereby colonizers were influenced by the cultures they colonized (Millington, 2007; Pratt, 1991; Spitta, 1995).

[31] This belief still exists among the Kamëntšá today. One mask carver whom I interviewed, for instance, told me that the best wood for carving is gathered under the light of a full moon, while others informed me that yagé is thought to be especially powerful and auspicious if imbibed on such a night.

which suggests that Christ first appeared in the form of a bird before, pursued by a hunter, he transformed himself into an effigy (p. 316); this element draws on motifs of animal transformation and anthropomorphic characters abundant in the mythological and folkloric corpus of the valley (Juajibioy, 1987, 1989; McDowell, 1989, 1992, 1994).

On a symbolic level, the legend of "Our Lord of Sibundoy" is replete with syncretic elements and layered semantic referents of diverse origins. Yet despite the incongruities—Christ in a cusma?—the contradictions are only apparent; there is no tension, and the legend is presented and received quite naturally in the traditional performance settings in which it circulates. The apparent ease with which Catholic elements were, at an early date, incorporated into the preexisting religious and symbolic systems of the valley evinces the operation described by Ramírez and Castaño (1992) as a "strategy for cultural survival" which "[establishes] mediations that match native thought structure... based on a movement of complementary opposites" (p. 287). Semantic congruence is established between the complementary opposites in question—Christ in a cusma, Indigenous and Christian architectural elements, Amazonian and Andean symbolic and religious substrates—and each finds its place within a system that accommodates all, though without necessarily privileging all to the same degree.

There is something else interesting about the legend of "Our Lord of Sibundoy," and that is the allusion to the road that the Christ effigy goes out to work on at night. Juajibioy's version identifies the road as the one opened by Juan de Ampudia and Pedro de Añasco in 1535, while Friede identifies it as the road between Pasto and Mocoa constructed under the Capuchins in the twentieth century (1945, p. 318). In any case, the implication is clear: the advent of Christianity in the valley meant that the path of conquest could never be closed.

The identification of Christ with the roads opened by colonizers—the same roads that brought violent conquest, missionaries, tax collectors, and settlers to the valley, whether in the sixteenth century or the twentieth—suggests an awareness on the part of the indígenas that the colonial encounter marked a change that could not be reversed. We cannot, therefore, fail to miss a fact evident in the type of transculturation exemplified by "Our Lord of Sibundoy" that is not apparent in the prehispanic processes of transculturation examined above: that the distinguishing factor between prehispanic and post-contact forms of transculturation in the valley is the degree of deculturation that each implied. There is little evidence to suggest that significant deculturation occurred in instances of transcultural contact in the valley in the prehispanic period, although it is improbable that positive evidence for it could be identified, given the difficulties of reconstructing cultural processes in the deep past without the aid of written records.[32] On the other hand, the advent—one could say invention, following Dussel (1995) and Quijano (2000)—of colonialism in the Americas marked a vast difference in terms of how transculturation occurred and how it affected Indigenous cultural integrity.

Reduced to the monolithic and invented category of "Indian" within the rigid hierarchy of a colonial system that positioned Indigenous people as racially, culturally, and religiously—all eventually amounting to *ontologically*—inferior to Europeans, who, by contrast, positioned

[32] One would expect, at the very least, that if some major deculturating process had occurred in the deep past, it would be recorded in the oral literature or mythic corpus of the valley; this does not appear to be the case. In any case, even in situations of imperial subjugation by conquest in the prehispanic period—for example, under the Inka or Mexica empires—the aim of the conquerors was typically the extraction of tribute and the maintenance of social order, not the wholesale acculturation of imperial subjects. There is no prehispanic analogue to colonialism.

themselves as representatives of "civilization" and virtue, the former saw their cultures and lifeways come under sustained attack and repression by the latter (Dussel, 1995; Quijano, 2000; Varese, 1996). In the Sibundoy Valley, the devalorization of Indigenous cultures which accompanied the colonial encounter, even in the absence of a sustained foreign presence in the valley itself, was first expressed by the subordination of Indigenous religious and symbolic categories to those of Catholicism. This is what is most salient about "Our Lord of Sibundoy": that after only a few decades of Christianization, colonially imposed categories came to subsume Indigenous ones. The main subject of the legend is Christ, and its moral is that Christianity—meaning, in cultural terms, colonialism—was there to stay.

The alterations manifest in the different versions of "Our Lord of Sibundoy" through different periods of the colonization of the valley suggest the variable political role the legend played in explaining or legitimizing the imposition of colonial conceptual categories over Indigenous ones. Bonilla (1968) cites a variant of the legend of "Our Lord of Sibundoy" that he describes as a "Christian reevaluation." It was recorded in the Capuchin period, sometime after 1930—the end of most transformative phase of the mission:

> Before punishing the Lord… the natives of the town of Sibundoy spoke the same language as those of Santiago and San Andrés, which is Quechua; but, as punishment for the sacrilege they committed against his divine personage, he took from them the language of rational men and gave them that of pigs…[33] (p. 185)

If we take the earlier versions of the legend as exemplary of a historically standardized original with probable roots in the sixteenth century, this version appears to be a twentieth-century corruption resulting from several decades of Capuchin indoctrination and "Christian reevaluation" of Indigenous cultural elements in line with Capuchin ideology and goals. The distinction suggested here between "rational" and "animal" speech (and by implication, habits), reified by the Indigenous informant who shared this variant of the legend, exemplifies the internalization—both individually and on the level of culture and society—of colonial hierarchies and the devalorization of Indigeneity; to speak an Indigenous language is to speak like an animal, unlike the human speech of "rational men" (i.e., Europeans). Also new in this version is a more clearly Christian reverence for the figure of Christ; his beating is referred to as a "sacrilege… committed against his divine personage," while such unambiguous terms are absent from earlier iterations, suggesting greater fluency in the language of Catholicism—especially concerning themes of guilt, sin, and punishment—under the Capuchins than in earlier periods.

Nonetheless, as demonstrated by my analysis of the Indigenous symbolic and religious substrata exemplified in the legend, to acknowledge Indigenous cultural suppression as a distinguishing mark of colonialism is not to suggest that Indigenous cultural systems did not remain viable and resilient in the ways in which they were rearticulated and concealed by a colonial overlay. Focusing on processes of deculturation over the accomplishments of Indigenous adaptation centers the agency of colonizers rather than that of Indigenous people. Referring to Indigenous religious and symbolic substrata, McDowell (1989) returns us to a more positive view of their survival under

[33] "The language of pigs" refers to an antiquated Inga name for the Kamëntšá language, *coche*, the word for the animal itself. According to Bonilla, "the explanation appears to rest in the old [Kamëntšá] custom of raising pigs in the swampy parts of their reservation" (p. 185). According to several Kamëntšá field collaborators, especially those who grew up and went to school during the Capuchin mission, missionaries and colonos adopted this notion as a disparaging means of discouraging the use of the Kamëntšá language.

Christianization:

> In the Sibundoy Valley very little of the precolumbian system survived the ministry of the Spanish priests intact, but it is remarkable how much of it persists to color the Catholicism of the valley and to provide a folk religious counterpart to the official religion of the land. ... In the Sibundoy Valley as elsewhere in the Andes, the conversion of the native peoples to the Catholic faith was perhaps deceptively successful. Conformance to the sacraments and submission to the priests masks a remarkable persistence of aboriginal patterns. (p. 189)

This dynamic, typical of the maintenance of concealed or "masked" Indigenous cultural elements under the explicit and official overlay of colonial culture—not only in religion but in domains as varied as folklore, ethnomedicine, carnival, and others—was first encapsulated in the legend of "Our Lord of Sibundoy," demonstrating the viability of this operation from the time of earliest encounter.

A later exemplar of transculturation in the colonial period is the will of the legendary *cacique* Carlos Tamabioy,[34] whose name is still evoked in the valley today. On March 15, 1700, Tamabioy issued a will bequeathing legal title to all the lands under his rule upon his heirs and the community at large. At the time, his holdings included not only all the land of the Sibundoy Valley but also several settlements to its north, such as Aponte, an Inga community two days' walk across the highlands (Bonilla, 1968, pp. 27-31). The will was written in Spanish and is replete with Catholic references, indicating that Spanish was spoken by at least some Indigenous leaders and that Christianization continued apace, even in the general absence of missionaries in the valley. Tamabioy's will set a precedent for Indigenous land rights in the Sibundoy Valley, although it was soon to be challenged by avaricious settlers in a series of legal disputes that would typify the Indigenous struggle for territorial autonomy in later periods (pp. 33-36). In the 1730s, Sibundoy Valley indígenas suffered their first major land deprivation when a colonial court in Quito settled a land dispute in favor of colonists, depriving the former of a full half of their land to the north of the valley—namely the settlements of Jachinchoy and Abuelapamba (p. 35). Nevertheless, Tamabioy's will succeeded in safeguarding Indigenous land rights in the valley itself throughout much of the colonial period, an accomplishment for which he is still revered today.[35] The use of Spanish, Catholic references, and the adoption of the documentary and legal genres of colonial society evinced in Tamabioy's will are exemplary of the pragmatic and subversive adaptative strategies often employed by Indigenous agents making the most of the limited means available to them within a colonial system that ordinarily worked against them.

The figure of Carlos Tamabioy is important on another level: more than only an historical figure, he is a legendary one. In an account transcribed by Friede (1945), an Indigenous interlocutor explains that

> Carlos Tamabioy came to life one day in the morning, but not in the way that children are born; he was already large and developed. Seven wet nurses died of

[34] Also spelled "Tamoabioy" in some of the literature.

[35] As specified in Tamabioy's will, the land he bequeathed to his community bore his name. In recent years, Indigenous social movements in the Sibundoy Valley have referenced their land as the "Terrtitorio Ancestral Cacique Carlos Tamabioy" in a process which McDowell identifies as "the use of traditional motifs to feed the current political movement" and "[to claim] a kind of ecosovereignty over [Indigenous people's] ancestral domain" (personal communication, December 15, 2021). Tamabioy has become a geographic reference as well as a historical one. A Kamëntšá *vereda*, or rural district, outside the town of Sibundoy bears his name, while the chorus of Kamëntšá band Luar Kawsay's song "Benach" pairs the name with terms identifying the Kamëntšá homeland: "Tabanok, Sibundoy, Tamabioy..." (Luar Kawsay, 2022).

> exhaustion trying to satisfy the uncommon appetite of the newborn, who grew in a prodigious manner. By noon, the child was an adult. In the afternoon he gathered all the Indians of Sibundoy, wrote a list of all their lands for them and their descendants, divided the lots, distributed them with set boundary lines, and died with the setting of the sun that very day. (p. 317)

This mythification[36] of the historical Tamabioy evinces both the continued vitality and employment of Indigenous mythmaking processes by which "[p]ast events are raised to the mythic level and reinterpreted according to the native worldview" (Ramírez & Castaño, 1992, p. 293) and the persistence of an Andean substrate in Indigenous mythology. McDowell (1994) describes Tamabioy "as a solar deity who arrived, provided for his people, and departed all in the course of a single day" (p. 36), recalling the solar symbolism of Andean origin present in other cultural domains in the valley (Friede, 1945, p. 318; McDowell, 1989, 1994). In any case, the historical and the mythical are not incommensurable; it seems natural that such an important figure should have been deified in recognition of the service he rendered to his people.[37]

Here I have analyzed the dynamics of transculturation in the contact period and colonial era with reference to its two most significant textual examples. What these examples demonstrate, in different ways, is the operation by which foreign and colonially imposed cultural elements—religious, symbolic, semantic—were adopted but rearticulated, not simply copied, in a process of accommodation within a preexisting cultural framework. I have also emphasized that, despite the viability of this strategy of mediation between foreign and Indigenous cultural elements, the operation of transculturation in the colonial period differed qualitatively from transcultural processes in the prehispanic period, in which the question of power differentials and forcible imposition between mutually engaged cultures was less pertinent, if not absent. The logics of colonialism, which positioned Indigenous people and cultures as subordinate to European ones, thereby devalorized Indigeneity and forced a degree of deculturation never experienced in the prehispanic period. Nevertheless, Indigenous cultures adapted by concealing Indigenous patterns beneath a superficial colonial overlay. This strategy, itself a rearticulated form of the adaptive strategies employed in the prehispanic period, would again find itself tested by the most transformative period of transculturation in the history of the valley: the Capuchin mission of the twentieth century.

3.3. THE CAPUCHIN MISSION: 1904-1970

The Capuchin mission, established in 1904[38] and dissolved in 1970, marks the most transformative phase of the colonial process in the history of the Sibundoy Valley. The Capuchin period began with the establishment of the Apostolic Prefecture of Caquetá and Putumayo, which by state decree was granted governing powers over an extensive area of southwest Colombia (Bonilla, 1968; Restrepo,

[36] Friede uses the term "sanctification" (p. 318), though there are no obvious Christian elements in the quoted excerpt.

[37] Later, in the Capuchin period and in recent decades, the invocation of Tamabioy's name became central to Sibundoy Valley natives' claims to their ancestral territory, to the extent that settlers have disputed the historical authenticity of the cacique in order to deny the legitimacy and proof of property of the Indigenous people over the reservation lands of Sibundoy and Aponte (Bonilla, 1968, p. 27). And while, as we will see, colonizers were successful for a time in dispossessing the heirs of Tamabioy of their land by means of legal trickery, deceit, and plain theft, Tamabioy's promise was eventually vindicated—albeit 316 years after the fact. In 2016, the Colombian Ministry of the Interior formally returned the lands named in Tamabioy's will to his descendants ("Termina una disputa").

[38] Although the formal date of establishment of the mission was December 20, 1904, by papal decree, the Capuchins had worked informally in the Sibundoy Valley since 1899, and much of the infrastructure of the mission was already in place by its official establishment (Bonilla, 1968).

2006).[39] The stated goal of the mission, as articulated by the apostolic prefect who ruled at the height of its power, the Catalan[40] friar Fidel de Montclar, was to "introduce civilization to the virgin jungles" (p. 74). This aspiration bore as its corollaries the indoctrination of indígenas into Catholicism, the suppression of their cultures, the economic development of the valley, the construction of roads connecting the valley with urban areas such as Pasto and Mocoa, the demographic colonization of the valley by settlers from other parts of Colombia, and other processes that radically altered life in the valley for its Indigenous peoples (Chaves 1945; Escandón, 1913; Gómez, 2005, 2011, 2015; "Informes," 1916; Uribe, 2011, 2019). This section explores Indigenous responses to transculturation in this most transformative period, particularly through a strategy termed "concealment" by Sandoval Zapata and Lasso Otaya (2014). Concealment describes the masking of Indigenous cultural elements under a Catholic and colonial semantic and aesthetic overlay in order to avoid the repression with which the Capuchins often responded to explicit displays of Indigeneity. I suggest that concealment, in addition to the forms of accommodation and selective incorporation of foreign cultural elements already discussed, constitutes a primary adaptive strategy for cultural survival during the Capuchin period. Before analyzing Indigenous transculturation under the Capuchins, however, the basic policy of their rule should be explained.

Besides the moralizing goals of Catholic indoctrination, the "civilizing" mission of the Capuchins also had the purpose of bringing Indigenous groups into the orbit of the Colombian state; the missionaries acted as delegates of a state which empowered them to colonize and settle the frontier in the name of the Colombian nation (Bonilla, 1968; Gómez, 2005; Mongua Calderón, 2020; Restrepo, 2006; Sandoval Zapata & Lasso Otaya, 2014).[41] The alliance between the Capuchins and the state and the role of the former in advancing the interests and the effective frontier of the latter was by no means covert; De Montclar wrote in 1914 that "the missionaries are the principal factors behind the influence and aggrandizement [of the state]" (Bonilla, 1968, pp. 284-85). In essence,

> the coercive systems imposed by the Capuchin mission on the Inga and Kamsá Indians of the Sibundoy Valley, from the beginning of the twentieth century to the late 1960s, [had the goal of] usurping their ancestral lands, controlling and appropriating their labor, effecting their physical and spiritual subjection within the general process of "civilizing the savages," and incorporating the eastern Amazonian territories into the economic, political, and sociocultural ambit of the nascent "national society" of Colombia.

[39] In the early decades of the Apostolic Prefecture's existence, neither the Colombian state nor its missionary agents could claim *de facto* control over or even effective presence in the extensive expanse of the Amazon that Colombia claimed as part of its national territory. The process of consolidating state presence and national borders in the far reaches of the Amazonian frontier would not be "complete" until the mid-twentieth century, particularly after the Colombia-Peru War of 1932–33, which formalized the Colombian-Peruvian border (Recalde, 2006). The missionaries themselves were central agents in the process of state formation in the frontier regions, as Gómez (2011, 2015) has convincingly shown and as the missionaries themselves attest in their writings (Escandón, 1913; "Informes," 1916; Restrepo, 2006). It could be argued, however, that the Colombian state has never effectively exercised political control over much of its Amazonian territory, and still today large parts of the region remain under the control of guerrilla and narcotrafficking groups.

[40] Most of the leadership of the Apostolic Prefecture were Catalans from Spain; Colombians tended to be of lower rank than the Spaniards. The two most prominent friars to govern the Apostolic Prefecture for most of its existence, Fidel de Montclar and Bartolomé de Igualada, were both Catalans (Bonilla, 1968).

[41] The relationship between state and Church was reciprocal. A series of laws in the late nineteenth and early twentieth centuries stipulated that the state had an obligation to protect the Church. In return, the Church was obliged to put a portion of the annual indemnity payments towards "the fomentation of the evangelization of savages" (Bonilla, 1968, p. 58). According to Bonilla, this set a standard that "since then came to form part of the habitual relations between the two powers" (p. 58).

(Gómez, 2005, p. 51)

The consequence of the alliance between the Capuchins and the state was that the missionaries were given free rein to deploy the most repressive policies in the name of "civilizing the savages" and advancing the interests of the Colombian nation.

The first problem identified by the Capuchins upon their arrival to the valley was the question of religion. In the eyes of the Capuchins, the syncretic folk Catholicism that had been practiced in the Sibundoy Valley for centuries prior to their arrival required correction (Bonilla, 1968; McDowell, 1989, 1994). This "correction" took the form of the implementation of orthodox catechism and the establishment of mission schools for the indoctrination of Indigenous children. In the churches, indígenas were to learn the doctrine of orthodox Catholicism; in the schools, they were to learn Spanish and receive a Western education that would begin to redeem them of the state of "barbarism" and "savagery" that was thought to be natural condition of Indigenous people (Escandón, 1916; "Informes," 1913; Recalde, 2002). Indeed, churches and schools were the two primary and mutually reinforcing instruments of Capuchin power (Restrepo, 2006).[42] Taussig (1987) relates the zeal with which the missionaries set about their work in the early years of the mission:

> In 1899 there were only five Capuchins at work [in the Putumayo]. In two and a half years they performed 1,010 baptisms and 263 marriages. By 1927 there were 62 missionaries, 29 churches, 61 schools, two hospitals, five dispensaries, and 29 cemeteries. (p. 311)

The proliferation of churches facilitated the apparent conversion of the majority of indígenas to the orthodox form of Catholicism prescribed by the Capuchins within the first decades of the mission. In the schools, on the other hand, Indigenous children learned Spanish, to behave like their colono classmates, and to identify as Colombian before Indigenous, let alone Inga or Kamëntšá specifically (Bonilla, 1968; Bolaños, 2017; Gómez, 2005).

While Indigenous culture was under attack by the repression and impositions of the Capuchins, Indigenous land rights in the valley were being rapidly eroded by the large-scale immigration of colonos into the valley from other parts of Colombia, principally Nariño, the neighboring department of which Pasto is capital. This settlement was encouraged and aided by the Capuchins, who in 1902 founded the town of San Francisco to settle colonos apart from the Indigenous towns of the valley (Bonilla, 1968, p. 69). In 1911, the town of Sucre, today called Colón, was founded for the same purpose (p. 287). In both the Indigenous and the newly founded colono towns of the valley, the Capuchins introduced rectilinear urban planning, a style of settlement design contrary to Indigenous traditions. Colonial urban planning was essentially centralist, with settlements radiating from the central plaza dominated by a church and official buildings. This was the design according to which the Indigenous towns of the valley were transformed spatially and demographically. The influx of colono immigrants to the valley was part of a concerted plan on the part of mission and state authorities to advance the colonization of the Putumayo frontier in its broader extent (p. 106; Gómez, 2011, 2015).

How did the Indigenous communities of the valley respond to such considerable changes? In the first instance, many opted to abandon the towns of the central valley in favor of the less

[42] Foucault (1982) has written on the importance of schools as sites of discipline by which people are made subjects of power. Certainly this was true in the Capuchin mission and of schools in numerous other colonial situations. Quijano's (2000) notion of the coloniality of power is also applicable here; where better than in the schools of the mission to find all in one place the systems of hierarchies, of knowledge, and of culture that collectively establish and reify colonial power?

productive but more distant lands of its periphery. Faced with fanatical missionaries on the one hand and avaricious, land-stealing colonos on the other, many Indigenous families preferred the relative, if temporary, quietude of the surrounding hills or marshy valley floor. Characteristically, the Capuchins branded this choice as "ingratitude," but for the indígenas, it was an act of defiant autonomy (Bonilla, 1968, p. 71). When the Capuchins sought, using violent punishment, to incentivize those who abandoned the towns of the valley to return and repopulate them, they only encouraged further abandonment (p. 80). Similarly, it was common practice, in the early years of the mission, for Indigenous parents to prevent their children from attending mission schools; with the opening of the first schools, there was only one Indigenous student in Sibundoy and two in Santiago out of a population of several thousand Indigenous people in the vicinity of both towns (p. 72).

Increasingly threatened by the encroachments of colonos and the growing land holdings of the mission itself, aggrieved indígenas soon turned from abandonment and avoidance to outright insurgency, which continued sporadically through the first decade of the mission. Bonilla writes that

> [w]ith the slow advance of the White invasion and the hardening of the Capuchin proceedings, the traditional pacifism of the Sibundoys gave way to acts of terrorism, carefully directed towards the desisting of colono residence and of the work of the missionaries. (p. 82)

Such "terrorism" took the form of violence directed not against the missionaries, but against their property, including their prized livestock, which were sometimes killed overnight by anonymous Kamëntšá insurgents (p. 82). The Inga, too, employed "terrorism" to resist the advances of the colonos and missionaries, burning one missionary's ranch and maiming the apostolic prefect's horse (p. 83). This period of insurgency corresponds to the first two years of the mission, building on a legacy of Indigenous-settler conflict that began long before the formal establishment of the mission.[43]

Ultimately, however, such resistant practices—which recall James C. Scott's (1985) notion of "weapons of the weak"—proved unable to prevent the consolidation and expansion of the Capuchin mission. Gradually, as the power of the mission and its ability to exercise coercive force over the indígenas grew, and through cultural repression and the diligence of the Capuchin indoctrination efforts, the deculturating work of the missionaries began to take effect.

A telling example of the early success of Capuchin indoctrination is related by the Colombian engineer and traveler Miguel Triana, who visited the valley in 1906. Triana visited a mission school in the Inga town of Santiago in the western valley, where he witnessed the students singing the national anthem. This performance was followed by a speech given by a student named Manuel Tisoy, who was said to be the best in his class. Tisoy's speech ended with the proclamation that "we have now been raised from the condition of savagery," and then, "with our heads bowed, we beg, by God, that you [the missionaries and Triana, i.e., White Colombians] do not leave us strangled by the tangled thicket of barbarism" (Triana, 1950, p. 337). This scene demonstrates that, even at this early stage, the labor of the Capuchins had begun to work its transculturating effects; the singing of the national anthem by Indigenous children, their use of Spanish, and Tisoy's speech of subservience all

[43] The first reference I have found to anti-colono violence prior to the establishment of the mission occurred towards the end of 1902, when a group of Kamëntšá, angered by recent episodes of land theft, burned down the colono hamlet of Molina (Bonilla, 1968, p. 70). Land disputes of a less overtly violent nature began long before, however, in the colonial period.

indicate the apparent early "success" of the Capuchin project in instilling colonial culture at the expense of Indigenous traditions.

But to what extent was that "success" only apparent? Certainly, the Capuchins were successful in furthering many of their basic "civilizing" goals: indoctrination in orthodox Catholicism, teaching Spanish, and bringing the socioeconomic changes they associated with "civilization" into the valley and its Indigenous communities. That is by no means, however, to suggest that their efforts to deculturate the Indigenous communities of the valley were wholly successful.[44] Instead, the transcultural experience in the Capuchin period involved the rearticulation of Indigeneity through its concealment under the semantic overlay imposed by the missionaries. Additionally, the indígenas continued contesting and negotiating colonial power in the same ways as in earlier periods of the valley's history. Indigenous folklore, ethnomedicine, shamanism, and carnival are among the cultural domains which provide particularly compelling evidence of the rearticulation of Indigeneity during the Capuchin period, a phenomenon which I now explore in each.

The domain of folklore, especially the subset of orality that McDowell terms "the sayings of the ancestors," is an important one for the interpretation of Indigenous cultural rearticulation under the Capuchins. The Indigenous communities of the valley have long maintained an oral tradition which embodies a corpus of stories, myths, and popular wisdom reproduced since prehispanic times and which has incorporated foreign elements since the colonial encounter (McDowell, 1989, 1992, 1994; Juajibioy, 1987, 1989). According to McDowell, a careful distinction made between two self-contained but equally valid categories of narrative content—in Kamëntšá, *bngabe soy*, "our things," and *xkenungabe soy*, "White people's things"—is at the heart of the preservation of Sibundoy Valley mythic narrative (1994, p. 18).[45] Mythic narrative and folklore provided a space in which Indigenous cultures could articulate and make sense of their identities without expressly contravening the dictates of the Capuchins. This mediation was accomplished by situating narratives concerning precolonial themes, customs, beliefs, or characters ("the ancestors") in a prehispanic past clearly set apart from, but still influencing, the colonial present. "The tales of the ancestors," for instance, center on "the pivotal movement from the raw time to the time of fire, a formative period when the exemplary deeds of the ancestors established precedents for behavior that remain in force to the present moment" (McDowell, 1992, p. 100). This movement, typical of the whole domain of narrative associated with "the ancestors," establishes a direct historical through line between past and present in which "the sayings of the ancestors derive validity from their encapsulation of wisdom originating in ancestral times... [forging] a link across time, connecting the events of the present the sources of power and knowledge concentrated in earlier cosmic moments" (1989, p. 104). Although the sayings of the ancestors were located outside the Christian

[44] This is, in turn, not to suggest that the real deculturation experienced by the Indigenous communities of the valley was not highly destructive and traumatic. The intention here is to highlight the agency and adaptability of the Indigenous communities without downplaying the catastrophic nature of colonialism as experienced in the Sibundoy Valley and elsewhere.

[45] McDowell, expanding on this point, writes:

> There is a clear differentiation of this treasury of mythic narrative, which is marked by explicit cover terms, *antswanos* in Kamsá, and *antioj parlo* in Inga. The fact that this terminology proceeds from Spanish loan words suggests that the advent of the soldiers and missionaries brought a newfound need to distinguish the indigenous stories from other kinds of stories. Only those stories centering on the exploits of the ancestors merit inclusion in this category of narrative, and these stories are especially valued. The intrusion of extraneous narrative material, for example biblical stories or folk narrative brought in from Colombian national traditions, are censured by comments such as "stick to the old ones, Brother." (1989, p. 105)

domain, they did not conflict with it, and Sibundoy Valley indígenas could hold both as conceptually separate but equally valid—although in contexts of traditional narrative performance, the Indigenous was privileged above the foreign (p. 118).

The above description of Indigenous narrative accords with the pattern of accommodation—the situation of foreign elements within Indigenous cultural systems—that I have so far established as at work in several Indigenous cultural domains in the valley. But we can also see the process of concealment defined by Sandoval Zapata and Lasso Otaya (2014) at play in the narrative domain, specifically in its relation to what McDowell (1992) calls the "spirit realm" left over as "residue" from the primordial past of the pre-Christian ancestors (p. 126). The spirit realm consists of an "underground of time" on which the shamans of the Sibundoy Valley could draw in their syncretic magical and healing rituals. In Taussig's (1987) florid rendering:

> Such flowerings whereby an anterior epoch exerts its usually baneful influence on the present occur with the full or new moon, at dawn or at dusk—and we shall have reason to remember this flowering of an underground of time when we later consider the ways by which history itself acts like a sorcerer in the creator of *la mala hora*, the evil hour, in the Sibundoy Valley of Colombia. There, also, connections are made with what seems like an underground of pre-Spanish conquest 'other' time, and while this buried epoch flowers in quasi-satanic form to bewitch the present, and even kill, this very same deposition of history can be appealed to for healing as well. (pp. 229-30)

If ancestral knowledge—and its reputation for bestowing magical powers greater than those accessible in present, post-conquest, Christian time—is recovered through spiritual vision in the modern period, marked (or marred) by the advent of missionaries and Catholicism, its recuperation through the use of rituals and shamanic technologies banned by the mission suggests a resistance to colonially imposed thought. Here we catch a glimpse of a magical past concealed by a mundane present, officially and ordinarily off-limits according to the dictates of the mission, but still clandestinely drawn upon by narrative and shamanic techniques which revalorize the Indigenous past.

Ethnomedicine is another domain which demonstrates the interplay of accommodation and concealment as processes of Indigenous cultural rearticulation. The ethnomedical system of the Kamëntšá, similar but not identical to that of the Inga, has been thoroughly described by the medical anthropologist Haydée Seijas (1969). Seijas describes a situation of coexistence between two medical traditions, the Indigenous and the Western. The former is represented by traditional household curers and medicine men, and the latter by drugstore attendants, a clinician priest, and the staff of the one hospital in the valley at time of writing (pp. 35-38). At the time that Seijas was resident in the valley, from the mid-to-late 1960s, the Indigenous medical tradition remained not only a viable alternative to the Western system, but the preferred option for most of the Indigenous population, particularly when treatment was sought for diseases thought to be of mystical origin. As Seijas writes,

> [a]lthough the services of non-Indian practitioners—as well as patent drugs—are used by many concurrently with curing ceremonies in cases thought to be mystically caused, the [Kamëntšá] maintain that diseases caused by evil wind or by sorcery can be treated successfully only by Indian specialists. (p. 133)

The preference shown for Indigenous specialists over Western practitioners—which is partly a matter of the greater cost of the latter, but also explicable on a cultural basis (pp. 154-55)—

especially in cases of illnesses thought to have a mystical basis, demonstrates greater valorization of Indigenous medical traditions than Western ones. Also important is that the Indigenous medical tradition is intrinsically related to the domains of Indigenous narrative, spirituality, and ethnobotany, since the etiological categories of Indigenous ethnomedicine emphasize the ultimate (i.e., supernatural) as opposed to the immediate (i.e., material, biological) causes of disease, and the healing rituals that seek to address those causes involve both the supplication of supernatural forces of a syncretic nature and the use of plant medicines such as yagé (pp. 110, 136). The choice exercised by indígenas to valorize traditions in the Indigenous domains—from traditional mythic narrative to spirituality, from ethnomedicine to ethnobotany—may be read as a conscious decision to prioritize those domains over, or at least alongside, categories imposed by colonialism. Concealment, on the other hand, is evinced in the clandestine perpetuation of prehispanic shamanic and ethnomedical[46] traditions under the overlay of a syncretic Catholicism and despite the prohibitions of Capuchin authorities—prohibitions which were effectively unenforceable (Bristol, 1965, 1966, 1969; McDowell, 1989, 1994; Ramírez & Castaño, 1992; Sandoval Zapata & Lasso Otaya, 2014; Schultes, 1988; Seijas, 1969; Tausig, 1987).

Accommodation and especially concealment are again at play in another significant domain: that of Indigenous festivities. The most notable example is the Carnival of Pardon,[47] the primary annual festivity celebrated in the valley. The carnival evinces symbolic and performative syncretism, incorporating both Indigenous and Catholic motifs and traditions, with the Indigenous elements constituting a greater share of the whole (Castaño, 2021; Quiñones Triana, 2019; Tobar & Gómez, 2004). McDowell (1992) writes of the regenerative and tradition-reifying function of the carnival, during which "the ancestors appear to walk the earth once again, and the modern people renew their contract with the ancestral model" (p. 110), while for Sandoval Zapata and Lasso Otaya (2014), the Indigenous festivities present a total subversion of Catholic ritual:

> [H]ere we witness a double concealment: on the one hand to deny, on the other to resist. The Catholic church assumes a degree of control and influence over the Indigenous ritual upon introducing the Carnaval del Perdón via a mass and speaking sporadically in Inga or Kamëntsá, but it is observed in the mass that what really happens is a seizure of the church. The colorful clothes of the Indians pack the place; the drums, the dulzainas, the flutes and the shouts counterpose the near-total silence that customarily accompanies the mass. (p. 51)

Although the Indigenous festivals have been subject to the same syncretism as the other domains we have interpreted, Indigenous agency has bent colonially imposed elements in this domain to Indigenous ends in a process of quiet subversion. In the carnival, the Catholic mass is Indigenized, turned on its head; Indigenous traditions are expressed and celebrated in the same sites of power from which the Capuchin fathers proclaimed their repressive dictates and decried Indigenous customs as "savage" and "barbaric." Here, again, the Indigenous communities of the valley have weaponized the colonial cultural overlay imposed on them in

[46] While shamanism and ethnomedicine are closely intertwined in the Sibundoy Valley, they are not synonymous. Shamans are referred to generically as *taitas* (a loanword from the Quechua "father," this term also refers to any respected male elder or authority figure) and sought out for cures concerning both physical and spiritual ailments. Household curers specialize primarily in the treatment of physical ailments using botanical remedies. Taitas also generally double as respected community leaders, while household curers enjoy a less privileged social status (Seijas, 1969).

[47] *Carnaval del Perdón*. Known in Kamëntšá as Clëstrinye o Bëtsknaté, with variable orthography.

order to rearticulate their Indigeneity. Taussig (1987) may be right when he writes that "Indianness in outward display was recast into a thing that could be exhibited under controlled circumstances only" (p. 311-12), but he misses that sometimes it was the indígenas who controlled the circumstances.

The strategies of accommodation and concealment discussed above are not unique to the domains interpreted but permeate all aspects of Indigenous culture in the Sibundoy Valley. If it is true that in many respects the Capuchins and other agents of colonial power managed to effect a degree of deculturation over the Indigenous cultures they sought to suppress, it is nonetheless clear that Indigenous cultural domains such as narrative, religion, shamanism, ethnobotany, ethnomedicine, festivities, and others have maintained their integrity to a remarkable degree. This has been accomplished through processes of accommodation and concealment employed as primary adaptive strategies in the Sibundoy Valley—the first building on a deep tradition dating to prehispanic times, the second developing as a novel cultural survival strategy during the Capuchin period. The preceding analysis of both strategies as they have operated in various contexts and in different cultural domains demonstrates their efficacy in preserving the overall cultural integrity of the Indigenous peoples of the valley while mitigating the transculturating effects of the colonial encounter.

4. CONCLUSION

The Sibundoy Valley is, in some respects, unexceptional with respect to its history of transculturation, whether prior to or following the colonial encounter and its long shadow. The Sibundoy Valley is not unique as a site of encounter between cultures of different origins in the prehispanic era—Andean on the one hand, Amazonian on the other. To varying degrees and at different times and places, this type of encounter occurred along the length of the Andes-Amazon interface. Nor are the indígenas of the Sibundoy Valley necessarily distinctive in terms of the strategies they employed to negotiate transculturation and to preserve and rearticulate their cultures following the colonial encounter. Indeed, it is the typical character of transculturation as it has occurred in the Sibundoy Valley that makes it an excellent case study for the operation of transculturation in general and under a variety of historical conditions—pre-colonial, colonial, and post-colonial. By tracing the historical experience of transculturation in the Indigenous communities of the Sibundoy Valley, from the prehispanic period through the Spanish colonial period and the Capuchin mission of the twentieth century, I have demonstrated that the Indigenous cultures of the valley have rearticulated and reproduced themselves by selectively incorporating foreign cultural elements into an adaptable and preexisting Indigenous framework. By this operation, they have undergone the triadic loss-gain-creation process that defines transculturation in general, resulting in the emergence of novel and resilient Indigeneities that have survived the challenges of the past in order, now, to face those of the present. In this respect, the case of the Sibundoy Valley has much to offer for a cross-cultural analysis of Indigenous transculturation and cultural survival in colonial situations in general.

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Activation of Defense Mechanisms in the Nudibranchs *Peltodoris nobilis* and *Hermissenda crassicornis*

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ABSTRACT

Nudibranchs are marine invertebrates that use various defenses to deter predators. *Peltodoris nobilis* is a member of the superfamily Doridoidea and uses *de novo* chemical synthesis for defense. *Hermissenda crassicornis* is a member of the superfamily Aeolidioidea and uses nematocyst sequestration for defense. Past research explains the function and evolution of defenses in nudibranchs; however, it is unknown whether these defenses are active or passive. The goal of this research was to determine if the defense mechanisms in *P. nobilis* and *H. crassicornis* are active or passive and if one method is more effective at preventing predation than the other. It was hypothesized that the activation of defense mechanisms in both nudibranch species was active and that the defenses were equally effective at preventing predation. This hypothesis was tested by comparing the contact times of a juvenile *Glebocarcinus oregonensis* crab—a predator of nudibranchs—with an anesthetized and non-anesthetized nudibranch. There was no statistical difference in crab contact times between the anesthetized and control *P. nobilis* nudibranchs; however, the anesthetized *H. crassicornis* contact times with the crabs were statistically higher than the control. This suggests that the release of chemicals produced *de novo* in *P. nobilis* is passive, while the firing of sequestered nematocyst by *H. crassicornis* is active. The results also indicated that the control *H. crassicornis* contact times with the crabs were statistically lower than those of *P. nobilis*; however, the crabs demonstrated little predatory behavior across all trials. Therefore, this study cannot conclusively determine which defense mechanism is more effective at preventing predation.

1. INTRODUCTION

Nudibranchs ("nudi" [naked] "branch" [gill]) are marine invertebrates found in subtidal and intertidal zones around the world. Commonly known as sea slugs, they are members of the phylum Mollusca, class Gastropoda, and order Nudibranchia (WoRMS 2021). The order Nudibranchia consists of marine slugs that, unlike most other members of the class Gastropoda, do not have a shell for defense as adults. Biologists have posited that over time, the evolution of new defense mechanisms in nudibranchs made the protection offered by the shell unnecessary (Faulkner 1983). These new defense mechanisms are derived from nudibranchs' prey: specifically, nudibranchs use chemicals or organelles obtained from their prey for their own defense.

There are several superfamilies within the order Nudibranchia, including Doridoidea and Aeolidioidea, each with distinguishing features and defense mechanisms. Doridoidea (dorid) nudibranchs have an exterior gill plume at the posterior of the animal used for respiration and papillae (tiny bumps similar to those on the human tongue) on their dorsal side (Figure 1). *Peltodoris nobilis* is a dorid nudibranch characterized by their bright yellow coloring (Figure 2). Aeolidioidea (aeolid) nudibranchs have

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tentacle-like dorsal papillae called cerata along their body that resemble anemone tentacles (Figure 1). Cerata are responsible for respiration and contains outfoldings of the digestive diverticula (Pechenik 2015). *Hermissenda crassicornis* is an aeolid nudibranch with bright red, orange, and blue on their cerata (Figure 3).

Dorids use *de novo* chemical synthesis to deter predators by creating new chemicals from the chemicals obtained from their prey. *De novo* chemical synthesis refers to the production of complex molecules from simple molecules. Dorids prey on sponges (phylum Porifera) and use the chemicals produced by their prey in a couple of ways (Faulkner and Ghiselin 1983). First, they retain pigments from the prey to use as camouflage when feeding on that prey. This is considered a passive defense, since body coloration does not change in response to the nudibranch's environment (Faulkner and Ghiselin 1983). Second, they use *de novo* chemical synthesis to convert the chemicals from their food into different chemicals for defense (Faulkner and Ghiselin 1983). When chemicals are found in the tissue or glands of an animal but not in their digestive gland, it provides evidence that *de novo* synthesis has occurred (Cimino 1999). In dorids, these chemicals are stored in the skin glands.

Instead of using *de novo* synthesis like dorids, aeolid nudibranchs use nematocyst sequestration for their defense, which entails the storage and firing of nematocysts produced by prey to defend the nudibranch from predators. Aeolid nudibranchs prey on members of the phylum Cnidaria, which includes jellyfish, sea anemones, and hydroids among others. Members of this phylum have organelles called cnidae (meaning "a nettle" or "a stinging thread") that are used for prey capture, defense, and sometimes locomotion (Pechenik 2015). There are several types of cnidae; however, aeolids sequester the most common category of cnidae called nematocysts (meaning "thread bag") (Pechenik 2015). The sting from the cnidae kills or immobilizes the animal's target long enough for the cnidarian to escape predators or consume prey. Aeolid nudibranchs feed on hydroids and sequester their preys' nematocysts to use for their own defense (Goodheart 2016). The nudibranchs store the nematocysts in their functional state in the tips of their cerata, and, when attacked by a predator, the nudibranchs forcibly eject the nematocysts through a small pore on the cerata tip, rupturing the cell membrane and releasing the nematocysts in the form of mucus, which stings the target (Anthony 2016).

Existing research describes the evolution and function of de novo chemical synthesis and nematocyst sequestration. It also suggests that the adaptation of chemical defenses is a driving evolutionary force for nudibranchs, providing insight into their adaptive radiation (Cimino 1999). There is no research, however, on whether the release of chemicals produced *de novo* and the firing of sequestered nematocysts are voluntarily activated by the animal in response to the environmental (active) or are constantly functional (passive). There is also no research comparing the effectiveness of defense mechanisms in dorid nudibranchs to aeolid nudibranchs. Exploring these questions will increase our understanding of the adaptation of chemical defenses over time and their benefits to the animal, which could provide insight into the direction of future adaptations and predator-prey relationships.

2. LITERATURE REVIEW

Hermissenda crassicornis (Eschscholtz, 1831) and *Peltodoris nobilis* (MacFarland, 1905) are found along the Pacific coast from Alaska to California. They are both found in the low intertidal zone, on rocky shores, and in marinas. The common names of *H. crassicornis* are the thick-horned aeolid and the northern opalescent sea slug. These slugs can reach up to 80 mm long and are extremely

aggressive (and occasionally cannibalistic) nudibranchs (Wheeling 2002). The common name of *P. nobilis* is the false sea lemon. They can reach up to 260 mm and give off a lemon scent when disturbed (Rudman 2000).

Existing research describes defense mechanisms used by *P. nobilis, H. crassicornis*, and related species (Edmunds 2016, Faulkner & Ghiselin 1983, Goodheart & Bely 2016). Camouflage is a common defense mechanism in dorids, and there is no evidence to support coloration as a warning to predators (Edmunds 2016). Acid secretion as a defense against predators has also been observed in some dorid species, such as *Anisodoris stellifera* (a genus to which *P. nobilis* previously belonged). The most important defensive glands in *A. stellifera* are large subepidermal acid glands, and other non-mucus skin glands are mostly absent. Most dorids are also unpalatable to fish, potentially due to the non-mucus skin glands (Edmunds 1968). Further, the genus *Phyllidia* is known to produce a poisonous secretion; however, the defensive glands of other dorids are not well studied (Edmunds 1968). *P. nobilis* does produce a fruity odor when disturbed, but it is only speculated as to whether this deters predators (Rudman 2000). *P. nobilis* also possess the secondary metabolite 1-Methylguanosine, which potentially serves as a defense or signaling molecule, and a degraded sesquiterpenoid that acts as an odiferous compound, which may also be used for defense (Dean & Princep 2017). One study also found that aqueous extracts of the digestive gland of *P. nobilis* were lethal to shore crabs and mice when injected with it, indicating that *P. nobilis*' tissue is toxic (Fuhrman et al. 1979).

H. crassicornis uses ceratal autotomy and nematocyst sequestration as defense mechanisms against predators (Miller 2005). Ceratal autonomy occurs when a nudibranch releases cerata from their body to avoid capture by a predator. Nematocyst sequestration is extensively researched in aeolid nudibranchs, particularly in *H. crassicornis* (Anthony 2014, Goodheart & Bely 2016), although it is unknown if *H. crassicornis* is one of these species. It is also unknown how long *H. crassicornis* retains these sequestered nematocysts (Anthony 2016).

The function and composition of cnidae in Cnidarians is well-studied. Cnidae are organelles in cells called cnidoblasts (or nematoblasts), and there are three main groups of cnidae. Nematocysts are the best-studied and most common group of cnidae, with over 30 different types of nematocysts recorded in literature. While some literature uses "nematocyst" and "cnidae" interchangeably, it is more common to use the term nematocyst only when referring to this most common group. All cnidae are composed of a proteinaceous rounded capsule with an opening covered by a hinged operculum. In the capsule, there is a coiled tube that rapidly everts and shoots out of the cell during discharge, triggered by surface chemoreceptors on nearby cells and by chemical and tactile stimulation sensed by a cluster of cilia, called the cnidocil, that project from the cnidoblast (Figure 4). Osmotic pressure is the primary force behind the discharge of cnidae (Pechenik 2015).

Over the years, there have been some noteworthy changes made in the taxonomy and nomenclature of these nudibranchs. *P. nobilis* was previously referred to as *Montereina nobilis, Anisodoris nobilis,* and *Diaulula nobilis*, names which still appear in the literature. "*Peltodoris nobilis*" is the currently accepted name (Rudman 2000). *H. crassicornis* was previously referred to as *Phidiana crassicornis* and *Cavolina crassicornis*; however, these names are currently unaccepted (WoRMS 2022). Both superfamilies are in the infraclass Opisthobranchia, which commonly appears in literature. However, this term is currently an abandoned concept, and its status is uncertain (WoRMS 2021).

3. PURPOSE OF INVESTIGATION AND PROJECT DESCRIPTION

There already exists extensive research into the chemical ecology and evolution of defense mechanisms in nudibranchs; however, no research has been done on the activation of defenses. Activation and effectiveness of defense mechanisms are crucial elements of predator defenses in organisms. Knowing if activation is active or passive and if one method is more effective than the other will provide deeper insight into the mechanisms of evolution and the adaptive radiation of nudibranchs, increasing our knowledge of driving evolutionary forces, diversity, and potentially, the direction of future adaptations of defense mechanisms in these species. Understanding these dynamics is of particular importance as climate change continues to cause rapid deterioration and change in ocean ecosystems. Increasing our knowledge of evolution and adaptive radiation in species that are at the intermediary trophic level will allow scientists to predict the effects of climate change on many different species that live in a similar ocean habitat.

My research sought to answer two questions. First, is the release of defensive chemicals produced *de novo* in *Peltodoris nobilis,* and is the firing of sequestered nematocysts in *Hermissenda crassicornis* active or passive? Active defense mechanisms are voluntarily released based on contact with a predator, while passive defense mechanisms are constantly functional and do not depend on contact with a predator. Second, is chemical defense or sequestration of cnidae a more effective means of preventing predation? The more effective defense mechanism should result in a statistically lower contact time between the control nudibranch and the predator, thus better preventing predation than the other. I hypothesized that the defense mechanisms for both nudibranchs were active (indicated by a statistical difference between the control and anesthetized contact times) and equally effective at preventing predation.

These hypotheses were tested by comparing the contact time of an anesthetized and control nudibranch with a predatory crab. If the amount of contact time was greater for the anesthetized nudibranch than the control, the release of defense chemicals was considered active. This means that the animal voluntarily releases the chemicals or fires the nematocysts sequestered in their cerata. If there was no difference in the contact times, then the defense was considered passive. This means that the chemicals produced *de novo* in dorids are constantly being released, or that the sequestered nematocysts stored in the cerata of aeolids are still fired when the nudibranch is unable to voluntarily fire them. To determine if one defense mechanism was more effective, the total amount of time the crab spent in contact with the control dorid and aeolid nudibranchs was compared. If there was no significant difference between the control contact times with the crab, neither was more effective. If the crab spent less time in contact with the control of one species than the other, that species was assumed to have the more effective defense mechanism.

4. METHODS

The dorid nudibranch used for this experiment was *Peltodoris nobilis* and the aeolid nudibranch was *Hermissenda crassicornis*. Specimen and data collection occurred from September 28, 2021 to December 3, 2021. Nudibranchs were collected from E dock or the Shanks light trap at the Charleston Marina in Charleston, Oregon (Figure 5). Nudibranchs were collected up to one week prior to an experiment and kept in separate containers in a sea table with sponges or hydroids for food. The crabs used for this experiment were juvenile *Glebocarcinus (Cancer) oregonensis*, also known as the Pygmy Rock Crab. Crabs were collected from the Shanks light trap or buoys

attached to F dock (Figure 5). They were collected on the day of the experiment or the day prior. Juvenile crabs were used because their mouth parts are not as well-defended and are more susceptible to injury than those of adult crabs, resulting in a stronger reaction to nudibranch defenses. For each trial, 1 crab and 2 nudibranchs (1 control and 1 anesthetized) were used. No crabs or nudibranchs were reused for a different trial.

For the *P. nobilis* trials, 2 nudibranchs of roughly the same size were transferred from the sea table into separate glass containers. One glass container was filled with 200 mL of sea water (control) and the other with 100 mL of sea water and 100 mL of 7% Magnesium Chloride (MgCl2) (anesthetized). Lids were placed on top of the containers to prevent escape, and the container with the nudibranch in the treatment was labeled using a piece of paper towel (Figure 6). Nudibranchs were left in the containers for at least 2 hours or until they were fully anesthetized. The nudibranchs were considered fully anesthetized when they no longer recoiled when the gill plume was touched. During this time, crabs were collected from the Charleston Marina or the sea table (if they had been collected the day prior) and placed into separate, smaller glass containers.

Once the nudibranch in MgCl2 was fully anesthetized, the control or anesthetized nudibranch was transferred to a separate glass container with 200 mL of sea water. A crab was placed right next to the nudibranch in the container, so that they were close to or barely touching, and a timer was set for 5 minutes. The time the crab and nudibranch remained in contact was observed during those 5 minutes by watching during the trial and recorded with a stopwatch. If the crab and nudibranch began the trial touching, the stopwatch was started as soon as either individual moved while remaining in contact. Contact included any part of the crab and nudibranch, whether the crab was entirely on the nudibranch or just a claw was touching. After 5 minutes, the crab was removed from the container, and the carapace (shell) length was measured. The crab was then placed back in the same container used during the preparation for the experiment for another 5 minutes. During this time, the length of the control and anesthetized nudibranchs was measured and recorded. After 5 minutes, the second nudibranch was transferred with the same crab to a new container—again, with 200 mL of sea water—for another 5 minutes. Contact was observed and recorded, and once the time was up, the crab was removed.

This process was repeated for all trials, alternating whether the control or anesthetized nudibranch was exposed to the crab first. The behaviors of the crabs and nudibranchs during the trials were also recorded. Predatory behavior in crabs was indicated when they repetitively moved their front chelae towards their mouth while in contact with the nudibranch. After all trials for the day were completed, the nudibranchs and crabs were released on the same dock from which they were collected, far enough (43.345614, -124.323141) from the collection site (43.345048, -124.323034) that there was no chance of reusing a nudibranch (Figure 5).

H. crassicornis trials were completed in an identical manner, with two slight differences: the nudibranchs were transferred into a smaller glass container with 75 mL of sea water during the trial due to their smaller size. Also, *H. crassicornis* nudibranchs were considered anesthetized when they no longer moved in response to touch or laid upside down on the bottom of the container.

18 trials were completed for *H. crassicornis*, and 10 trials were completed for *P. nobilis*. The number of trials across the two species differed due to sampling limitations (differences in the number of specimens found in the field). The data were analyzed with Microsoft Excel. A one-way ANOVA compared the contact time with a crab between the control and anesthetized nudibranchs. A separate one-way ANOVA was also

used to compare the sizes of the control and anesthetized nudibranchs used in experiments for the same purpose. A graph with standard error compared the control contact time with a crab between *P. nobilis* and *H. crassicornis* trials. One-sample t-tests compared the length of the control nudibranchs, the anesthetized nudibranchs, and the carapace size of the crabs used in the experiments to determine if variation in sizes influenced results.

5. RESULTS

5.1. *PELTODORIS NOBILIS*

Predatory behavior—crabs moving their front chelae to and from their mouths while in contact with the nudibranchs—was observed in 3 of the 10 trials and only with anesthetized nudibranchs. In 8 of the 10 trials, the crabs hid their back legs under the control nudibranchs; in the other 2 trials, there was little to no contact with either the anesthetized or control nudibranchs. In 2 trials, the control nudibranchs released mucus, and in 1 trial, the anesthetized nudibranch had previously released mucus. In 1 control trial where mucus was observed, the crab avoided the nudibranch after coming into contact with the mucus. Crabs did not express predatory behavior in trials where mucus was present (Table 1).

A one-way ANOVA indicated that there was no significant difference in the contact times with crabs between the anesthetized and control *P. nobilis* ($F_{1,18} = 0.23$, $p = 0.632$) (Table 2). The average contact times with crabs for the control and anesthetized nudibranchs were 167 seconds (SD ± 106 seconds) and 193 seconds (SD ± 129 seconds), respectively (Table 3).

The average carapace length of the crabs used in these trials was 10.3 mm (SD ± 3.59 mm). The average control and anesthetized nudibranch lengths were 7.55 cm (SD ± 1.98 cm) and 7.24 cm (SD ± 1.84 cm), respectively (Table 2). To confirm that variations in nudibranch and crab sizes did not affect results, one-sample t-tests found no significant difference for the crab carapace lengths ($t9 = 0$, $p = 0.5$), control nudibranch lengths ($t9 = 0$, $p = 0.5$), and anesthetized nudibranch lengths ($t9 = -0.017$, $p = 0.5$). A one-way ANOVA also found no significant difference between the control and anesthetized nudibranch lengths ($F_{1,18} = 0.13$, $p = 0.72$) (Table 2).

5.2. *HERMISSENDA CRASSICORNIS*

Predatory behavior was observed in 10 of the 18 trials, and no predatory behavior was observed in the remaining 8. Predatory behavior was observed between the crab and anesthetized nudibranchs in 8 of those 10 trials, with the control and anesthetized nudibranch in 1 trial, and with just the control nudibranch in the remaining trial. There was no predatory behavior in 16 of the 18 control trials. In 4 of the 16 trials, the nudibranch initiated the contact, and in 2 of those trials, the crab moved to avoid the nudibranch. In 3 control trials, the nudibranchs moved to avoid the crab. In 7 trials, the crab avoided or ignored the control and anesthetized nudibranch. In 1 trial, cerata were observed to continue moving after they were removed from the body of the nudibranch—either by ceratal autotomy or the crab—which could have implications for future research (Table 4).

A one-way ANOVA indicated that the crab's contact time was significantly higher for the anesthetized *H. crassicornis* than the control ($F_{1,34}=9.37$, $p=0.004$) (Table 5). The average contact times with crabs for the control and anesthetized nudibranchs were 7 seconds (SD ± 13 seconds) and 86 seconds (SD ± 108 seconds), respectively (Table 6).

The average carapace length of the crabs used in these trials was 9.66 mm (SD ± 3.55 mm). The average control and anesthetized nudibranch lengths were 2.26 cm (SD ± 0.90 cm) and 2.11 cm (SD ± 0.70 cm), respectively. To confirm that variations in nudibranch and crab sizes did not impact results, one-sample t-tests found no

significant difference in crab carapace lengths (t17 = 0.007, p = 0.5), control nudibranch lengths (t17 = 0.031, p = 0.5), and anesthetized nudibranch lengths (t17 = 0.006, p = 0.5). A one-way ANOVA found no significant difference between the control and anesthetized nudibranch lengths (F1,34 = 0.57, p = 0.57) (Table 5).

6. DISCUSSION

6.1. ACTIVATION OF DEFENSE MECHANISMS

6.1.1. *PELTODORIS NOBILIS*

There was no significant difference between the control and anesthetized nudibranch contact times with the crabs (F1,18=0.23, p>0.05). This indicates that the release of chemicals produced *de novo* is passive in *Peltodoris nobilis*. Overall, the crabs exhibited little predatory behavior with the anesthetized nudibranchs and no predatory behavior with the control nudibranchs. The average contact time for the control and anesthetized nudibranchs was 167 seconds (SD ±106 seconds) and 193 seconds (SD ± 129 seconds), respectively—more than half the duration of the trials. This lack of predatory behavior coupled with the high contact time suggests that while the chemicals produced by *P. nobilis* via *de novo* chemical synthesis appear to prevent predation, they do not prevent contact with predators. It is possible that the crabs did not demonstrate predatory behavior due to their placement in an unfamiliar environment; however, since members of the same species demonstrated predatory behavior with *Hermissenda crassicornis* after experiencing the same treatment, this is not very likely.

The prevention of predation without the prevention of contact may be due to chemicals produced *de novo* that signal that the nudibranch is poisonous or tastes bad. Previous studies have identified 1-Methylguanosine, which potentially serves as a defense or signaling molecule, and a degraded sesquiterpenoid, which acts as an odiferous compound in *P. nobilis* (Dean & Princep 2017), as possible culprits. The presence of these molecules, coupled with evidence from previous studies supporting the toxicity of *P. nobilis* tissue, could potentially explain the lack of predation by the crabs (Fuhrman et al. 1979). Crabs have excellent senses of taste and smell; once they come into contact with potential prey, they can taste and smell them using setae on their appendages, and both pairs of their antennae are primarily sensory (Pechenik 2015). Crabs could therefore interpret if the chemical signals produced by nudibranchs indicated that they were poisonous or tasted bad. These chemicals do not appear to prevent predation by all predators, however, as one nudibranch was taken out of the collection container and consumed by a seagull during collection at the docks.

Nudibranchs released mucus in 3 of the trials (2 by the control nudibranch and 1 by the anesthetized). In trial 4, the crab got caught in the mucus and actively tried to get it off and escape. After escaping the mucus, the crab did not attempt contact again. In all 3 trials where mucus was released, there was no contact between the crab and nudibranch. This suggests that mucus also works as a predator deterrent for *P. nobilis*, and it appears to be more effective at preventing any contact with a predator than released chemicals. The presence of toxins in mucus could potentially explain this observation; however, the composition of the mucus produced by *P. nobilis* is unknown. Sea slugs in the superorder Sacoglossa produce mucus with ichthytoxic activity, but it is unknown if the mucus produced by dorids is toxic (Di Marvo et al. 1993).

6.1.2. *HERMISSENDA CRASSICORNIS*

The contact times between the crabs and the control nudibranchs were significantly lower than those between the crabs and the anesthetized nudibranchs (F1,34 = 9.37, p = 0.004). This

supports the hypothesis that the firing of nematocysts obtained through nematocyst sequestration is active. The crabs exhibited predatory behavior in 10 trials, indicating that they would eat the nudibranchs given the opportunity. However, in 2 control trials, the *Hermissenda crassicornis* initiated contact with the crabs, and the crabs moved to avoid the nudibranch. The predatory behavior of crabs in some trials coupled with the crab's avoidance of nudibranchs in others suggests that this defense mechanism is successful at preventing predation. Control nudibranchs also used movement to avoid the crabs; however, the crabs moved much faster, so this method was not very effective if the crab pursued the nudibranch.

6.2. DETERMINING EFFECT OF SPECIMEN SIZE VARIATION ON RESULTS

One-sample t-tests found no significant difference in the sizes of the crabs, the control, or the anesthetized nudibranchs used for the *P. nobilis* and *H. crassicornis* trials. Variations in crab size could potentially influence results because the mouth parts of larger—and consequently, older—crabs are better-defended than those of younger crabs. Larger crabs would therefore be less affected by defense mechanisms, which could increase contact time for the larger crabs. Inversely, larger nudibranchs could contain more chemicals or nematocysts than smaller nudibranchs, increasing their defensive capabilities and consequently decreasing contact time. However, since no statistical differences in size were found, it can be assumed that the differences in contact time were strictly due to the effectiveness of the defense mechanism and not influenced by size variation. For both species, there was no significant difference between the control and anesthetized nudibranch lengths. This indicates that variation in size between the control and anesthetized groups did not influence the results.

6.3. EFFECTIVENESS OF DE NOVO CHEMICAL SYNTHESIS VS. NEMATOCYST SEQUESTRATION

I hypothesized that the average control nudibranch contact time with the crab would be lower for the more effective defense mechanism. It was determined that the average contact time for the control *H. crassicornis* trials was significantly lower than *P. nobilis* (Figure 9). This suggests that the *H. crassicornis* defense mechanisms were more effective at preventing predation. However, minimal predatory behavior was observed in the crabs during the *P. nobilis* trials, despite the high contact time. Consequently, the control contact times of the *P. nobilis* trials do not accurately reflect the effectiveness of the release of chemicals produced *de novo* at preventing predation, since little predatory behavior was observed during contact. Therefore, while *H. crassicornis* defense mechanisms did a better job of preventing contact between the predator and the nudibranch, this study cannot determine if nematocyst sequestration is more effective at preventing predation than *de novo* chemical synthesis.

7. CONCLUSION

My research sought to answer two questions. First, is the release of defensive chemicals produced *de novo* in *Peltodoris nobilis*, and is the firing of sequestered nematocysts in *Hermissenda crassicornis* active or passive? Second, is chemical defense or sequestration of cnidae a more effective means of preventing predation?

There was no significant difference in crab contact time between the control and anesthetized nudibranchs for *P. nobilis* ($F_{1,18} = 0.23$, $p > 0.05$). I therefore concluded that the release of chemicals synthesized *de novo* as a defense mechanism is passive in this species. The high contact time with the crab for the control and anesthetized nudibranchs, coupled with a lack of predatory

behavior, indicates that the chemicals produced *de novo* do not prevent contact between the predator and prey but may prevent predation. For *H. crassicornis*, the contact time between the anesthetized nudibranchs and the crabs were significantly higher than the contact time with the control nudibranchs ($F_{1,34} = 9.37$, $p = 0.004$), suggesting that nematocyst firing is active in this species.

Predator defenses and the activation of these defenses are important to the survival of an individual and the species as a whole; therefore, understanding these defenses can provide deeper insight into the mechanisms of evolution and adaptive radiation of nudibranchs. This, in turn, increases our knowledge of driving evolutionary forces, diversity, and potentially, the direction of future adaptations in these species. Determining that members of the order Nudibranchia possess both active and passive defense mechanisms is indicative of high levels of adaptive radiation, which is also reflected in the morphological and prey preference differences between species. This research, coupled with other research on nudibranchs, also provides a point of reference for the current diversity of nudibranchs. This will allow for the comparison and continuation of research on adaptive radiation in these species as ocean ecosystems face rapid deterioration due to climate change. As intermediary trophic level species, nudibranchs are of particular interest in determining the effects of climate change in marine habitats, since changes in these species can impact or reflect changes in entire ecosystems.

In a few trials, *P. nobilis* released mucus and *H. crassicornis* moved to avoid contact with the crab, and in other trials, cerata were detached from the nudibranch's body but still moved. Future experiments could study mucus as a potential defense mechanism of dorid nudibranchs. Another future area of research could focus on comparing the effectiveness of defense mechanisms. The findings from such studies could provide insight into the direction of future adaptations in nudibranchs and their interactions with predators. For *P. nobilis*, it may be more beneficial to complete this experiment with adult crabs instead of juveniles due to their larger size and the lack of predatory behavior displayed by the juvenile crabs. It would be useful to see if the lack of predatory behavior changed with adult crabs. A final future area of study could be devoted to determining if the cerata of *H. crassicornis* can still fire nematocysts when separated from the nudibranch's body. Previous research on *H. crassicornis* concludes that ceratal autotomy, or the release of cerata, is a method used by nudibranchs to avoid predation (Miller 2005). There is no research, however, on the movement of cerata after separating from the body or whether the cerata can still fire nematocysts in this state.

8. FIGURES

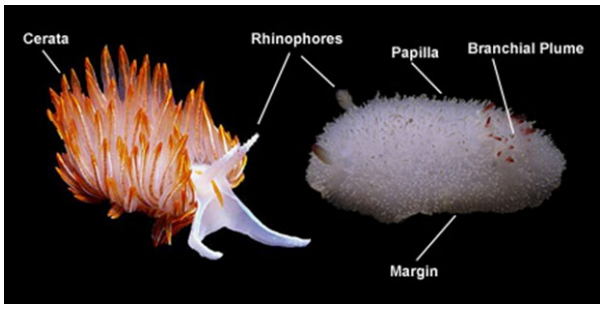

Figure 1: Anatomy of Aeolid and Dorid Nudibranchs. The basic anatomy of an aeolid (left) and dorid (right) nudibranch. For dorid nudibranchs, the margin is also referred to as the mantle, the branchial plume as the gill plume, and the papilla as dorsal papilla.

Figure 2: Image of *Peltodoris nobilis*. Photo taken off San Miguel Island, California by Bruce C. Wight (2000).

Figure 3: Image of *Hermissenda crassicornis*. Photo taken in Cape Flattery, Washington by Brooke Reiswig (2006).

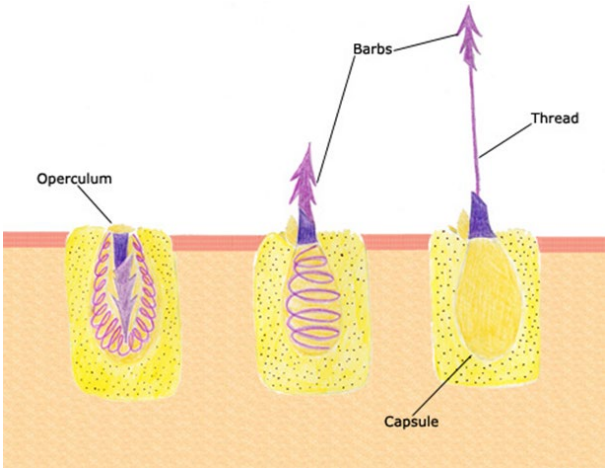

Figure 4: Diagram of a nematocyst firing. An image depicting the stages and anatomy of a nematocyst firing. The stages are the unfired (left), firing (middle), and fired (right) nematocyst. Nematocysts also contain cnidocils, or clusters of modified cilia, on the outside of the cnidoblast (the cell) that sense chemical or tactile stimulus and trigger discharge.

Figure 5: Image of specimen collection and release locations. A Google Maps image of the Boat Basin in Charleston, Oregon (43°20'45.5"N 124°19'24.6"W). The blue oval represents the collection location of the nudibranchs, the yellow oval represents the release location, and the green oval represents the location of the Shanks light trap on F dock where the crabs and some *Hermissenda crassicornis* were collected. Google Maps (n.d) [Boat Basin Road, Oregon 97420] Retrieved January 20, 2022, from https://www.google.com/maps/place/Boat+Basin+Rd,+Oregon+97420/@43.3440301,-124.3296136,17z/data=!3m1!4b1!4m5!3m4!1s0x54c382312fa9a005:0xbc04d6ebdd655934!8m2!3d43.3440262!4d-124.3274249

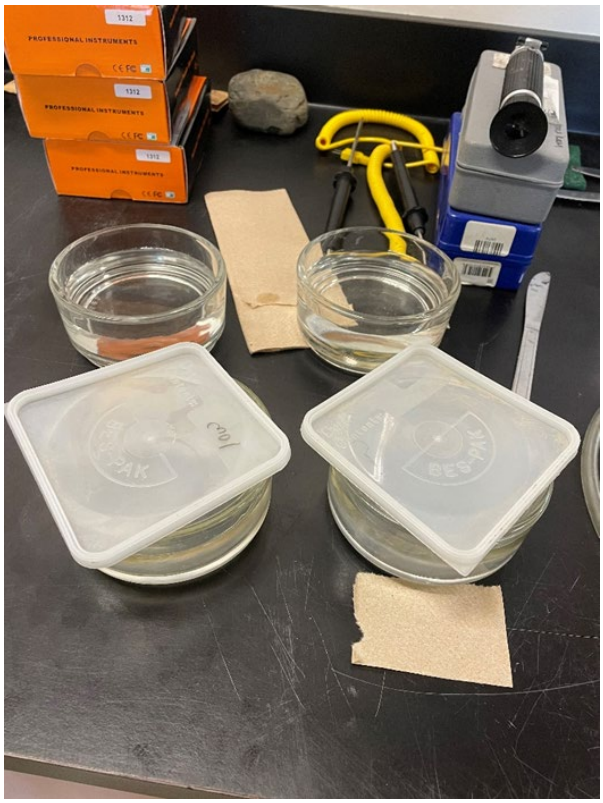

Figure 6: Image of experimental set up for *Peltodoris nobilis.* The nudibranchs are in the covered glass containers, and the brown paper marks the anesthetized nudibranch. The glass containers behind the covered containers were used for the data collection. The *Hermissenda crassicornis* experimental set up looked the same, except the containers were not covered and the glass containers used for data collection were smaller. The knife was used to move the crabs to and from the containers.

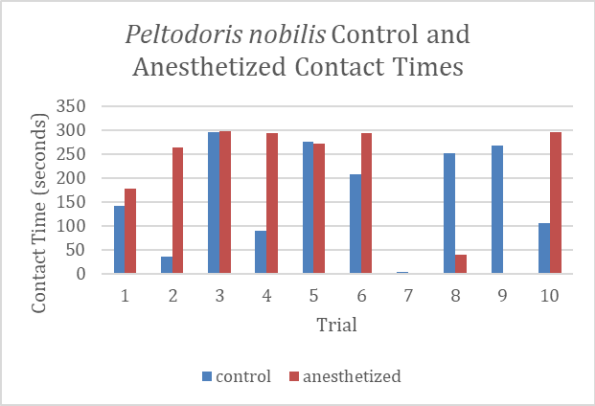

Figure 7: *Peltodoris nobilis* control and anesthetized contact times. The amount of time the crabs contacted the control and anesthetized nudibranch in each *Peltodoris nobilis* trial.

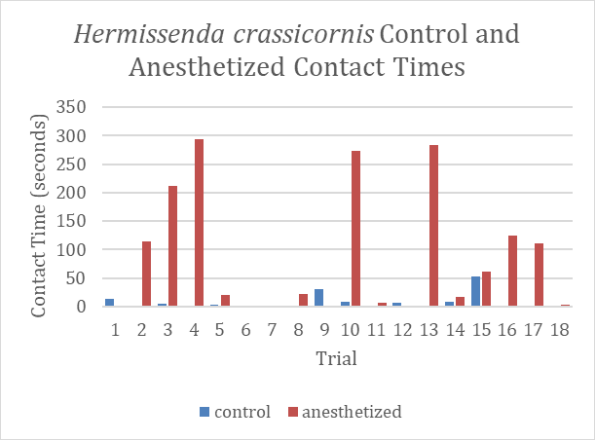

Figure 8: *Hermissenda crassicornis* Control and Anesthetized Contact Times. The amount of time the crabs contacted the control and anesthetized nudibranchs in each *Hermissenda crassicornis* trial.

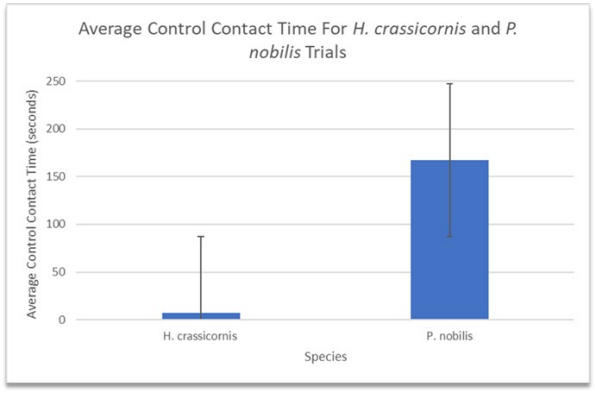

Figure 9: Average Difference in Control Contact Time for *H. crassicornis* and *P. nobilis* Trials. The average (SE) difference in the control contact times with the crabs *for Hermissenda crassicornis* and *Peltodoris nobilis* trials. *Peltodoris nobilis* had a significantly higher contact time between the control nudibranchs and the crab than *H. crassicornis*.

9. TABLES

Table 1. A table listing the behavior of the crabs when in contact with the nudibranchs. "Nudi" is short for nudibranch.

	Crab 1	**Crab 2**	**Crab 3**	**Crab 4**	**Crab 5**
Control Observations	Crab hiding under nudi, no predatory behavior, nudi releasing mucus	Crab hiding under nudi, no predatory behavior	Nudi not avoiding contact, no predatory behavior	Visibly releasing mucus, crab avoided contact w nudi, moving to the opposite side of dish, no predatory behavior	Crab hiding back legs under nudi, no predatory behavior
Anesthetized Observations	Crab on top of upside down nudi, no predatory behavior	Crab on top of nudi, some predatory behavior	Crab back legs under nudi, no predatory behavior	Nudi released mucus before trial, no predatory behavior	Crab on top on nudi, no predatory behavior
	Crab 6	**Crab 7**	**Crab 8**	**Crab 9**	**Crab 10**
Control Observations	Crab hiding back legs under nudi, no predatory behavior	Crab avoided nudi	Crab hiding under nudi, no predatory behavior	Crab hiding under nudi, no predatory behavior	Crab hiding under nudi, no predatory behavior
Anesthetized Observations	Crab on top of nudi, no predatory behavior	Crab ignored nudi	Crab on top of nudi, some predatory behavior	Crab avoided contact	Crab on top of nudi, some predatory behavior

Table 2. A table listing the statistics for a one-way ANOVA comparing the contact times with the crab between the control and anesthetized *Peltodoris nobilis* and a one-way ANOVA comparing the lengths of the control and anesthetized nudibranchs in the experiment. Also, the statistics for the one-sample t-tests comparing the sizes of the control *P. nobilis*, the sizes of the anesthetized *P. nobilis*, and the carapace length of crabs used in the trials are included.

	Control vs Anesthetized Contact Time	**Crab Carapace Length**	**Anesthetized Nudibranch Length**	**Control Nudibranch Length**	**Control vs Anesthetized Nudibranch Length**
Type of Test	One-way ANOVA	One-sample t-test	One-sample t-test	One-sample t-test	One-way ANOVA
p- value	0.63	0.50	0.50	0.50	0.72
Standard Deviation	N/A	3.59 mm	1.84 cm	1.98 cm	N/A
Mean	N/A	10.3 mm	7.24 cm	7.55 cm	N/A
t	N/A	0	-0.017	0	N/A
F	0.23	N/A	N/A	N/A	0.13
Degrees of Freedom	19	9	9	9	19

Table 3. Raw data for the *Peltodoris nobilis* trials.

	Crab 1	**Crab 2**	**Crab 3**	**Crab 4**	**Crab 5**	**Crab 6**	**Crab 7**	**Crab 8**	**Crab 9**	**Crab 10**	**Mean**
Control Contact Time (seconds)	141	35	295	89	276	208	4	252	268	106	**167**
Anesthetized Contact Time (seconds)	177	263	297	294	271	293	1	40	0	296	**193**

Table 4. Observations of crab and nudibranch behavior during *Hermissenda crassicornis* trials.

	Crab 1	Crab 2	Crab 3	Crab 4	Crab 5	Crab 6	Crab 7	Crab 8	Crab 9
Control Observations	Nudi initiated contact	Crab ignored nudi	crab mostly ignored nudi	Crab actively avoiding nudi while nudi moving towards crab	Nudi initiated contact, touched crab w front antennae than both went to opposite sides and stayed there	Nudi and crab avoiding e/o	Nudi clung to surface of water out of crab's reach	Crab actively avoiding nudi when it got close	Predatory behavior when in contact, nudi moving to avoid crab
Anesthetized Observations	Crab ignored nudi	Predatory behavior when in contact	Predatory behavior when in contact	Predatory behavior when in contact	Crab stayed on opposite side of container as nudi	Crab ignored nudi	Crab ignored nudi	Predatory behavior when in contact	Crab mostly trying to escape, ignored nudi
	Crab 10	**Crab 11**	**Crab 12**	**Crab 13**	**Crab 14**	**Crab 15**	**Crab 16**	**Crab 17**	**Crab 18**
Control Observations	Crab and nudi mostly avoided e/o	Crab ignored nudi	Nudi looks unhealthy, crab mostly ignored nudi	Crab and nudi avoided e/o	Tendrils separated from nudi still moving, mostly avoided contact	Predatory behavior when in contact, nudi moving to avoid crab	Crab and nudi ignored e/o	Crab and nudi ignored e/o	Crab and nudi ignored e/o
Anesthetized Observations	Predatory behavior when in contact	Crab ignored nudi	Crab ignored nudi	Predatory behavior when in contact	Crab ignored nudi	Predatory behavior when in contact	Predatory behavior when in contact	Predatory behavior when in contact	Crab mostly ignored nudi

Table 5. P-values for *Hermissenda crassicornis* trials.

	Control vs Anesthetized Contact Time	Crab Carapace Length	Anesthetized Nudibranch Length	Control Nudibranch Length	Control vs Anesthetized Nudibranch Length
Type of Test	One-way ANOVA	One-sample t-test	One-sample t-test	One-sample t-test	One-way ANOVA
p- value	0.004	0.50	0.50	0.50	0.57
Standard Deviation	N/A	3.55 mm	0.70 cm	0.90 cm	N/A
Mean	N/A	9.66 mm	2.11 cm	2.26 cm	N/A
t	N/A	0.007	0.006	0.031	N/A
F	9.37	N/A	N/A	N/A	0.32
Degrees of Freedom	35	17	17	17	35

Table 6: Raw data for the *Hermissenda crassicornis* trials.

	Crab 1	Crab 2	Crab 3	Crab 4	Crab 5	Crab 6	Crab 7	Crab 8	Crab 9	Mean
Control Contact Time (seconds)	13	0	5	1	3	0	0	0	31	--
Anesthetized Contact Time (seconds)	1	115	212	294	20	0	0	22	2	--
	Crab 10	**Crab 11**	**Crab 12**	**Crab 13**	**Crab 14**	**Crab 15**	**Crab 16**	**Crab 17**	**Crab 18**	
Control Contact Time (seconds)	8	0	7	1	8	53	0	0	0	7
Anesthetized Contact Time (seconds)	273	7	0	284	17	62	124	111	4	86

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Queering the Way: Investigating the Relationship Between LGBT+ Advocacy and Policy Advancement

Matthew Hampton* (Planning, Public Policy, and Management)

ABSTRACT

The modern LGBT+ rights movement in the United States has pushed both political and social advancements forward since the mid-twentieth century, furthering the fight for equality. Even as hundreds of anti-LGBT+ bills have been proposed and passed in states across the country throughout the last decade or so, they have remained a force to be reckoned with. This study analyzes the specific tactics used by LGBT+ activists and nonprofits from the mid-twentieth century to present day, through the framework of Douglas McAdam's Political Opportunity Theory to explain how campaigns or movements are made successful. Political Opportunity Theory, or Political Opportunity Structure, argues social movement success is most dependent on the availability of political opportunities (McAdam, 2013). The study primarily draws on interviews of LGBT+ activists and aligned policy makers, both archived and original, ultimately seeking to determine which advocacy strategies most effectively advance political and social acceptance. Using political theories, previous scholarly literature, and activist interviews, this study found that many factors contribute to the overall success of an advocacy campaign: access to resources, ability to mobilize populations, clear goals and strategy, and strong relationships between outsider activists and political insiders. The goal of this report is to advise the creation of effective policy change inside political arenas and social change both through advocacy and through increased LGBT+ support from powerholders in government, to further promote LGBT+ equality and understanding in the United States.

1. INTRODUCTION

You are composed of many different pieces, each of which has been collected and assembled to create something whole and one. These pieces can be otherwise known as identity, which is one's understanding and expression of themselves. Throughout American society historically and presently, sexuality and gender identity have remained as significant parts of a person's identity, for better or for worse. The idea that society has been built for specific identities is gaining ground—see the work of Roy L. Brooks on Critical Race Theory—making clear that identity-based marginalization has been a problem that has existed in society all along. This understanding explains why those with pieces of identity that do not fit into the values of their society generally face social and political hardship. For gender and sexual minorities, represented by the label of LGBT+ Americans, even trying to exist openly as oneself can be considered a political act. The ability for these minorities to live freely has only come about through means of political and legal activism, including resistance to conservative attacks on

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LGBT+ civil freedoms and fundamental rights. This fight continues to rage on today, affecting millions across the country.

The subsequent problems caused by this lack of equality spans across every different sector of life and are both created and solved primarily through two modes: legislatures and judiciaries. In 2022 alone, there have been close to 250 anti-LGBT+ bills introduced across nearly every state, most of them targeting trans people (Equality Federation 2022). In some states, legislatures have barred doctors from providing appropriate hormone treatment to trans youth who need it to minimize their gender dysphoria (the discomfort one feels when their assigned sex at birth does not align with their gender identity) before puberty makes irreparable changes to their bodies ("Doctors Who Provide..." 2022). Numerous states have introduced, and Florida has passed, bills that impose restrictions on teachers who may wish to discuss LGBT+ people or topics in their classrooms (Franklin 2022). While the language of the Florida law stops short of outright banning discussion of LGBT+ topics, it only allows discussion that is "age appropriate." This is deliberately vague, meant to cause conflict between educators and parents over what exactly is "age appropriate" with respect to LGBT+ topics and history. The reality for LGBT+ people, including children and youth, is that their civil rights are under constant attack for no reason other than their identity. Bills and laws like this one are especially hurtful because they effectively erase LGBT+ people and topics from the classroom and capitalizes on LGBT+ stigma to solidify gender identity and sexual orientation a morality issue.

Another current example of legislatures attacking LGBT+ civil liberties is the response to transgender people in athletics. Lia Thomas is a collegiate swimmer and trans woman, who, despite breaking records in her sport, faced backlash and calls to disqualify her from the sport all together because of her gender identity (Sanchez 2022). The struggle over trans inclusion in athletics has become a political hot topic fueled by transphobic rhetoric. Legislation has popped up in states across the country to make this inequity more apparent than it already is, by denying transgender individuals the ability to participate in school athletics.

Another primary mode for the development or denial of LGBT+ rights is seen through the judiciary system. For decades activists have brought cases to all levels of the judiciary, with successes gradually building in scale. For a recent example, the landmark Supreme Court Decision *Bostock v. Clayton County* (2020) was a consolidation of three cases of LGBT+ employment discrimination. Gerald Bostock was fired from his job after expressing interest in a gay softball league while working in Clayton County; Donald Zarda was fired from his job as a skydiving instructor after telling a co-worker that he was gay; and Aimee Stephens was fired from her job at a funeral home after she began transitioning her gender. In each of these cases, the Supreme Court ruled that this discrimination was unconstitutional, but it was only after these three experienced attacks on their selves and their livelihoods that this change was made. It is also worth noting that affirmation of rights by the Supreme Court, and the positive outcomes of these cases, was never guaranteed, highlighting the significance of these pivotal political moments.

This case represents a certain culmination of the transgenerational fight for LGBT+ protections in this country. Since the mid-twentieth century, there has been an increase both in the amount of LGBT+ activists, activism-based nonprofits, and LGBT+ policy makers at both the state and federal levels. The mobilization of LGBT+ activist groups in the 1960s spurred the development of the political identity as it is known today and put these issues on the radar. Much of the political theory used in this study was born during this period following the Civil Rights Movement through the end of the twentieth century, where LGBT+

activists began applying theory to their own experience. However, it was not until legislatures and courts took on these issues that political change could occur.

What confounds recent anti-LGBT+ political action is that social support and acceptance for LGBT+ people in the United States is higher today than in decades past: between 2001 and 2019, Gallup reports a 34 percent increase in the number of Americans who believe that gay or lesbian relationships are acceptable (Naylor 2021, xvii). On the campaign side, more outwardly identifying LGBT+ people are running and being elected into office than ever before, with approximately 700 LGBT+ elected officials across all levels of government in 2019 (xviii). Social progress acts as a driver for political progress, with acceptance opening the way for increased policy makers and public administrators that won't stand for inequality.

Despite the relatively high number of LGBT+ policy makers in elected office and activism being more visible now than ever thanks to social media, there are still political and social battles taking place throughout the country. The federal Equality Act, which would add sexual orientation and gender identity to the protected classes under the Civil Rights Act of 1964, continues to be stonewalled in Congress. Discrimination takes on social and political forms when laws are passed in states which codify inequitable treatment of LGBT+ Americans.

It is widely believed that activism is what forces political leaders and the public to pay attention to injustice or unfairness. In one instance, the modern American LGBT+ rights movement began with the Mattachine Society in the 1950s and rapidly expanded following the Stonewall Inn Riots in 1969 (Valelly 2012). There have been several phases of the modern LGBT+ rights movement in the United States, each of which were reacted to in a different way by state and local governments across the country.

Is this backslide simply a result of activist tactics not working, or are there other factors at play? What are some options and strategies that queer (especially trans) advocates have to combat this backlash, and how have they worked in the past? How can their success be replicated from one policy goal to another within the LGBT+ rights movement? Ultimately, this study aims to find how public administrators connect with activists (and vice versa) and which tactics have been most effective at creating social change while minimizing backlash. This will include hearing from both the "insider" public administrators and the "outsider" activists, as well as the bridges between them. Through interviews with queer political and social advocates who have all done valuable work in the fight for LGBT+ freedoms, this study posits how well the modern LGBT+ rights movement can be explained by Douglas McAdam's Political Opportunity Theory.

2. LITERATURE REVIEW

This study will use several social and political theories as a baseline for the research to answer these questions about LGBT+ advocacy and policy advancement. This literature review section provides an overview of those theories and connects them to certain aspects of LGBT+ advocacy. The review focuses on social theories of political progress and advocacy networks, rather than other models (such as economic theories of social progress).

2.1. POLITICAL AND LEGAL OPPORTUNITY STRUCTURES

This study will operate primarily under the Political Opportunity Theory, or Structure. This theory combines three factors to explain the lifespans of most political movements, those being: "expanding political opportunities, established organizations, and the social psychological process of 'cognitive liberation'" (McAdam 2013, p. 51).

Expanding political opportunities is generally understood to be done through, "dramatic events and/or cumulative change processes that render established regimes more vulnerable or receptive to challenge" (p. 51). These could be represented by a particular episode, like a protest that gains extensive media coverage, or a result of a long-standing advocacy campaign––like a law being passed or a court decision. Some events that could be considered political opportunities in the LGBT+ rights movement include: the Stonewall Riots in 1969, the AIDS epidemic, and the first litigation efforts mounted by victims of discrimination (such as those affected regarding marriage or employment). AIDS activists in the 1980s and beyond fought for healthcare and family rights. Those early cases brought by activists (partially in response to the AIDS Epidemic) ultimately paved the way for the passage of employment protections and marriage equality years later. The pressure placed on political institutions by these efforts has historically created political opportunities for change, as they demonstrate that the people are standing against what systems are already in place. In this way, political opportunities, while seemingly random, can be created by activists, organizations, and advocacy efforts done at all levels, leading to the second factor McAdam discusses.

Next, McAdam "focuses on the extent to which 'insurgents' have access to the kinds of existing organizations or informal networks thought to serve at the organizational locus of emergent mobilization" (McAdam 2013, p. 51). Connecting individuals that have the drive and determination to push for political change is a crucial step in seizing a political opportunity––especially when said individuals have the resources necessary to properly promote and encourage change. This might mean a plaintiff in a discrimination case connecting with a nonprofit that will represent them in court, or an activist collaborating with local organizations or other groups where they can spread their objectives and gather support. Along with seizing political opportunities as they arise, connecting those in command with the networks and resources needed to make something happen offers a deep potential for political change.

However, according to McAdam, a third factor is necessary to truly grasp a political opportunity: "the process of 'cognitive liberation' by which some critical mass of people come to define their situations as unjust and subject to change through group action" (McAdam 2013, p. 51). A movement does not become a movement until enough people become a part of it. Political institutions in the United States can be enormous and still slow-moving; it takes a village to raise a policy change. Gaining name recognition for the issue, increasing social visibility, and mobilizing identity-based groups to fight for certain goals collectively is how political opportunities are taken advantage of. Political scientist Rick Valelly explains that the number of activist organizations focused on LGBT+ social and political progress increased dramatically following the Stonewall Riots in 1969 (Valelly 2012) which spurred further visibility as pride protests became annual events across the country. It was at these protests that activists further mobilized queer people and their allies, encouraging people to come out and band together under a common name.

It is important to note that in most parts of the United States, a large amount of LGBT+ civil liberties have been secured through courts, not legislatures. As touched on previously, many pieces of legislation with the aim to protect or expand on LGBT+ civil liberties were not passed. For example, the legalization of same-sex marriage was achieved through litigation (Lau 2018, p. 27), as was federal employment discrimination protections (Bostock 2020).

Political theorist Ellen Anderson has built off of the general Political Opportunity Structure in her work, framing it specifically in the judicial arena to flesh out an adjacent theory: Legal Opportunity Structure. This structure has similar dimensions

to the original, but with the added condition that someone must frame their political goal within a judiciable question. Political goals must fall within categories the court already recognizes as law to be achievable in this method; constitutional, statutory, administrative, common, case, or any combination of them (Anderson 2004, p. 9).

These theories can be exemplified by the beginnings of the marriage equality movement in Hawaii in 1993. Evan Wolfson, an attorney who convinced Lambda Legal, one of the oldest organizations which advocates for LGBT+ equality primarily through litigation, to support the case, recalls that a recent change in the makeup of the court was what allowed the case to be heard (Gash 2015). This was a significant decision that only appeared because a legal opportunity presented itself amidst activism. This represented a trend of LGBT+ support in a group that had previously seen LGBT+ people demanding rights and liberties. In this case, the Hawaii court did not end up legalizing same-sex marriage (Gash 2015) but because the case was brought out in public, the fight for marriage equality was now out of the bag, opening it up to be a policy goal.

However, the activists behind social and political movements more broadly do not have full control over political institutions and the decisions they make. Often political opportunities are not successful even when the advocacy is wide-reaching and strong because of external factors. Legislatures, executive departments, and judicial institutions do not always respond to the pressure placed on them by advocates. Many scholars have explored this phenomenon, and I borrow from their frames of thinking throughout this paper to examine what strategies of advocacy lead to successful policy outcomes (legislative or judicial).

2.2. LGBT+ SOCIAL EQUITY WITHIN PUBLIC ADMINISTRATION

In the public policy field, LGBT+ rights are generally considered a civil rights issue. According to Professor Lorenda A. Naylor from the University of Baltimore, social equity should be a responsibility of public administrators, and it has to be institutionalized through various professional organizations outside of government (Naylor 2021, p. 6-9). In her view, the rule of law is a cornerstone of social equity, and it has been practiced by policy makers through federal law (such as the Civil Rights Act of 1964) and court decisions (such as *Bostock v. Clayton County).*

Naylor writes that the reason legal rights for LGBT+ people "lag behind" in their rights compared to others is because sexual orientation and gender identity were not considered "protected classes" in discrimination lawsuits, which may explain why it took the Supreme Court until 2003 to affirm a civil protection for queer people. Despite this, the majority of LGBT+ progress at the federal level has been driven by the courts, rather than legislators (Lau 2018, p. 25). This would suggest that litigation is a primary way that activist citizens and groups can directly engage the government, but, like the marriage equality case in Hawaii, the makeup of the judges needed to have a willingness to consider these rights existed.

Where did this willingness come from? It has to do with the increasing social acceptance of LGBT+ people, no doubt driven by activist work. Political progress can often times be driven by social progress, both of which appear to be driven by activists' tactics. However, if acceptance of LGBT+ people is increasing, why the current political backlash to many of their rights across the country?

2.3. THE ROLE OF ACTIVISTS AND CULTURAL FRAMING

Professor Erin Mayo-Adam argues that grassroots activism plays a similarly important role in advancing LGBT+ social and political progress as larger nonprofit organizations, but it receives less attention than them (Mayo-Adam 2020, p. 5). Since

local movements, which encourage community involvement and bottom-up change, are harder to map than ones that take place in locations with a larger populations or reach, their impact often goes unnoticed. However, the formation of political movements remains driven by "rights episodes," what Mayo-Adam calls moments which represent a struggle for a rights win or against a rights loss.

This may explain why LGBT+ political progress appears to take place when it does: it represents the culmination of a struggle by activists to achieve a certain right or set of rights, whether in the form of legislation or court ruling. For example, regarding the quarter-century long fight for marriage equality (beginning with the first Court case in 1994 in Hawaii), activists all over the country were able to mobilize around a specific issue. By unifying the messaging and creating a specific political goal, activists were able to direct social change toward that goal until it became law. Also, by going state to state, activists were able to achieve policy wins in areas where the level of social progress was appropriate to avoid backsliding (one major exception being the state of California). In this way, smaller advocacy groups were able to band together, creating a snowball effect of progress beginning in areas where LGBT+ people were more socially accepted and moving outward.

Building on this, Public Affairs and Administration Distinguished Professor Charles Epp describes a "culture-centered" and "rights consciousness" explanation for rights revolutions. He says that cultural frames shape what claims people can conceive and what "kinds of changes that they view as within the realm of possibility" (Epp 1998, p. 17). However, Epp still acknowledges the necessity of material support in the deliberate creation of a rights episode, including financial supports for plaintiffs (p. 17). Essentially, by gaining social exposure for LGBT+ rights through publicity gained by rights litigation, activists can hit two birds with one stone. On one hand, they are opening up people's idea that LGBT+ people can have certain rights. On the other, they are directly demanding those rights from the government via the courts.

2.4. BRIDGES BETWEEN THE OUTSIDE AND THE INSIDE

Political scientist Ken Kollman studied the relationship between outside lobbyists and inside policymakers in the 1990s. He found that "politicians use grass-roots contacts as a sort of hyper-concentrated version of what people are thinking back home," (Kollman 1998, p. 155). In this way, it can be assumed that activists represent the wishes of the constituency. For example, a representative from a grassroots organization can express what a specific community thinks about an issue to their local, state, or national representative as a form of lobbying. However, there are some exceptions to this, like when activists want to put a new issue on the table that the public may not be adequately informed about, or when the contacts politicians maintain are not representative of the constituency's wishes. Kollman ultimately concludes that Interest Groups and Public Opinion are formed by each other, and only with both can policy be created (p. 157). Combined with Naylor's view that public administration is responsible for enforcing social equity, Kollman's ideas show that interest groups or nonprofits are the sort of "watch-dogs" that hold the government accountable for doing so. This also highlights the importance of nonprofits working as bridges between outside activists and inside policymakers.

However, Kollman mostly focuses on the power of special interest groups to lead policy makers away from creating policy that would solely benefit a majority of people. For instance, LGBT+ equity in policy does not inherently benefit most of the American population. In fact, some groups may say that it harms the interests of those

such as religious or hate groups. This aspect of his work may indirectly explain backlash to LGBT+ rights advancement in recent decades, since it shows how minority opinion groups can manipulate policymaking to serve their interests (like tobacco companies, for example).

Political researcher Ben Smitton found that the LGBT+ rights movement has effectively established itself within the "political spatialities" of Washington, D.C. to create "pro-equality social reform," (Smitton 2017). With the establishment of groups like the LGBT Equality Caucus in Congress, or nonprofits like the Victory Fund creating networks for activists to do work within Congress, the fusion of the LGBT+ movement into the politics of the US federal government is clear (Smitton 2017). This fusion would not be possible without the work of the LGBT+ co-chairs. Smitton's work also solidifies the role of nonprofits as bridges, literally providing fellowships and opportunities for LGBT+ professionals to push for political change inside the policy machine.

However, how these larger organizations were able to bring the fight for social and political change to the Congress is only part of the story. Individual grassroots activists and organizations still play a vital role in pushing pro-equality social and political progress to the forefront of mainstream issues. Throughout this paper, I seek to understand how these two sides–– the outside activists and the inside policymakers––connect to each other in the context of the LGBT+ rights movement.

2.5. THE CURRENT MOMENT

Examining transgender rights issues is one way to examine what the current LGBT+ movement looks like. In 2009, when Barack Obama assumed office, this issue was "largely invisible on the nation's agenda" (Mezey 2020, p. 2). However, the Obama administration became committed to advancing the "constitutional and statutory rights of the transgender community" especially with respect to employment, education, and military service (p. 2), primarily by quietly adding gender identity protections alongside sexual orientation protections.

This commitment on behalf of the Obama administration represented both a receptiveness on their part to work toward political change, and a strengthening of transgender advocacy networks. In a sense, it was a "right person, right time" circumstance. Additionally, after marriage equality became law, an opening emerged within the movement for trans rights issues to take center stage. In 2016, Donald P. Haider-Markel and Jami Taylor argued that many legislators were not "ready" for transgender issues, citing circumstances in New York and Maryland where transgender protections were removed from certain bills to advance them (Ball 2016, p. 60). They also argued that there was not much public awareness of transgender issues, and that education tactics must be implemented by activists to make political ground (p. 60).

Between 2016 and 2022 there have been a few "rights episodes" specific to transgender rights across the nation. For example, the Bostock Supreme Court decision in 2020 affirmed employment protection for transgender people, representing a rights win. In court, public administrator decisions are directly influenced by activists and advocacy-focused nonprofits. An organization with the mission of advancing LGBT+ equality may offer to represent plaintiffs in civil rights cases, where judges hear direct advocacy during oral arguments. In a way, it makes sense that LGBT+ political progress moves more quickly through the courts, as it gives activists a better opportunity to create a change. There are fewer parties to get on the same page in court than in a legislature, so an activist only needs to convince the relatively smaller number of judges on a bench than the larger number of representatives in a legislature to secure a rights win.

It is in legislatures where political progress can be slower, and where more "rights episodes" have ended in a rights loss. In 2015 alone, 15 anti-LGBT+ bills were passed into law across the states, and the trend has not slowed down since (Ronan 2021). It seems these were a direct result of political backlash against LGBT+ political progress. Support for the federal Equality Act––which would explicitly include LGBT+ citizens in the protections afforded in the Civil Rights Act of 1964––has stalled in Congress (Ronan 2021). Laws created to ban transgender children and teenagers from accessing hormone treatment or use the bathroom they identify with are becoming increasingly common across states (Ronan 2021). In Oregon, a state with strong protections for its LGBT+ citizens, a school board in the city of Newberg has banned the display of LGBT+ Pride Flags in schools for being "politically divisive" (Selsky 2021).

2.6. OTHER THEORIES AND STRATEGIES

One theory related to the development of civil rights for LGBT+ people is that of "sequential rights". This theory posits that the order that sexual orientation nondiscrimination is protected is: regulation of sexual activity, followed by employment, same-sex civil unions, marriage equality, and ending with parenting rights (Lau 2018, p. 25). This theory also highlights that gender identity nondiscrimination rights generally lag behind sexual orientation nondiscrimination rights (Lau 2018, p. 25).

While the specific ordering of these rights may not be entirely accurate, the idea that the development of some types of rights leads to the development of others (a snowball effect) seems to have some merit. For example, after the Supreme Court struck down same-sex marriage bans nationwide, some federal courts of appeal began interpreting Title VII's prohibition of sex-based employment discrimination to include sexual orientation (Lau 2018, p. 27). This theory was published prior to the Bostock decision, but it can be concluded that once federal courts began interpreting Title VII in this way, it made it easier for the Supreme Court to do the same five years later.

Another theory, incrementalism, explains rights development as happening slowly, one piece at a time. This theory observes the path of policy development for LGBT+ rights to consist mostly of "piecemeal policy changes," that change with time rather than major federal legislation (Norman-Major 2015, p. 355). These changes include the expansion of Equal Employment Opportunity Commission (EEOC) protections in 2011, the Social Security Administration recognizing both individual change of gender and same-sex marriage taxes, and military benefits for same-sex couples in 2013 (Norman-Major 2015, p. 356-359). However, "having a human rights law protecting the rights of lesbian, gay, bisexual, and transgender people…provides a base for organizing" (Swan & Swanzy-Parker 2015, p. 128). Without some sort of base to start from, activists have nothing to focus in on and push forth via their work.

In Minnesota, a 2012 state constitutional amendment to ban same-sex marriage was on the ballot. Looking at the election data, we can pick out some key strategies that contributed to the rejection of the amendment and successful defense of LGBT+ marriage rights in the state. Those strategies included: support from key officials––particularly from city governments––taking a visible role in the anti-amendment campaign; using celebrities that have access to money and visibility; and appealing to voters' faith (Bibus 2015, p. 103-105). The strategies in this case can be boiled down to allies, faith, money, and time, which is like what the political opportunity structure theory says but deviates in that it is framed in a more social context. Appealing to voters and their social values, including socioeconomic and religious demographics from

all backgrounds, helps when executing a successful political campaign, so it stands to reason it would help for an advocacy campaign to be successful as well. However, this is only possible if there is a well-organized coalition around a specific campaign issue (Swan & Swanzy-Parker 2015, p. 128).

Returning to the Smitton example, integrating advocacy with government structure and action is another strategy activists have used. One example is in Washington, D.C., where the Transgender and Gender Identity Respect Campaign became the first government-funded campaign focused exclusively on the betterment of transgender and gender non-conforming people (Jenkins 2015, p. 176). The government funding a social advocacy campaign is useful in that it expands activists' social and political reach, providing more material support to their mission to help protect thousands of lives. This is, again, more in the social frame of Political Opportunity Structure and is unique in that the political institutions are directly interacting with and often supporting advocacy efforts which put pressure on other political institutions.

A final strategy I found in my research is the creation of task forces with the purpose of supporting LGBT+ rights advancement. In 1975, after unsuccessfully lobbying the Oregon legislature to pass a law banning sexual orientation discrimination, activists instead successfully asked the governor's office to create a task force on gay civil rights (Nicola & Shepherd 2020). In doing so, activists were able to collect accurate information on homosexual men and women in Oregon, using it to make recommendations on legislation and administrative policies that promoted civil rights for LGBT+ Oregonians (Hart 1978, p. 1) all with the support of the state government. This is valuable in that it helps to break social anxieties and uncertainties, signals support from state executives to activists, and provides a roadmap for legislators to follow. Creating a task force helped to normalize queer identities, bringing them into someone more conceivable to the average citizen. From there, the collected and published data gave a rational basis to the fair treatment of queer people in Oregon. With the foundation given by the final report, activists in Oregon were able to secure rights in the following decades.

2.7. EMPLOYMENT DISCRIMINATION

Figure 1 illustrates the efforts taken by activists to create political change, and then the results of their efforts. The space between each segment of Fig. 1 represents efforts made by activists—including protests, demonstrations, and campaigns—over the course of several years at all levels of government.

1950	The Mattachine Society is established, one of the first LGBT-specific activist groups. The right to employment was a "major concern" for this activist group (Baumann, Dillion, & Dillon 2020).
1953	President Eisenhower issues Executive Order 10450, allowing LGBT+ employees to be fired with no cause (Bronski 2011).
1954	The Sisters of Bilitis is established, one of the first LGBT-specific activist groups. The right to employment was a "major concern" for this activist group (Baumann, Dillon, & Dillon 2020).
Protests where LGBT people dressed in formal attire and picketed outside office buildings began, they were to prove that gays and lesbians were employable and respectable people.	
1964	The Civil Rights Act of 1964 is passed, banning discrimination based on race, color, national origin, religion, or sex (Baumann, Dillion, & Dillon 2020).
1965	Activist activity and demonstrations increase nationwide. Activist groups begin collecting data about the state of employment discrimination in the country (Baumann, Dillion, & Dillon 2020).
1969	The Stonewall Riots in New York bring the LGBT rights movement to the public consciousness. (Baumann, Dillion, & Dillon 2020).
Following the Stonewall Riots, acts of civil disobedience and protests began to increase in conjunction with increased exposure in the press.	
1975	The first legislation prohibiting employment discrimination on the basis of sexual orientation is introduced in the House of Representatives (Bronski 2011).
1982	Wisconsin becomes the first state to prohibit discrimination in private and public employment on the basis of sexual orientation (Mooney, Knox, & Schacht 2009, p. 467).
1993	Minnesota becomes the first state to prohibit discrimination in private and public employment on the basis of both sexual orientation or gender identity (Preston 2016, p. 76).
1994	ENDA, the Employment Non-Discrimination Act, is introduced in the House of Representatives, which would have prohibited employment discrimination on the basis of sexual orientation (later versions include gender identity) (Bronski 2011).
2012	The Equal Employment Opportunity Commission rules that the Civil Rights Act of 1964 does not allow employment discrimination based on gender identity, arguing that it is a form of sex discrimination (Naylor 2021).
2015	The federal Equality Act is first introduced in both Houses, which would prohibit all discrimination on the basis of sexual orientation or gender identity (Naylor 2021).
2020	The U.S. Supreme Court rules that Title VII of the Civil Rights Act of 1964 prohibits employment discrimination on the basis of sexual orientation or gender identity (Naylor 2021).

Figure 1: Timeline of employment discrimination prohibition

3. METHODOLOGY

The goal of this study is to do a primarily qualitative analysis of insider and outsider tactics for political and social change related to the LGBT+ movement in the United States. To this end, the primary research method conducted over the course of this project was interviewing. I also

used the literature review to compile some case studies about LGBT+ campaigns in the United States throughout the past several decades.

To conduct the interviews, I contacted LGBT+ professionals who either currently work or formerly worked at a queer advocacy-focused nonprofit or in a legislative or political role at the state or federal level. The selection of interviewees was primarily a convenience sample, as I could only talk to the people who 1) responded to the request and 2) were available to be interviewed. The request contact method was primarily done via e-mail, with just three of the requests conducted over the phone. In all, fifteen interview requests were sent out over the course of the six weeks of research, and six interviews took place. Each of these interviews was between thirty minutes and one hour, and all but one of them were conducted remotely through video calls and were recorded. One interview (with Rebecca Dinwoodie) was conducted in person and was transcribed live. Afterwards, transcripts for each interview were generated from the recordings and used for analysis.

To identify potential interviewees, I researched significant LGBT+ activists and groups and compared them to theories of tactics for political change. I then looked into notable judicial cases, policies, and nonprofits related to the advancement of LGBT+ rights, studying which tactics lead to their creation and implementation. Finally, I asked my advisors for connections they had to professionals in the nonprofit and policy fields as each of them related to LGBT+ rights and activism in one way or another. This proved to be the most effective method to recruit interviewees.

The purpose of the interviews was to see what motivated each professional to participate in pushing for political change and how they have gone about doing so. In the end of this paper, I plan to compare this data with the literature review to determine how LGBT+ social progress happens, and more specifically, what role is played by outsider activists, insider policymakers, and collaboration between the two. What relationship did outside activists have with insider policymakers, and vice versa? What types of tactics did they use to create a win or fight back against a loss of rights? What do they think of the current moment regarding trans bathroom, sports, and healthcare issues, and how activists and policymakers can work together to secure those rights? This research was conducted in compliance with the University of Oregon's Institutional Review Board.

The interviews themselves were semi-structured; I developed questions based on the interviewee's own experience and made sure to leave enough space for the interviewee to give detailed and personalized answers. As this research was conducted during a time of great political uncertainty for LGBT+ people, many of the interviewees discussed work that they are currently doing at the organizations they represent. In no case was confidential information given in an interviewee's answer.

Following the interviews and content analysis based on the literature review, I broke down the themes of the data, categorizing the data by advocacy tactic, issue, and level of success (or if it's still ongoing). There is some quantitative analysis present, as I categorize successes and failures or frequencies of particular tactic, but the qualitative analysis was the primary focus.

3.1. INTERVIEWS

The professionals interviewed and their descriptions, in the order they were interviewed, are as follows:

Diego Miguel Sanchez currently works as the Director of Advocacy, Policy, and Partnerships at PFLAG National. Previously he was the Director of Public Relations and External Affairs at the AIDS Action Committee of Massachusetts and the AIDS Action Council in DC. He also served as

Congressman Barney Frank of Massachusetts' Senior Policy Advisor, becoming the first transgender senior legislative staff member on Capitol Hill.

Vivian Topping is the Director of Advocacy and Civic Engagement at Equality Federation. She has done extensive work in campaigns all across the country including, Freedom for All Massachusetts, Competitive Arizona, Florida Competes, For Florida's Future, Freedom Michigan, and serving as a Texas field organizer at Human Rights Campaign.

Evan Wolfson J.D. is currently the Director of Freedom to Marry Global; he founded Freedom to Marry in 2001, continuing to lead the organization through 2016. Freedom to Marry was a nonprofit with the mission to secure marriage equality in the United States, and it was formally ended upon meeting this goal. Freedom to Marry Global strives to support national movements for marriage equality in countries all around the world.

Brian K. Bond is the Executive Director at PFLAG National and Straight for Equality. He also served as the executive director at the Gay & Lesbian Victory Fund from 1997 through 2003. Beyond his nonprofit leadership, he worked in politics as the Deputy Director at the White House Office of Public Liaison during President Obama's first term, and as the Director of LGBT Outreach at the Democratic National Convention in the mid-1990s.

Rebecca Dinwoodie is the co-director at the Wayne Morse Center for Law and Politics at the University of Oregon. Before taking on this role, she volunteered and worked at Basic Rights Oregon, a nonprofit that helped to pass LGBT+ rights legislation in the state––including protections for marriage equality, family rights, and employment discrimination prohibition.

Candace Gingrich worked as the Associate Director of Youth & Campus Engagement and Internship Coordinator at Human Rights Campaign for over two decades. They are also well known as Newt Gingrich's half-sibling, who is a Republican politician who oversaw the passage of the Defense of Marriage Act which made it legal to deny same-sex couples marriage rights. Candace Gingrich is now retired and remains a public figure in the LGBT+ rights movement in the United States.

4. FINDINGS

I began each of the interviews by asking for a general overview of the interviewee's career with advocacy and/or policy, then dug into specific campaigns or activities they engaged with along the way. Once each interview was concluded and transcribed, I compared each interview to find patterns or similar answers/experiences. In doing so, I organized these patterns into categories, which I will use to help synthesize my findings. Additionally, I will be viewing these findings through the lens of Political Opportunity Theory and Legal Opportunity Theory as they apply.

The categories I created were (listed in no particular order):

- Necessary Resources
    - Insider and Outsider Relationships
- Successful Advocacy Activities
    - The Power of Stories
    - Public Education
- Strategy in Movements and Campaigns
- Current and Future Fights
    - Democracy

There may be some overlap within these categories (sharing stories could be viewed as a successful advocacy activity, for example), so specific ideas or concepts that arose repeatedly may appear in multiple categories if applicable.

4.1. NECESSARY RESOURCES

The crux of McAdam's and Anderson's respective Political Opportunity Structure and Legal Opportunity Structure theories is that certain conditions need to be met for a political or legal opportunity to arise. Once that happens, insurgents or activists need to have resources or support in order to seize those opportunities. Since all of the interviewees in this study had experience working on advocacy campaigns for LGBT+ rights, they knew what types of resources were needed in order to make a campaign successful.

Firstly, it is important to define what distinguishes a campaign from a movement. In discussions about advocacy and social organizing, terminology is often misused when there are clear differences between social advocacy structures; a campaign is not a movement, but sometimes campaigns are attributed as such and vice versa. I find that a campaign has a singular goal (like passing a specific policy or getting a certain court ruling), and a movement is a broader coalition of campaigns that are all related to each other in some way.

Within the interviews I conducted, most of the answers given when asked the question "What were some of your greatest advocacy/ policy successes and what made them successful?" centered around specific campaigns (either local, state, or federal). Based on these answers and the literature in this study, I find that the necessary resources for a successful LGBT advocacy campaign are time, money, labor, allies, unity, and a democratic environment.

One of the more concrete illustrations of necessary campaign resources was given by Vivian Topping, who worked on several LGBT+ advocacy campaigns across the nation. One of them she directly impacted, the Massachusetts Gender Identity Anti-Discrimination Initiative was a state-wide ballot referendum in Massachusetts in the 2018 mid-term election. It sought to defend the trans-inclusive language in the state's anti-discrimination statute from a veto by public referendum. Topping worked on the Yes on 3 Campaign, which encouraged voters to support this ballot initiative; it ended up passing, preserving transgender rights in the state. In our conversation, Topping identified what resources the campaign had and why they contributed to its success.

She said, "We had a lot of time. Unlike most other campaigns, we had a significant amount of lead–up to this." According to Topping, time proved essential in ensuring that a strategy could be developed, that adequate resources could be organized, and that the messaging of the campaign would not be rushed. Additionally, although campaigns tend to have a prescribed end-date (for example, an election night), a negative outcome of that "rights episode" or "political opportunity" might force a campaign to continue fighting a long game. Evan Wolfson, founder of Freedom to Marry, said of campaigns: "Nothing's gonna happen overnight." Brian Bond, the Executive Director of PFLAG, echoed this sentiment: "Some people think things can happen overnight…there's multiple priorities going on at the same time."

The next resource, money, is relatively straightforward: if you do not have enough money to pay to get an initiative on the ballot, play an advertisement on TV, or send letters to voters about your campaign, it likely will not succeed. Topping said that Yes on 3 was "able to raise significantly more money than [their opposition]." She added that they, "also were able to control the narrative, in the press," showing that money provides access to greater visibility for a campaign and its messaging. So when one side has more money than another, they have a significant advantage at achieving their goal. Topping later mentioned that because of her campaign's strong fundraising, their opposition struggled to gain ground, but "if they had had just enough money to go on TV, I think that the difference would've been pretty significant."

Similarly, Candace Gingrich, who worked at the Human Rights Campaign for over twenty years, mentioned the importance of gaining visibility—not only for the cause, but for LGBT+ people in general. They said when they first started at the Human Rights Campaign, they embarked on a town hall tour spanning 52 cities across the country. While this tour was firstly a fundraising tactic, they said it doubled as a series of "friend-raising" events in "places like Greenville, South Carolina and like Boise, Idaho." Coupled with standard media such as television, radio, and print, they said that it was "that exposure, that visibility, that representation…[that] made a difference," in getting people organized and connected to the Human Rights Campaign in both urban and rural areas.

Another basic resource is labor. Without adequate labor, your campaign may not have a large enough reach to be successful. When discussing her experience organizing campaigns, Topping reflected, "Do you have enough actual people — people who are able to do this work on the ground, who are able to focus on this? If you don't…then you're not gonna win." Advocacy activities cannot be done without labor, and these findings align with Bibus's writings on the 2012 Minnesota ballot measure election campaigns, which discuss the importance of canvassing and developing materials for media in getting a campaign's message out. Bibus wrote that Minnesotans United, a pro-LGBT+ campaign, had over 27,000 volunteers statewide by the campaign's conclusion, and this strength in numbers is what allowed the campaign to call 900,000 people and reach 400,000 in person to support their cause (Bibus 2015, p. 106). Campaigning is a job and without adequate labor, a campaign will not succeed.

Beyond these three basic needs, there was also talk of creating and maintaining ally coalitions to reach success. Diego Sanchez, who is the Director of Advocacy, Policy, & Partnerships at PFLAG National, spoke highly of the need to work alongside other organizations to broaden your scope and make your messaging more appealing. He said that once you have a core of advocates, you should reach for support from communities outside your own giving the faith and business communities as examples.

Rebecca Dinwoodie, who worked at Basic Rights Oregon, also spoke to the significance of the business and faith communities as allies. She said that in Basic Rights Oregon's work to help pass the Oregon Equality Act and the Oregon Family Fairness Act, they wrote letters to the editor for newspapers in towns that had swing votes ang engaged in media campaigns with allied communities. In her example, she said they had "media campaigns with loggers, republicans, [and] farmers, advocating on TV and other places for these bills," that would enshrine LGBT+ equality into state law.

Vivian Topping also cited having broad coalitions of organizations as contributing to the success of Yes on 3. She said that their broad coalition included groups ranging from sexual assault advocacy organizations to law enforcement agencies and from individual community leaders to businesses. The fact that all these organizations were saying "'vote yes,' all at the same time," is what Topping cites as a key component of the campaign that led to its success.

Candace Gingrich agreed with the importance of coalition building. When discussing the current struggle to pass the federal Equality Act, they said that many groups, including the Human Rights Campaign, the National LGBTQ Task Force, GLAAD, the Leadership Conference on Civil Rights, and the Antifa League are all talking about it. Most of these examples are LGBT+-specific organizations, but some are engaging in other advocacy work. Gingrich highlighted the strength in numbers that comes from having allies for the purposes of advancing policy, and they also spoke

about their experience with the Coming Out Project. They said the project, "started with people who were allies coming out as allies. And then, celebrities were able to…come out and be part of it." Allyship helped pave the way for political progress, which required strong coalition building.

Gingrich also said that, regarding the Employment Non-Discrimination Act, their main partner was The Workplace Project––a nonprofit related to equality in the workplace. This partnership started the corporate equality index, leading to corporate America gradually becoming publicly supportive of the legislation. Gingrich said that, "The companies could say, 'It's good business here to treat people fairly and equally.'" So coalition building can bridge between the non-profit and the public sectors, in addition to the private sector. These answers are reinforced by Anderson's theoretical condition that the availability of allies is one factor that determines the success of a political and/or legal opportunity (Anderson 2004, p. 9), but come short of explaining another intrinsic quality of a successful campaign.

Another dimension to allyship is unity or incorporating allied organizations into a campaign or movement where they all act in synergy with each other. This idea of all similar organizations being on the same page in a campaign and working together to meet the goal is crucial when growing a campaign, broadcasting messaging, and incorporating allies into a campaign. Sanchez, who coordinates the national PFLAG organization, works on "helping our local chapters work in coalitions," or unifying to tackle bigger problems rather than fighting alone. Unity can be internal in large organizations, like this PFLAG example, or represent many different stakeholders coming together on a single campaign, like the following example.

Topping says that another factor that contributed to Yes on 3's success was that the "opposition was really split, so their campaign wasn't as unified as ours was." Being able to build a campaign and maintain unity is difficult, but it is crucial in making sure no efforts are wasted. Additionally, unifying can allow an organization to tap into more resources. For example, Dinwoodie discussed how Basic Rights Oregon focused their organizing on more rural areas of the state, bringing people from all over to the capital for lobby days. By unifying people from underrepresented areas across the state, it granted more people the opportunity to join the campaign. This unification process is similar to what McAdam described in his second factor of political opportunities, where activists must connect to existing resource structures to seize an opportunity to enact political change (McAdam 2013, p. 51).

To finish off the list of necessary resources is one that is perhaps most taken for granted in the United States: a democratic environment. Wolfson said that a "charter of legal rights, guarantees and freedoms," like the U.S. Constitution, "can be used to pressure and push the government to do things." He also named the independent judiciary, the guarantee of a free press, the right to protest and to organize as all necessary to practice advocacy activities or a campaign at all. Without the right to advocate for one's beliefs guaranteed in the U.S. Constitution, none of this work would be possible.

4.2 INSIDER AND OUTSIDER RELATIONSHIPS

Brian Bond spoke about the relationship between those inside political institutions (insiders) and those outside them (outsiders). He argued that both outsiders and insiders need to have the same goal in mind, but that outsiders need to understand the limitations that insiders have placed on them. Bond's answers strengthen the conclusions that Kollman made in his writing, that the two tracks inform each other: the outsiders

hold the insiders accountable, and the insiders listen to the needs of the outsiders, as does his work experience in both government and nonprofits.

In the mid-1990s, Bond was made the Director of LGBT Outreach for the Democratic National Committee, working with party leaders to carve out a space for LGBT people in policy. He said that, "from the inside perspective, it was getting both the DNC and then President Clinton and his team to be more inclusive, both on policy, but also in words," such as getting politicians to say the words "gay," "lesbian," and so on. Pressure from advocates led the DNC to create this specific position, and it was through that position that Bond was able to essentially campaign on the inside for LGBT+ inclusion and equality. Being included in conversations about how much money was being spent on "get out the vote" campaigns across the country helped Bond to promote LGBT+ equality as a financial interest to the party.

Just as outsiders need to build a coalition of allies to create success, so do insiders. Based on his experience working in advocacy, Bond argued that all activists ultimately have two main goals. These are: "to put pressure on the government to create a need for change … [but also] to figure out how to build a mechanism of trust with the decision makers." This was the point he hit on the most during our conversation: the trust between inside and outside actors. He said it was necessary for there to be synergy between advocates and people on the inside because there are people on the inside advocating too.

For Bond, the major inside ally for LGBT+ rights during his time of working for the party was former President Barack Obama. However, Bond made clear that government employees serve their bosses, which could be a president or a governor, and their allegiance must be to their boss first, so advocacy goals might not be reached right away or at all. He noted that "when you work for the President of the United States…your loyalty is to that individual…and it works if you actually believe that individual is going to get shit done." Building allies inside political institutions, especially ones with a high level of political power or influence, is another critical piece of the political progress, though as Bond said: "trust is crucial in an advocacy space, but it's hard."

To summarize Bond's testimony, a level of trust among outsiders and outsiders, insiders and insiders, and between outsiders and insiders, seems to be necessary to move social change together. This also makes logical sense; no policy can be moved by one person alone, the outside cannot pass policy alone, and the inside cannot pass policy the outside wants without advocacy efforts. This finding corroborates Kollman's conclusions about nonprofit and activist tactics — that political change needs both people inside and outside to move it, and that outsiders push insiders to make changes. However, Bond qualified this idea with the precondition that trust between the two sides also needs to exist.

Bond emphasized that this trust is difficult to cultivate, "especially when it's, you know, you. Part of it's coming from your heart, part of it's coming from your experiences." Being a member of the LGBT+ community is an important part of people's identities, so it can be difficult to place trust in strangers that occupy spaces in political institutions that have either ignored or condemned their identity for decades. However, to create change, one must trust that the political opportunity is present both on the inside and the outside.

4.3. SUCCESSFUL ADVOCACY ACTIVITIES

The main portions of these conversations with advocacy leaders were discussions on what made their past work successful. These discussions delivered upon two different, main ideas: what they had, and what they did. The types of advocacy activities that contributed to the success of their campaigns can be broken down into seven groups:

using personal narratives and stories, mobilizing voters and campaign volunteers, publicizing the campaign's message, creating public education campaigns, developing robust resource distribution networks among advocacy organizations, engaging in civil disobedience, and taking part in drafting the policy itself.

4.4. THE POWER OF STORIES

Telling the stories of LGBT+ individuals was the concept brought up most by each of the interviewees, and it makes sense why. Charles Epp discussed how culture can inform policymakers when coupled with solid material support (Epp 1998, p. 17), and storytelling is a powerful tool to create cultural impact. When combined with McAdam's concept of connecting people to resources that help them create change (McAdam 2013, p. 151) this seems to explain why each interviewer brought up constituent stories in their answers. In nearly every case, the interviewer highlighted the importance of personal narratives and stories in lobbying and campaign messaging. Since the political point is also personal, many of the interviewees discussed how telling stories of queer people's lives was particularly important at creating change, especially with legislators.

One of the primary ways stories can be used as tools for political change is through lobbying. Diego Sanchez argued that, "What you do on the ground can be heard by legislators and be respected," and that, "They always need examples of family stories to illustrate why the side that needs to be winning." Rebecca Dinwoodie also pushed this idea, saying, "Putting forward these voices makes it so that the legislature might be able to relate to more, and might be more open to hearing the message." This falls into the definition of lobbying and is an appeal to emotion that makes a discriminatory law's impact more tactile in people's minds. Hearing about the impact of a marriage ban or employment discrimination can sway people to join the marginalized peoples' side.

On the other end of the spectrum, Vivian Topping discussed the importance of using stories to debunk myths. She said that it was important when talking to people to address right-wing talking points against LGBT+ (particularly trans) people to get them to "really think it through and remember," using stories to do so. This is a way of giving people tools to combat misinformation and humanize LGBT+ people. Brian Bond also discussed the power of stories to sway people to your side through humanization, saying that stories from parents and family members about the impact on kids makes a possibility in moving people up the "ladder of engagement." When people see LGBT+ people as people, it becomes harder to deny them their rights or see them as the negative, dehumanized stereotype they are often portrayed as. This may lead them to want to participate in a pro-LGBT+ campaign, or at least cease spreading anti-LGBT+ rhetoric.

One of the major campaigns that used stories was the campaign to pass ENDA, the Employment Non-Discrimination Act, which has floated around Congress since 1994. Candace Gingrich said that one of the roadblocks with ENDA was that most Americans thought it was already illegal to fire somebody for being queer, meaning they didn't care to advocate for it. This necessitated explaining what the Act was for and involved getting people to share their stories of LGBT+ employment discrimination with their members of Congress and the public. Gingrich said, "If you don't know somebody's story, you're not going to understand how an issue impacts a person."

ENDA never became law, but that does not necessarily mean that the use of stories was unsuccessful in every way. Bond also qualifies the use of stories with legislators, saying that it might not be effective right away or with a particular legislative cycle. He said that activities like connecting LGBT+ people and/or their parents to talks with a member of Congress do have an impact, either direct or indirect. Bond said that the

immediate goal might be lost, but that, "Even if that Senator doesn't vote for the legislation you want, maybe that Senator or member will ratchet down the [opposing] rhetoric."

This idea speaks to a campaign's "long game" strategy being a necessary resource for a campaign's success. Gingrich brought up the same point in their strategy to pass ENDA: "When it was time to lobby members of Congress…we could go to them and say, 'You didn't read about this in the newspaper…but here's your constituent.'" Stories have the power to transcend time and can have impacts beyond pushing policy in the short-term. Changing people's hearts is the primary function of sharing these stories, to the degree that they then join the cause, or at least tone down their opposition.

The idea that stories are useful tools for creating political change speaks to how social change appears to be a main driver for political change. It can be concluded that activists need to start their campaigns with a goal of making social change to make their political goals more socially acceptable. Personal narratives are an effective means to make social change, either in preparation for a planned "rights episode" like a ballot measure or just to build on over time.

However, this can be flipped on LGBT+ activists. Stories of people that were harmed or slighted by LGBT+ people can be used to socially reject LGBT+ people further and motivate people to back anti-LGBT+ bills. Returning to the example of transgender athletes, stories of people that were beaten in their sport by a transgender person circulate with the narrative that transgender people have unfair advantages in gendered sports (Sanchez 2022). The consequence of these narratives being built up is two-fold: it leads to broader support for bills banning transgender athletes from participating in sports, and it contributes to the dehumanization of transgender people. This is the type of thing LGBT+ activists do not want to happen, and when both proponents and opponents of LGBT+ rights use this method, it further politicizes the issue.

4.5 MOBILIZING VOTERS AND VOLUNTEERS

Bringing everyday people into the field of advocacy was echoed largely throughout many of the conversations I had for this research. Sanchez also discussed the core of the advocacy done at PFLAG, where people are mobilized by getting them to go to rallies, visit their legislators, and speak at hearings. Sanchez also touched on the importance of highlighting the vote in activist messaging, saying, "The reason that it's important is because in addition to the President, you elect who nominates every judge. Then you also have the Senate who has to vote for that judge at every federal level." He then brought it back to lobbying by saying, "Then the advocacy steps in: once the President nominates a judge, then you start advocating with the Senate to move them forward or to stop them."

Rebecca Dinwoodie characterized her work at Basic Rights Oregon as unique compared to work she had done in other states; "Since Oregon has ballot measures, we had lists of voters and activists and donors in the state, something other states didn't have." With this information, Basic Rights Oregon was able to do sophisticated vote counting efforts where they were able to identify voters who could be or needed to be swayed to BRO's side in upcoming elections.

McAdam's third factor of a political opportunity, creating a critical mass of people (McAdam 2013, p. 51) resurfaced in Dinwoodie's discussion about bringing LGBT people into the advocacy fold. She expressed that Basic Rights Oregon is "good at doing a mix of social events that are fun and political events to bring the entire community in." She brought up the idea of an "arc of activism" to describe how people were brought into the movement: "bring people into the movement through fun and community, then

seeing rights wins motivates more participation - creating lots of ways into the community…was about togetherness: feeling safe and good to be queer, but also with opportunities to mobilize people." A critical mass cannot be made when the community is isolated, and breaking those barriers while giving queer individuals agency to make political change certainly helped create the political opportunity that led to marriage equality in Oregon.

Dinwoodie also spoke about the importance of social movements and media representation, arguing that the political movement works in conjunction with the coming out movement. She spoke of the snowball effect that began in the 60s as people started talking about homosexuality which led to these issues becoming political ones nationally. Then "bit by bit, National Coming Out Day, college campuses, and churches having to decide what they thought, it wasn't just happening at the political level." On the social level, Dinwoodie highlighted that representations of LGBT+ people in media were critical in mobilizing people. She gave an anecdote from the late 1990's: "Ellen DeGeneres coming out mattered. We helped organize [*The] Ellen [DeGeneres Show]* watch parties in swing districts to get more volunteers."

Finally, Dinwoodie explained how meeting people where they were was beneficial to getting them to join a campaign. Her work involved the entire state of Oregon, where she organized and ran voter registration talks in places like churches, colleges, and bars with the purpose of registering queer people to vote in swing districts. Of this work, she cited, "The Internet, especially in rural areas," as a crucial tool in helping people realize they were not alone in their queerness. Spreading awareness of queer issues while allowing the average queer person to engage actively in work on the campaign served both political needs (meeting the campaign's policy goal) and social needs (increasing LGBT+ visibility and acceptance).

4.6. PUBLICIZING THE MESSAGE

Increasing awareness of queer issues and campaigns meant to solve them both with queer people and the general population is another key activity contributing to the success of LGBT+ rights campaigns. Not only does it put LGBT+ issues on the table, allowing people to conceive of a solution to them but it also contributes to mobilizing queer populations as political forces and promoting social acceptance of LGBT+ people (Epp 1998, p. 15-17). However, as explained in some of the interviews, finding the right mode of publicizing the message is critical to getting the advocate's desired outcome.

One salient example of campaign messaging was brought up by Rebecca Dinwoodie. During her time campaigning for same-sex marriage in Oregon, she said the initial messaging the community came up with was: "There are more than a thousand rights and responsibilities that come with marriage, and LGBT people should have the same rights and responsibilities as other couples." These include hospital visitations, the right to choose a burial plot, inheritance rights, among many other things. However, this messaging "kept not winning," according to Dinwoodie, which she attributed to the "yuck factor," which is the assumption that straight voters would not want to think about two men kissing or having sex.

However, once the messaging was switched away from "rights and responsibilities" to "love is love," the campaign started to gain traction. By asking people questions like "How do you feel about your marriage? That's what we want," and saying, "We want our relationships recognized civilly," people started to become more supportive of marriage equality in the state. Dinwoodie noted this shift happened only after the message was shifted from something more "cerebral" to something more digestible within the culture. This agrees with Epp's concept of culture influencing

political decisions, since social cues and consciousness influences whether one with political power can conceive of a right existing (Epp 1998, p. 15-17).

Candace Gingrich had a similar experience at the Human Rights Campaign, specifically citing the use of social media and email as highly useful in expanding the scope of their organization's advocacy efforts. They said that having the ability to send instant messages to the masses to keep them informed and aware was a great way to keep younger voters especially engaged in and beyond election years. Many of these social media posts and emails centered queer stories, so as much of this work is political, it is also personal. Getting to the heart of queer personhood is what inspires people to join the advocacy fight and for people to decide to support policy advancement for LGBT+ rights. However, Gingrich also noted that "we also know [the internet] is very easily used for disinformation," in this case perpetuating harmful stereotypes about LGBT+ people.

Speaking to a similar phenomenon, Vivian Topping said that her organization had a clear understanding that their opposition's message was rooted in myths and stereotypes about LGBT+ people. In her experience, sending the message had a critical timed element to it. If the opposition had gotten a "big, broad enough audience" first, they would, for example, "control the narrative with these fear-mongering commercials about trans people in bathrooms." It is evident that publicizing the message, while working toward social acceptance of LGBT+ people, must also dispel negative myths and perceptions of LGBT+ people.

4.7. PUBLIC EDUCATION

Another facet to successful campaigns is the educational component. When discussing cultural frames in political movements, Epp talked about "rights consciousness" which essentially suggests that rights cannot be won unless people are cognizant of them. Further, the public's consciousness of the rights of a certain group must be accurate (or not co-opted by opposition) to have a better chance of winning a rights episode. People may be against LGBT+ rights advancement because they do not know enough about it; lack of knowledge can make people more susceptible to believing anti-LGBT+ myths. Making clear not only what the policy on the table is but also why LGBT+ people deserve to be treated equally is crucial in making sure voters are informed while also swaying them to one side. This is the "changing minds" piece of the "changing hearts and minds" idea.

Vivian Topping had to combat many myths in the various campaigns she has worked on, and she said much work was done to combat rhetoric that transgender people were dangerous. Part of this work was canvassing, which involved "just asking folks 'what's your first reaction to non-discrimination protections for trans people?'" Then her and her team would bring up their opposition's message and walk people through it and why it was disingenuous. She said that

"The entire crux of our campaign was us being able to have those conversations with voters ahead of time."

This type of work is very labor-intensive, but ultimately worth it for both political and social progress gained. Rebecca Dinwoodie also discussed how Basic Rights Oregon did more "broad education" and was there to whenever there was an anti-gay ballot measure. Candace Gingrich echoed this sentiment, saying, "If people don't know us, they're going to continue to believe stereotypes and myths and misconceptions." This solidifies the idea that education is the primary way to change people's minds. Alongside storytelling that highlights the humanity of queer people, public education campaigns are good ways for activists to clarify their message and get people to think more fairly and more humanely about LGBT+ issues. Most of this work is done by

larger organizations with more resources but it can also be done by smaller-scale groups and campaigns if they get the support they need.

Education can be used to make people more socially accepting of LGBT+ people, but this type of activity can also do the reverse. Topping, Dinwoodie, and Gingrich all discussed combatting stereotypes and misconceptions of LGBT+ people, but it should be mentioned that campaigns which reinforce those negative perceptions can do similar work in opposition to social and political progress. In the case of the current rise in anti-LGBT+ legislation across the country, it is not a stretch that the spread of negative stereotypes––especially that of transgender people––can contribute to society becoming less accepting of LGBT+ people and more receptive to harmful legislation.

4.8. RESOURCE DISTRIBUTION

Combining McAdam's, Anderson's, and Epp's theories generates the assumption that a mechanism to distribute resources to activists should exist to properly seize a political, legal, or social opportunity. In particular, Epp discusses support networks for individuals pursuing litigation, and this idea can be applied more broadly to a movement, especially when nonprofit organizations are involved.

Candace Gingrich's work at the Human Rights Campaign shifted from the legislative side to the foundation side, which mostly covered fundraising, education, and outreach, over the course of their time there. They said that they spent their time "learning and finding out what college students were trying to do and asking "'how can we help you achieve that?'" In this way, they were providing resources and tools to enable students to do that kind of advocacy on the ground — like funding a queer resource center on campus, for example.

Additionally, in the wake of the current legislative assault on LGBT+ rights taking place across the country, they highlighted the importance of helping those who are impacted directly by loss of civil liberties. They said to "acknowledge the little things…volunteer at a shelter, if you can donate five dollars…because those are the things that are going to be our little sandbags that keep the really bad stuff from happening." Direct aid to those affected can be considered a form of activism and helping those who are struggling is necessary to maintain unity as a community. McAdam's political opportunity factor of connecting insurgents to resources they need can be seen here. Not only in the fact that people are getting supplies and finances to protest, but also to foster community and unity.

They also mentioned how direct aid helped push along the political and legislative work by increasing visibility and support networks for LGBT people more broadly. This follows Epp's logic of cultural consciousness influencing policy. They said, "We're not going to achieve equality from the closet," and they credit campaigns like the Coming Out Project, despite not having a specific political goal, with impacting successful legislative outcomes. With this work, "it went from, 'oh, those people' to my neighbor, my aunt, my teacher…and that had a huge impact on things." This along with direct aid is the type of support that "supports everyone," and helps to grease the gears in the political process to create political change.

4.9. CIVIL DISOBEDIENCE

Returning to McAdam's Political Opportunity Theory, a type of "spark"—an event that grabs people's attention or makes an issue obvious—can be helpful, if not necessary, to build momentum in a movement or a campaign. Many times, a "spark" manifests as an act of protest, as it has throughout the LGBT+ rights movement in the United States since the mid-twentieth century. The theory holds that without there being an event to motivate

people for a cause, it can be harder to reach a critical mass necessary to create political change.

In our conversation, Candace Gingrich acknowledged the importance of civil disobedience, primarily in the form of marches and protests, in creating public visibility and motivating people politically. They said that it is important to participate in that work if you can, because "it's that solidarity…it recharges you and reinvigorates you…to be standing shoulder to shoulder with people that are with you on an issue and that care very much and passionately about it." Qualifying this, they said, "It sparks that conversation, [which] hopefully is portrayed accurately in the media, so people that might not have attended the rally can know that it happened." If portrayed in a negative way in the media, the message can be lost and can turn people away from supporting the cause.

However, getting attention on the issue at all is crucial to creating change. They said that "for every march that happens in the street, a senator opens their ears." Without these marches or other organized protests originating in the mid-twentieth century, there would not be a Coming Out Day, and many organizations doing broad advocacy work today would likely not exist. Gingrich said, "The rallying, the student walkouts in Florida, in Idaho, in Iowa, students going to the state capitals, being very present in Texas…" is what forces people to recognize that injustice or unfairness is taking place.

4.10. DRAFTING POLICY

Diego Sanchez talked about the importance of having a "seat at the table" in his work with the Democratic National Convention when drafting the party platform. He also worked as a senior chief policy advisor for a member of Congress, so he had power there to draft the language of the bills his office produced and sponsored. When LGBT+ people can be a part of drafting policy which affects them, a strong political opportunity is revealed. However, this could only be created if there were allies on the inside that gave those marginalized people the opportunity to participate, highlighting the necessity of amicable insider/outsider relations. Moreover, Brian Bond, who also worked for the Democratic Party, added that "the most important piece of the LGBTQ Victory Fund at the time was to have a seat at the table," solidifying this point.

This strategy, while arguably the most effective in getting LGBT+ policy made and implemented, is the most difficult to set up. An activist would either need to be a worker on the inside, like Sanchez and Bond with the DNC, or have robust relationships with insiders who would allow them to draft bills. It is common for lobbyists to write bills and submit them to a member of Congress to consider. However, without a relationship between the insider and the lobbyist or issue, it is less likely to be introduced. Bond's job at the DNC was created specifically out of a desire to mobilize LGBT+ voters, and Sanchez's connections while working in nonprofits gave him the opportunity to advise the Democratic Party's 2008 platform. For outsiders to draft policy or to become insiders, the political institution must see value in giving them the space to do that work, which I will expand on in the *Democracy* section.

4.11. STRATEGY IN MOVEMENTS AND CAMPAIGNS

Implicit in the Political Opportunity Theory is the idea of strategy, which includes the methodology for a campaign or a movement. Legal Opportunity Theory adopts a singular method — the judiciary — to reach a rights win, but the strategy can also be more specific to a particular case. Crafting a strategy to gain the resources and meet the conditions necessary to create a political opportunity, in addition to the strategy necessary to win a specific right, is crucial in how social movements function.

Evan Wolfson discussed the importance of strategy––both in movements and individual campaigns––to achieve success. On why he believes strategy is important to campaigns, Wolfson said, "The Constitution is at best a promise, not a reality. So, we have to make it real, we have to deliver on it, we have to enforce it." In saying this, Wolfson is asserting that every activity that a campaign does should be in service of the goal, which should always be to force the government to afford the rights enshrined in the Constitution to the people. Whether rights are gained through legislation or litigation as the primary method, the rights always emanate from the Constitution; it is the methods of gaining those rights that determine strategy.

To explain his point, Wolfson used a metaphor that he discussed in previous interviews—the "ladder of clarity." The top rung represents "where you want to go…the goal," the next rung is the strategy, the next is the "mix of vehicles," and the last rung represents action steps (Wolfson 2015, p. 237-240). He echoed this metaphor in our conversation, and it provides a clear roadmap for how to structure a campaign. Notably, this is the structure he used for his work in a same-sex marriage campaign, which ended up succeeding in 2015.

Part of having a strategy is understanding the "long game" of a campaign or movement. Wolfson said that knowing that achieving political and social change through campaigns requires time, building a plan with a longer time span is beneficial in keeping a campaign on the right track. To make a long-term strategy, Wolfson argues that a campaign organizer must know "how to organize appropriately, how to get buy-in [and] recruit allies." Within these broader goals, Wolfson also highlighted the importance of planning tactics such as messaging, persuasion, electoral work litigation, legislation, and fundraising so they work together to serve a campaign's overarching strategy. Keeping all these things in mind while executing a campaign is likely part of why having time, money, and people on-hand is necessary to achieve success.

In previous interviews, Wolfson discussed how the marriage equality campaign was "multi-method," meaning that it used a combination of litigation, public education, direct action, lobbying and legislative work all in service of a single strategy with a single goal (Wolfson & Johnson 2014, p. 851). For these methods, there are different vehicles you can choose, the primary ones being a court or a legislature.

Due to the fact many LGBT+ rights wins have been achieved through the Supreme Court, including the right to marriage equality, it makes sense why many advocacy campaigns use litigation as their methodology. Based on his experience with Freedom to Marry, Wolfson said that "litigation alone was not sufficient [citing numerous case losses for LGBT rights] …what we then argued and developed…was a strategy that combined the methodologies litigation with the other methodologies and approaches to enable that litigation in the Supreme Court to succeed." This answer agrees with Anderson's condition for litigation strategy, that the question needs to be justiciable to succeed with this method (Anderson 2004, p. 9).

The other primary method LGBT+ rights campaigns implement in their strategies is legislation. Through this method, Wolfson explained that lobbying would be a central activist activity, but even then, it is likely that other methodologies will need to be drawn upon to achieve success. For example, using the media as a method for running a public education campaign in conjunction with lobbying legislators. He also brought up electoral work, fundraising, and direct-action protest as supplementary methods to the primary legislative. Essentially, Wolfson argues that successful campaigns organize themselves around a specific decision-maker, tailoring their activities to

synchronize with whichever primary method is chosen. In doing so, he also lists several activities that the other interviewees mentioned as successful activist activities, solidifying their importance.

Wolfson employed this ideology into his organization's marriage equality strategy. He explained how his strategy was to work on three tracks (legislation, judicial decisions, and social opinion) simultaneously: "We were going to build a critical mass of states where same-sex couples could marry, because…marriage happens at the first instance in the states." Here he is echoing McAdam's third necessity for political opportunity being critical masses. Organizing and strategizing around the various resources and activities activists have at their disposal is crucial in creating rights wins, and often it takes several years for activists to create that "critical mass" necessary to do so.

4.12. CURRENT AND FUTURE FIGHTS

At the conclusion of all the interviews, I asked each interviewee what they thought about the current political environment for LGBT+ issues at all levels across the country. For the most part, answers to this question were centered around a concern about education and anti-LGBT+ bills (anti-trans bills especially) cropping up around the country. There was also a focus on intersectionality and how the LGBT+ community might seek to further their work with other identity groups, such as the Black community, in the future for civil rights.

Candance Gingrich found that the coalition work that was done between groups representing different populations was itself a form of intersectional advocacy. They said, "it's all about intersectionality. We've been doing intersectionality in advocacy… coalition work is intersectionality." Linking the LGBT+ struggle to other current political battles, they brought up other political targets, such as reproductive rights. They said that these issues are often used to rally up political bases around a common enemy for the purposes of achieving a political goal. In this case, contesting LGBT+ rights is something used to motivate more conservative voters to support the Republican Party on their own, simply because the Democratic Party supports LGBT+ rights. This is the story for other civil rights campaigns and movements, as will be discussed.

There was discussion with Diego Sanchez about how the current political attack on LGBT+ rights could spur even more pro-LGBT+ advocacy. Referring to the 2020 murder of George Floyd, Sanchez said, "Some things are driven by an incident. We have the high rate of trans women being murdered. Those are all incidents that lead to an issue." Other examples of incidences that start movements include firings or children being sent home from school on account of identity classifications. An incident of injustice can provoke a response through all kinds of advocacy channels, such as protesting or lobbying.

This focus on intersectionality was mirrored in the other interviews. Vivian Topping began her answer by addressing the current political backlash against Critical Race Theory and book bans in public schools that also affect LGBT+ people. She said that the anti-CRT bills, which ban discussions of systemic racism in public schools, being proposed and passed in states throughout the country also include prohibition of LGBT+ topics and history. Topping mentioned that these types of bills have been proposed for years, calling them "Don't Say Gay" bills. This is a particularly salient point as Florida recently passed its own "Don't Say Gay" bill.

Topping took care to discuss the current LGBT+ political environment in Florida, as it has changed dramatically since the bill was passed. She said that in 2021, Florida passed the first anti-LGBTQ law in their state in 23 years (a trans athlete ban). In response, Equality of Florida, a pro-LGBT+ organization, has been working to stop future anti-

LGBT+ bills from becoming law. Regarding the 2022 "Don't Say Gay" bill, they ran large-scale digital ads about the bill with public figures like Chasten Buttigieg and President Biden speaking out against it. They thought they were in a good position, since the 2021 trans athlete ban "moved really quickly" into law seemingly because it did not have as much publicity.

However, despite having broad ally coalitions, other necessary resources, and strategies that have been successful in the past, this campaign against Florida's 2022 "Don't Say Gay" bill seems to have failed. This points to a larger political problem that stifles political participation and diminishes fairness, which will be a topic of discussion later in this section. Topping discussed the stark uptick in anti-transgender bills nationwide: in 2019 there were 35 anti-trans bills, but in 2021, there were 198 (Equality Federation 2022). This is eight times as many bills in only a two-year period of time. In trying to explain this rapid increase, Topping said, "I think that we are dealing with a different Republican party than we had before." Meaning, a Republican Party that aggressively villainizes a social group, exploiting societal biases and negative perceptions of marginalized groups, to serve their own political gains.

Historically, this type of villainization ended up having a strong impact on LGBT+ political and social organizing. Rebecca Dinwoodie noted that in response to all the anti-LGBT+ measures being proposed and passed, "people were forced to get organized." As a result, LGBT+ people themselves became politicized and Oregonians had to think about their position on the matter. If someone had a family member who came out, "it had a different implication because people were voting on the rights of their family members and friends." Here, social acceptance begets political support, so portraying the LGBT+ identity something to be outlawed allows anti-LGBT+ advocates to politicize the LGBT+ identity while serving their own political goals.

Ever since the late 1960's, LGBT+ people have been viewed as a political issue. Activists fight for their rights and campaigns fight for their votes. Vivian Topping predicts that "there will be a significantly higher investment in LGBTQ folks... prepping for 2024 [elections]." She believes that the focus on trans youth as a wedge issue only benefits anti-LGBT+ advocates, and that investment will be needed to prepare for that threat. Similarly, Candace Gingrich spoke about the need to pass gay conversion therapy bans federally and across states. They discussed how the extra layer of religion and faith "adds a layer of complexity" to getting that policy through — and certainly is the case for most LGBT+ policies more broadly.

Evan Wolfson brought up the need to educate and prepare future activists and public leaders. Of his work "growing the next generation of leadership to make sure it's diverse and strong," he said, "It is a...diffused form of advocacy...in a sense that it is trying to inspire and instruct a next generation who you hope mostly will go out and do good things." This could also be categorized as "changing hearts and minds," to motivate people to participate in the fight for LGBT+ rights, but ultimately, it is up to the individual's discretion what they want to do with any power they may acquire in their life.

Candace Gingrich also touched on the impact of advocacy on the next generation to grow the movement. They said folks, including children, "see this [anti-LGBT legislation] and see that it's bullshittery," but that they do not have the ability or capacity to fight against them. It is important, in the landslide of legislation condemning adults and children for aspects of their identity, that effected groups feel empowered to make changes. They need to see a place for themselves as elected officials, decision-makers, and activists. This is all

so, as Gingrich put it, "They can be the ones who undo what others have done."

4.13. DEMOCRACY

Without the democratic structure that the United States has in place, none of this advocacy or rights-chasing would be possible. Working within the democratic political institutions of the federal, state, and local governments across the country is crucial in making sure people's rights are protected.

Brian Bond said that his work at the Victory Fund had the goal of getting people elected within a party structure, which meant that LGBT+ candidates needed to be treated fairly in the media. At the end of the day, finding supportive votes and turning them out is the primary goal of all LGBT+ political activism. In the 1990s, the Democratic National Committee identified LGBT+ voters as a significant enough voting block to create a position solely for outreach. Bond said, "It's amazing how things move faster if you have something to give and guess what the community had: votes." Votes are political currency, and once LGBT+ people proved themselves a large-enough interest group to democracy, they were treated legitimately by the institutions.

This phenomenon also includes LGBT+ political and social allies. According to Candace Gingrich, part of their strategy at the Human Rights Campaign in 2005 was to hold voter registration events at universities in swing districts. As a result, the youth vote "exceeded itself in the past twenty years" and "most of the candidates supportive of LGBT+ rights were elected." This speaks to the importance not only of mobilizing queer populations in democratic participation but finding groups that are also supportive and mobilizing them too. In this case, the ally group was younger voters, showing that ally coalition building is also key in voter identification as well as other activist activities.

Brian Bond argued that activists should always be concerned with finding and targeting votes. He cited following demographic changes in cities and states and changing a campaign's messaging accordingly as integral to connecting with voters and recruiting them to your interest group. However, because of tactics like gerrymandering and voter suppression, both parties have created an environment where Bond says, "People are pandering to their base in the primary, and there is no real general [election]." The democratic environment which allows interest groups to use their vote to mandate political change is degrading, and whether that benefits or harms LGBT+ rights, Bond argues "[it's] a problem for advocacy. That's a problem for democracy. That's a problem for this country."

Echoing this concern, when asked what important political fights he saw happening currently or foresaw, Wolfson said, "defending our democracy itself." This concept was an underlying theme in each of the conversations I had with the interviewees, especially when we discussed things happening in the current day. When democracy is rigged, it can make certain policy changes much harder, if not impossible to achieve. The activist tactics discussed in this research all operate under the assumption of a free and fair democratic system, and without that, there is little to be done. This rigging (such as with gerrymandering and voter suppression) can explain the halting of the federal Equality Act and other progressive bills in the current Congress. Either way, defending democracy and defending the vote is crucial to defending the rights promised to the people in the Constitution, as handed down by the three branches of the government and all the states. As Candace Gingrich put it, "It's lifesaving stuff. Legislation can and does save lives."

CONCLUSION

This research illuminates not only what advocacy

needs to work, but also why we need advocacy to work. While the subject pool was relatively small, each interviewee had a strong story to tell and unique insight into the fight for LGBT+ rights. However, be sure to keep this limitation in mind when digesting these ideas and further your research into the subject.

Social equity is a responsibility of public administrators, and outsider activists keep them accountable for upholding it through policy. This is done at a smaller grassroots level and at larger organizational levels. Change seems to happen during specific moments as a response to unfair treatment or policies, and the momentum snowballs with either rights wins or losses. Networks are created outside the government to create social change, and when enough pressure has built, political change follows. Interest groups and nonprofits act as the direct lines of communication between activist ideas and policy makers, and spaces within the federal legislature have been created for LGBT+ activists to do work for policy change.

To be successful, advocacy campaigns need adequate time, money, labor, unity, allies, and access to a democratic environment. What counts as "adequate" depends on the scale of the campaign. Allies can be either coalitions built with other organizations for the purposes of pushing for a particular policy, or coalitions with the aim of promoting social change and acceptance for LGBT+ people. Since advocacy is a form of political participation in a democratic process, democratic institutions need to be robust, and legislators must be receptive to the needs of the constituency for advocacy to work. Additionally, building trust between insiders and outsiders with governmental institutions is crucial to ensuring a synergy between the two sides, which leads to a better chance of successful policy outcomes.

Successful advocacy strategies employed in the LGBT+ rights movement in the United States include using personal narratives to influence legislators, educate the public, and personalize the struggle for rights to promote social acceptance; having a strong and clear public education campaign to dispel myths about LGBT+ people and counter bigoted resistance equality; distributing resources to activists and/or individuals that need them; and the participation in and the unbiased reporting of acts of civil disobedience (like protests) to promote the message and create direct action toward a particular advocacy goal.

Having a strategy and beginning with a clear goal that includes the particular methodology, actors, and action steps necessary to achieve that goal is beneficial to campaigns by helping them make effective use of their resources. Also, being patient and playing the long game with strategy is most often the reality of advocacy.

Activists involved in current fights, including the stonewalling of federal LGBT+ equality policy and the cropping up of anti-LGBT+ bills and laws in states across the country, are all facing a particular struggle caused by the recent eroding of democratic norms and institutions. When the Republican Party gerrymanders legislative seats at the state and federal level, and the Republican Party is determined to prevent LGBT+ equality from being realized, it is very unlikely any political progress in this area will be made. Additionally, purposely making the LGBT+ community a political target to rally up the conservative base is further stoking divide and creating an increasingly unsafe environment nationwide for LGBT+ people.

It is important to keep in mind that LGBT+ people are not the only ones under threat with this current political reality––women, Black and Indigenous people of color, Asian people, and people with disabilities are too. Resentment toward these groups that has existed for centuries is currently being used to prevent social, political, and economic equality by the White, male, and Republican elite. In this fight, coalitions must stand together and push for each other's needs to

be met by the government, calling not only for certain policy goals, but for the proper democratic norms and institutions that the country needs to effectively serve its population.

Protecting the process that creates policy is crucial to protect vulnerable populations, LGBT+ and beyond, and therefore advocacy methods need to be properly assessed. Without advocacy and the tireless work of many people (including those that took part in this research project), we would not be anywhere near where we are today in terms of civil rights for LGBT+ people. There is always hope for resistance to unfair treatment if you start with yourself and keep these ideas in mind as you go on living in the world. Anyone can be a force for good but understanding how to best use your power through collectivizing, strategizing, and doing the work on the ground can open the door to a better future for all people, regardless of identity.

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Monitoring Infant Neurodevelopment via the Hammersmith Neurological Examinations in Cambodian Infants at Risk for Thiamine Deficiency

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ABSTRACT

Thiamine deficiency is a condition that affects millions of infants in South and Southeast Asia due to heavy cultural reliance on thiamine-poor, polished white rice as a dietary staple. Previous research suggests that a thiamine-deficient diet not only endangers infants' health, but also hinders infants' neuro-cognitive development. As part of a larger, randomized controlled trial, this thesis investigated possible benefits of maternal thiamine supplementation for protecting the neurological development of Cambodian infants who are breastfed. Lactating mothers were randomly assigned to four treatment groups (0, 1.2, 2.4, and 10mg daily thiamine supplement) when infants were between 2- and 24-weeks postnatal. Infants' neurological function was measured at 2-, 12-, 24-, and 52-weeks via the Hammersmith Neurological Examination (Hammersmith), a field-standard clinical assessment tool. As expected, infants' Hammersmith scores improved significantly with age. However, the data indicated that maternal thiamine supplementation dose had no effect on infants' Hammersmith scores. This research indicates that the basic neurological functions, as assessed by the Hammersmith in early infancy were relatively unaffected by maternal thiamine supplementation.

1. INTRODUCTION

Thiamine, also known as vitamin B1, is a micronutrient essential for human health, well-being, and overall growth and development, including neurocognitive development. In some regions, such as Southeast Asia, thiamine deficiency is common, due to heavy reliance on polished white rice as a dietary staple. This puts infants at risk for delays and deficits in growth, health, and neurocognitive development.

The present thesis was part of a larger randomized controlled trial investigating the possibility that supplementing lactating mothers with daily thiamine might benefit their infants' growth and neurocognitive development. This study was undertaken in Cambodia, and the thesis specifically examined possible relationships between maternal thiamine supplementation dose and measures of infants' growth and neurocognitive functioning. The following literature review will outline the role that thiamine plays in human physiological processes, how thiamine is typically obtained through the diet, and the current research on how much thiamine humans should consume. Then, this thesis will focus on the specific role of thiamine in neurological function and neurocognitive development, in particular motor skill, myelination, synapse formation, emotional

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stability, and cerebral metabolism.

2. LITERATURE REVIEW

2.1. THIAMINE

Thiamine is present in the body as free thiamine, as well as in several phosphorylated forms: thiamine monophosphate (ThMP), thiamine diphosphate (ThDP), and thiamine triphosphate (ThTP). Thiamine contributes to metabolic processes, such as carbohydrate and amino acid metabolism, and circulates to cells with high metabolic demands (I.e., liver, brain, pancreas, heart, and skeletal and smooth muscles) (Whitfield et al., 2018). Moreover, thiamine acts as a cofactor of several enzymes, such as pyruvate dehydrogenase complex and ketoglutarate dehydrogenase. These enzymes are essential in Krebs's Cycle cell energy production, which allows cells to respire and process energy. Not only does thiamine maintain and play a role in the energetic metabolism of the cell, but it also acts indirectly in lipid nucleotide formation (i.e., building DNA in fats). In the central nervous system (CNS), which consists of the brain and spinal cord, thiamine plays a fundamental role in neurophysiology. For instance, it participates in producing neurotransmitters underlying neural signaling, modifying ion channels to allow ions to enter cells for chemical or neural processes to occur, and playing a role in membrane structure and function stabilization (Dias, Silva, Doyle, & Ribeiro, 2013).

Since thiamine can only be stored in insignificant amounts and has a short half-life, it must be consumed frequently (Whitfield et al., 2016). Humans can obtain thiamine through their diet from whole grains, yeasts, meats, legumes, and nuts. However, in Southeast Asian countries, such as Cambodia, their dietary staple is thiamine-poor, polished, white rice. Additionally, there is a lack of dietary variation, which makes it challenging to consume enough thiamine for the body's demands. The recommended nutrient intake (RNI) of thiamine is 1.2 mg/day for men and 1.1 mg/day for women, which increases to 1.4 mg/day for pregnant and 1.5 mg/day for lactating women. In infancy, the adequate intake is thought to be 0.2 mg/day (0–6 months) and 0.3 mg/day (7–12 months) (Whitfield et al., 2018). When mothers are thiamine deficient, they produce thiamine-poor milk. As a result of low maternal milk thiamine levels, the mother's offspring would be at considerable risk for thiamine deficiency and other adverse outcomes. Hence, 70–100% of infants and 27–100% of reproductive-age women in Cambodia are estimated to be thiamine deficient (Johnson, Fischer, Thacher, Topazian, Bourassa, & Combs, 2019).

Based on the diet in Cambodia, fortification -- a sustainable, cost-effective, and passive intervention -- is a possible solution for improving maternal thiamine intake (Whitfield et al., 2019). For instance, fish sauce – a widely and frequently utilized condiment -- could be used for thiamine fortification. In Prey Veng province, Cambodia, researchers performed two small, concurrent randomized controlled trials of thiamine-fortified fish sauces for over 6 months to determine whether thiamine-fortified fish sauce raised thiamine levels (Whitfield et al., 2018). Mothers consumed one sauce fortified at 2 g/L, one at 8 g/L, and one control sauce. As a result, maternal consumption of thiamine-fortified fish sauces significantly increased erythrocyte thiamine diphosphate concentrations (eTDP) in mothers and infants, and mothers had higher milk thiamine concentrations. The Whitfield et al. (2018) study indicated that thiamine fortified fish sauce could improve thiamine levels in Cambodians, particularly infants, to prevent adverse outcomes or thiamine deficiency. Namely, when infants had adequate thiamine levels, their bodies can grow and function properly. While fortified fish sauce did enhance thiamine levels, commercially produced fish sauce that has the potential for fortification may not be helpful for reducing thiamine deficiency in the poorest

communities who make their own fish sauce. Further, consumption of this condiment is not universal in all regions where thiamine deficiency is common (Whitfield et al., 2019). For this reason, fish sauce is not an ideal vehicle for thiamine fortification.

Conversely, thiamine fortification of salt has the potential for combating thiamine deficiency because salt is low-cost (Whitfield et al., 2019), centrally manufactured, and widely utilized. However, both the levels of salt intake of lactating women and the amount of thiamine fortification required to optimize milk thiamine concentrations are unknown. Therefore, there is currently no fortification program for thiamine in Cambodia and thiamine deficiency remains a public health issue in Cambodia and much of Southeast Asia. One of the aims of the randomized controlled trial (of which the present study is one small part) was to investigate key background questions that set the stage for undertaking thiamine fortification in Cambodia.

2.2. THIAMINE DEFICIENCY AND NEUROLOGICAL IMPAIRMENTS

Beriberi is a serious and even fatal medical condition caused by thiamine deficiency. The previously mentioned diet deficiencies make it so infantile beriberi-related mortality is still common in Southeast Asia. Beriberi is particularly serious in infants due to rapid physical and neurological growth and development during this time and high thiamine needs compared to body size. There are two categories of beriberi: Wet beriberi affects the cardiovascular system and is accompanied by edema, whereas dry beriberi affects the peripheral nervous system (Whitfield et al., 2018).

Wernicke's encephalopathy is another neurological disorder related to thiamine deficiency. Infants with this disorder exhibit abnormal eye movement, gait ataxia, and cognitive impairment. The most severe form of Wernicke's encephalopathy is Korsakoff's psychosis, in which patients are profoundly confused, and display confabulation with little or no working memory (Whitfield et al., 2018).

The most famous case of infantile neurological deficits due to thiamine deficiency was the Israeli Outbreak in 2003. Several infants with encephalopathy were in pediatric intensive care units in Israel, and two died of cardiomyopathy. In addition, a 5.5-month-old infant arrived at the Sourasky Medical Center with rapid uncontrollable eye movement, weakness, paralysis of the eyes, vomiting, and Wernicke's encephalopathy. All these hospitalized infants had consumed a soy-based formula that had low thiamine levels due to thiamine having been inadvertently left out during manufacturing. Two years after the outbreak, Fattal-Valevski et al. (2005) compared neurocognitive progress between 20 infants who had been at risk of thiamine deficiency because of the defective formula and a control group of 20 infants who'd consumed other milk-related sources. The researchers found that, relative to control infants, infants who had consumed the thiamine-deficient formula displayed significant delays in expressive and receptive language development, mental development on the Bayley Scales of Infant Development mental motor development, and age at independent walking. These observational findings provided the first indication of the seriousness of low thiamine intake for infants' neuro-cognitive development, which encompasses several domains: brain structure and neurology, cognition, motor, and sensory skills, etc.

2.2.1. NEUROLOGICAL PROCESSES DURING INFANCY

One of the neurological processes that is affected by thiamine deficiency is coating axons with myelin (myelination). Myelin is a white, fatty matter that coats axons and increases nerve impulse speed. Prior to birth, myelination

occurs in brain areas involved in orientation and balance. After birth, myelination rates in areas involving vision and hearing attain a peak before myelination of areas related to language (Gilmore et al., 2018). Thus, infants would begin to show visual and auditory skills followed by language skills. In addition, oligodendrocytes are glial cells in the CNS that produce myelin. From birth to 3 years of age, the number of oligodendrocytes in cerebral white matter increases rapidly from approximately 7 billion to 28 billion (Gilmore et al., 2018).

During the first year of life, a host of neurodevelopmental processes occur, including neuron proliferation, axon and dendrite growth, synapse formation, pruning, and myelination. Neuron proliferation is the creation of new cells through cell division and this event starts in the 7th week of gestation to at least 4.5 months postpartum (Prado et al., 2014). Most neuron proliferation finishes at birth, but some neurons can be formed in adulthood. Dendrites are projections from cell bodies to make connections with other cells while axons are the portions of the neuron that transmit nerve signals and it can be myelinated. Axons and dendrites start to develop during gestation and continue to proliferate until at least 2 years after birth. Synapses are the ends of the neuron that release neurotransmitters to other neurons. Additionally, they connect between axons, dendrites, and cell bodies, and they begin to form around the 23rd week of gestation and persist throughout life (Prado et al., 2014). Synaptic density peaks at various times in different brain regions. For instance, the visual cortex attains its synaptic density peak between 4 and 12 months postpartum, while the prefrontal cortex reaches its peak after 15 months postpartum. Moreover, reduced synaptic density reflects synaptic pruning, which eliminates extra synapses and starts a year after birth and continues through adolescence.

When infants are developing under adverse circumstances, disruptions can occur in the neurological events described above. In association, infants may show delays in growth metrics (weight, head circumference, and length) and certain developmental milestones, such as grasping objects and walking (occurring normatively at about 52 weeks). For instance, head circumference changes with infants' rapid gray matter and white matter formation (Gilmore et al., 2018). Head circumference may provide a proxy for gray and white matter formation. Similarly, delays in growth, as measured by infants' weight and length, may serve as a proxy for malnutrition that infants experienced both prenatally and postnatally, which in turn may be associated with neurological delay.

This thesis investigated how an infant's weight, head circumference, and length (anthropometrics), measured at 2 weeks (baseline) were associated with their Hammersmith scores and thiamine deficiency. These measures serve as an indicator for infant growth and development meaning they could provide essential information regarding the infant's health and neurological status. They are important because they reflect an infant's health and may relate to neurocognitive development. Additionally, Cambodian infants' growth metrics could demonstrate how they may exhibit delayed growth compared to WHO standards.

2.2.2. IMPACT OF THIAMINE DEFICIENCY ON PHYSIOLOGICAL PROCESSES

Previous studies, primarily animal ones, have examined how nutrient deficiency (i.e., thiamine) affects neurodevelopment. This section will explore both the animal and human literature to demonstrate what is known about the impact of thiamine deficiency on neurodevelopment and physiological development more generally.

2.2.3. ANIMAL STUDIES

Animal studies present a growing body of evidence that thiamine deficiency can also result in long-term cognitive impairments in milder forms. According to Dias et al. (2013), CNS development is influenced by psychosocial and biological factors, as well as genetic inheritance. These factors together increase or decrease cerebral development through neurogenesis, axonal and dendritic growth, synaptogenesis, cell death, synaptic pruning, myelination, and gliogenesis (Dias et al., 2013).

The period immediately after birth has the greatest cerebral vulnerability to maternal deficiency of thiamine. Namely, any deficiency that occurs during the postnatal period would negatively impact neurological function (i.e., reflexes, abilities, and gait). Dias and colleagues found that rats who were breastfed by thiamine-deficient mothers had defective cognitive function because thiamine deficiency hinders neurological processes, such as synaptogenesis and axogenesis. Therefore, low levels of thiamine resulted in disturbances in critical neurological processes in rats, leading to cognitive deficits such as memory loss, uncoordinated movement, and language impairment.

Thiamine deficiency can cause disruptions to regions of the brain responsible for motor control. In studies with rats (Dias et al., 2013; Zhao et al., 2009), researchers found that thiamine deficiency during pregnancy and lactation causes atrophy and decreased density of pyramidal and granular cells of the hippocampus of rat puppies. All these dysfunctions persist into later life and could hinder the rats' motor function.

Moreover, several animal studies showed that thiamine deficiency can cause defects in certain areas of the brain that are crucial for proper metabolic function. For instance, low levels of thiamine might cause brain tissue injury by inhibiting metabolism in cerebral regions with higher metabolic demands and high thiamine consumption. The high rate of thiamine uptake by the blood–brain barrier reflects high cerebral demand for thiamine and the demand for its continuous supply for brain activity (Hiffler et al., 2016). In a study by Dias et al. (2013), cerebral enzyme activities that participate in energy metabolism (i.e., pyruvate and ketoglutarate dehydrogenase complex) significantly decrease in puppies from deficient mothers compared to puppies of control mothers (Dias et al., 2013). Similarly, a study by Zhao et al. (2009) showed that thiamine deprivation for 14 days in mice led to various deficiencies in transketolase (TKT), pyruvate dehydrogenase (PDH), and alpha-ketoglutarate dehydrogenase (αKGDH) activities in the cortex and hippocampus (Zhao et al., 2009) and TKT activity had the greatest reduction. TKT is essential because it serves as a cofactor of transketolase enzymes, PDH, and αKGDH, which are key enzymes involved in cell respiration. If any of these enzymes show reduction in activity, CNS cells cannot produce enough energy to perform neurological mechanisms that allow for neuron communication or CNS growth (i.e., axon growth). Hence, thiamine deficiency harms neurological function by causing significant defects in energy metabolism.

2.2.4. HUMAN STUDIES

Human studies have also demonstrated thiamine's impacts on infant neurodevelopment. For instance, Dias et al. (2013) claim that thiamine shortcoming during pregnancy and breastfeeding is directly related to cognitive impairment of the child. Based on demographic data from populations with underprivileged individuals, the researchers believe that poverty due to malnutrition is a crucial risk factor in the occurrence of thiamine shortcomings. In another study, Prado, and Dewey (2014) focused on the effects of early nutrient deficiency on long-term brain function, cognition, and well-being in infants from low- and middle-income countries. The researchers found that certain types of

nutritional deficiency, such as thiamine deficiency, can impair cognitive, motor, and socio-emotional abilities. Harel et al. (2017) also discovered that thiamine deficiency in infancy has long-term implications for gross and fine motor function and balance skills in childhood. Both Harel, Prado and colleagues conclude that thiamine plays a crucial role in normal motor development.

Additionally, thiamine deficiency can alter certain brain regions that are responsible for motor control. In a study by Dhir et al. (2019), the researchers performed MRI studies and found that mammillary bodies, basal ganglia, and frontal lobes were affected in children with thiamine deficiency. The mamillary bodies are components of the brain that are associated with recollective memory and transmit information about memory via the mammillothalamic tract (Peterson et al., 2021). The basal ganglia functions in inhibition of muscle tone, coordination of slow and sustained movements, organization of motor behavior or movement, and suppression of useless patterns of movement. Moreover, the frontal lobe is responsible for voluntary motor control.

Through animal studies, we could understand how thiamine deficiency plays a role in energy metabolism and neurological processes, such as axonogenesis, and relate that information to infants. With human studies, there are no studies that investigated thiamine's physiological role in infants, such as metabolism, but there is some evidence that showed thiamine deficiency affects brain structures responsible for motor development. While both animal and human studies demonstrated that low thiamine levels could hinder early neurodevelopment and body function, only a handful of studies thus far have directly assessed relationships in human infants between thiamine status and neurological development. This thesis aims to bolster existing literature regarding relationships between infants' thiamine status and both their physiological status shortly after birth, and their neurological development over the first year of life.

2.3. HAMMERSMITH NEUROLOGICAL EXAMINATIONS

Since nutrient deficiency appears capable of contributing to adverse effects on an infants' nervous system, neurological examinations can determine if there are delays in normal development and functions. Delays may be due to trauma during labor and delivery (I.e., decreased oxygen levels and high blood pressure), which result in neurological insults, or potentially to other causal factors such as thiamine deficiency.

Neurological examinations have been developed to understand the neurologic status of post-natal infants that were born at various times (full-term, late-term, etc.) and whether they had impairments in their nervous systems. There are several examinations that are utilized in clinical and research settings, such as the Touwen Infant Neurological Examination (TINE), the Amiel-Tison Neurological Assessment at Term (ANAT), and Hammersmith (Maitre et al., 2016). TINE assesses infants' posture and motility during sitting, standing, and walking (Hadders-Algra et al., 2009). It also evaluates infants' brainstem reactions, visuomotor function, muscle tone, and different reflexes. Additionally, ANAT is a set of three different instruments that measures axial motor activity (active tone), passive tone in limbs and arms, head growth and cranial sutures (Gosselin et al., 2005). It is used in clinical and research settings to identify children from 32 weeks to 6 years of age with mild to severe neuro-cranial signs that may benefit from early intervention (Gosselin et al., 2005).

This thesis will investigate the Hammersmith Neonatal Neurological Examination (HNNE) and the Hammersmith Infant Neurological Examination (I will collectively refer them as Hammersmith examinations). The Hammersmith examinations were originally

created by Dr. Lilly Dubowitz and Professor Victor Dubowitz in 1981, and updated by Dr. Eugenio Mercuri, in 1998 (Mercuri et al., 2015). These assessments were meant to be fast, practical, easy to perform, and include standardized scoring columns that contained definitions along with diagrams (see Appendix A and B). The examination's approach to evaluate an infant's neurological status is to categorize tasks (i.e., head posture) into certain categories (i.e., posture) to comprehend specific aspects of neurodevelopment. The scores from the categories are combined to establish the infant's overall neurological status across different neurodevelopmental domains (Mercury et al., 2015). These examinations tell us about which areas in the brain may contribute to an infant's performance on a neurological assessment. Namely, an infant's performance on these examinations can provide insight on how they are developing and where in the nervous system they exhibit defects in neurological development.

HNNE consists of 6 categories administered in the following order: tone, tone patterns, reflexes, spontaneous movements, abnormal signs, and behavior. It is performed on newborns from birth to 2 months old. Both assessments sum individual scores for each category to obtain both a subscore and an overall score representing an infant's neurological status. By comparison, HINE is a brief, standardized, and scorable clinical neurological examination administered to infants who are 2–24-months old. This examination consists of 34 items and six categories (tone, tone patterns, reflexes, spontaneous movements, abnormal signs, and behavior).

Many studies have utilized HINE and HNNE in different clinical groups of full term and preterm infants at different ages within the neonatal period. These studies primarily assess neurodevelopmental disabilities in term and preterm infants with no underlying health conditions. Researchers have also utilized the HINE to distinguish babies with nervous system disorders, such as cerebral palsy, from healthy individuals (Romeo et al., 2020). Additionally, a study by Venkata et al. (2020) used HNNE to compare neurodevelopmental disabilities in term versus preterm infants. They also tried to determine if they could use HNNE to predict cognitive dysfunction subsequently, at one year of age. Chin et al. (2018) evaluated the neurological status of late-preterm infants using the HNNE. They found that these infants were neurologically more immature than their term counterparts.

2.3.1. INFANT NEUROLOGICAL EXAMINATIONS IN RELATION TO THIAMINE DEFICIENCY

Researchers use Hammersmith examinations to assess infants born at different terms and to detect high risk of neurological disorders, such as cerebral palsy, at an early age. They are also used to detect significant delay with respect to developmental milestones (i.e., independent walking) in children with this disorder (Maitre et al., 2016; Romeo et al., 2020; Venkata et al., 2020; Chin et al., 2018).

To date, few studies have utilized Hammersmith or other neurological assessments, such as the Touwen Infant Neurological Examination (Hadders-Algra et al., 2009) and the Amiel-Tison Neurological Assessment at Term (Gosselin et al., 2005), in the context of micronutrient deficiency. A study by Kumar et al. (2018) investigated the associations of iron and folic acid with developmental milestones and found that deficiencies in those nutrients resulted in delays in neurodevelopment. In particular, the researchers evaluated infants' neurological statuses using the Trivandrum Development Screening Chart, a test that assesses cognitive and motor milestones in children, and a full systemic neurological examination that assessed various aspects of neurodevelopment (i.e., motor skills, sensory skills, reflexes, and cranial

nerves) (Kumar et al., 2018). However, very little is known about thiamine's role in human infant neurological development. Particularly, there are no studies that utilized Hammersmith in the context of thiamine deficiency.

2.3.2. RESEARCH GOAL

As mentioned above, there are very few studies or clinical applications examining relationships between infants' thiamine status and their HNNE/HINE scores. Hence, this thesis aimed to provide an initial attempt to fill this gap. In particular, the thesis research investigated the extent to which low-dose thiamine supplementation for lactating Cambodian mothers might affect their breastfed infants' neurological status, as measured by their Hammersmith scores on the HNNE and HINE.

This study took place in the context of a larger double-blind, four-parallel arm, randomized controlled trial. 335 healthy mother (18-45 years) and baby pairs from the Kampong Thom province of Cambodia were recruited as participants. Each mother-infant pair was assigned to one of four thiamine supplementation treatment groups: 0 mg (placebo), 1.2 mg (EAR), 2.4 mg (2 x EAR), and 10.0 mg (positive control). Mothers were asked to consume one capsule daily between 2 and 24 weeks postnatal. Additionally, maternal milk thiamine levels were assessed at various timepoints, the HNNE was performed when infants were 2 weeks post-natal, and the HINE was performed when infants were 12-, 24-, and 52-weeks post-natal.

This thesis investigated several specific questions regarding possible relations between maternal thiamine supplementation and infants' developmental outcomes, using the HINE as the primary measure of infants' neurocognitive development at 24 weeks (Endline). The three main research questions were:

1) to what extent did infants display progress in their HINE scores from 12- to 52-weeks?
2) to what extent were infants' growth metrics at 2 weeks (weight, head circumference, length) associated with their Hammersmith scores?
3) to what extent did low-dose maternal thiamine supplementation affect infants' HINE/HNNE scores?

For the first question, it was predicted that infants' HINE scores would display evidence for developmental progress from 12- through 52-weeks, even while controlling for infants' baseline neurological status via their HNNE scores. With the second question, infants' growth metrics at 2 weeks (weight, head circumference, length) would also be associated with their Hammersmith scores, both concurrently and at subsequent timepoints. Specifically, higher growth metrics at 2 weeks would be significantly correlated with higher Hammersmith scores at 2-, 12-, 24-, and 52-weeks post-natal. For the last question, it was hypothesized that low-dose maternal thiamine supplementation would benefit infants' neurological status based on previous evidence of thiamine's importance in neurological development. Thus, a dose-response relationship between maternal thiamine supplementation dose and infants' HINE scores at 24-weeks (Endline) and 52-weeks (One-Year Follow-up) would be predicted. Overall, the three questions investigated in this thesis would provide insight on thiamine supplementation as a potential treatment for improving neurodevelopment of infants who are at risk of thiamine deficiency.

3. METHODS

The research for this thesis complied with all IRB-requirements to ensure the safety of the participants. Ethical approval was obtained from the National Ethics committee for Health Research, Cambodia; Mount Saint Vincent

University Research Ethics Board, Canada; and the University of Oregon Institutional Review Board, USA.

3.1. PARTICIPANTS

Participants (335 pregnant women) were recruited through antenatal care visits and consultations with local village chiefs, elders, and health center staff. The pregnant women were advised and provided with a general overview of the research study. To be eligible for the study, the mother's most recent pregnancy had to be normal (i.e., no known chronic conditions, preeclampsia, gestational diabetes, etc.), and the infant was born without complications (I.e., low birth weight, tongue tie, cleft palate). Other criteria included: not taking or having taken thiamine-containing supplements over the past 4 months and not currently participating in any nutrition programs beyond normal care. Participants, research assistants, study investigators and data analysts were blinded to the randomized groups. Within each treatment group, women were asked to consume one capsule daily between 2 and 24 weeks postnatal.

3.2. HAMMERSMITH NEONATAL NEUROLOGICAL EXAMINATION (HNNE)

The Hammersmith Neonatal Neurological Examination (HNNE) was performed at 2 weeks, and it was modified and shortened relative to the original exam. The HNNE also provided insight about an infant's neurodevelopment by assaying infants' motor and sensory responses. In this study, the examination consisted of 5 categories that were administered in the following order (Mercuri, Ricci, Pane, & Baranello, 2005):

1) Tone and posture: posture, arm recoil, arm traction, leg recoil, leg traction, popliteal angle, head control (extensor and flexor tone), head lag, ventral suspension.
2) Reflexes: tendon reflex, suck/gag, palmar grasp, plantar grasp, placing, moro reflex.
3) Movements: quantity and quality of spontaneous movement, head raising prone.
4) Abnormal Signs: abnormal hand or toe postures, tremor, startle.
5) Orientation and Behavior: eye appearances, auditory orientation, visual orientation, alertness, irritability, consolability, cry.

The HNNE yielded "optimality" scores on a 1-5 scale. Scores of 1 and 5 were considered non-optimal while scores of 2, 3, and 4 were considered degrees of "optimal." Since none of the infants scored a '5' on any of the tasks, their scores from 1-4 represented a linear scale, and could be analyzed in that fashion. The total score was summed from all 4 subscale scores (see below for clarification about subscales).

3.3. HAMMERSMITH INFANT NEUROLOGICAL EXAM (HINE)

The Hammersmith Infant Neurological Examination (HINE) was performed at 2 weeks, 12 weeks, and 24 weeks postpartum. Both versions of the Hammersmith are brief, standardized, and scorable clinical neurological examinations that provide basic information about infants' neurological status through use of gentle touch and social interaction to evaluate infants' sensory and motor responses. Prior to the test, administrators were trained on how to perform the exam. See Appendices A and B for detailed information about the HINE and HNNE items and scoring.

This study performed a shortened version of the actual HINE. There were 12 items, and 4 categories with their corresponding items were performed in the following order:

1) Posture: head, trunk, hands
2) Movements: quantity and quality
3) Tone: scarf sign, passive shoulder, adductors, ankle dorsiflexion, and

ventral suspension
4) Reflex: arm protection and vertical suspension

Each item was scored individually (0, 1, 2, or 3); items within each category were summed to create the subscore and all items were added to produce an overall score of all individual items, which ranged from 0 to 78. Motor milestones (e.g., walking) and behavior states (e.g., emotional state) were documented as part of the assessment but they were not scored. If any asymmetry was detected (i.e., different scores for an infant's right versus left side), each side was scored and averaged as one score for that item.

3.4. MATERNAL THIAMINE-STATUS MEASUREMENTS

Maternal blood samples were collected at 2 and 24 weeks whereas infant blood samples were obtained at 24-weeks postnatal. Both samples were collected using EDTA-coated tubes. Human milk samples were collected using a battery-powered single breast pump at 2-, 4-, 12-, and 24-weeks postnatal. For analysis, mothers' venous blood samples were measured for erythrocyte transketolase, a marker for thiamine deficiency, and thiamine diphosphate concentrations (ThDP) at 2 weeks and 24 weeks postnatal. Milk samples were measured at the same ages for total milk thiamine concentrations. For infants, venous blood samples were also assayed for whole blood ThDP and erythrocyte transketolase at 24-weeks. In the thesis, only mothers' 2-week total milk thiamine levels were analyzed.

3.5. APPROACH TO ANSWERING RESEARCH QUESTIONS

This section would outline the plan for analyses. First, infants' progress in their HINE scores from 12- to 52-weeks would be investigated by performing a one-way ANOVA to determine if there are differences between groups.

Next, a 3 X 4 mixed-design ANCOVA (with baseline HNNE scores as the covariate) would be run to analyze infants' total raw HINE scores to determine the relationship between low-dose maternal thiamine supplementation and infants' HNNE/HINE scores. Pearson correlations would be performed between HNNE scores and HINE scores at each time point.

Finally, infants' Z-scored growth metrics (in relation to World Health Organization norms) at the baseline measurement timepoint (HNNE 2 weeks) were examined to determine how infants were faring at baseline. Then, the association of infants' anthropometrics at 2 weeks with their Hammersmith scores by conducting Pearson correlations between each growth metric (length, head circumference, and weight) and HNNE score were analyzed

Lastly, two multiple regressions to explore the collective association of four predictors -- baseline Z-scored weight, mothers' total milk thiamine levels measured at baseline (a proxy for infants' prenatal access to thiamine), baseline HNNE scores, and maternal thiamine supplementation dose (0, 1.2, 2.4, 10mg) – were utilized with infants' 24-week HINE scores, and with infants' 52-week HINE scores. These multiple regression models had the advantage of providing a) a potentially more sensitive test of maternal thiamine supplementation because they treated it as a scalar variable (as opposed to ANCOVA, which treated it as a categorical variable), and b) information regarding possible associations of other variables (e.g., 2-week Z-scored weight, mothers' 2-week total milk thiamine level, maternal thiamine supplementation dosage) with neurological change (assessed at 24- and 52-weeks), given that HNNE baseline scores were auto-regressed in the analyses.

4. RESULTS

This study investigated several key questions, including possible relationships between maternal thiamine supplementation and indices of infants' growth, such as their weight, height, and head circumference, as well as possible benefits of maternal thiamine supplementation for infants' Hammersmith scores.

4.1. PRELIMINARY ANALYSES

An important preliminary issue concerned the possibility that infants in the four thiamine treatment groups might have shown differences in their neurocognitive function (measured by the HNNE) already at the baseline measurement timepoint despite randomization to treatment group. However, no such differences were observed: A one-way ANOVA examining 2-week HNNE scores revealed no significant main effect of treatment group, F (3,331) = 0.55, p=0.65.

Distributions of the Hammersmith scores at each timepoint were examined. In Figure 1, the 2-week HNNE baseline showed a normal distribution with scores in the middle of the scoring range. Most of the infants had moderate HNNE scores while a few of them had high or low scores (i.e., 31 or 17) meaning most of the infants had mid-range scores, indicating moderate neurological health. HINE scores increasingly shifted towards the high end of the Hammersmith scale from 12 weeks to 52 weeks, indicating neurological function improving with age for infants in the sample overall. At the same time, HINE distributions became increasingly negatively skewed as infants' age increased. Departures from normality were obvious when infants were 24 and 52 weeks, with a few infants displaying HINE scores that were much lower than average. This pattern points to a handful of infants within the sample increasingly falling behind in neurological development.

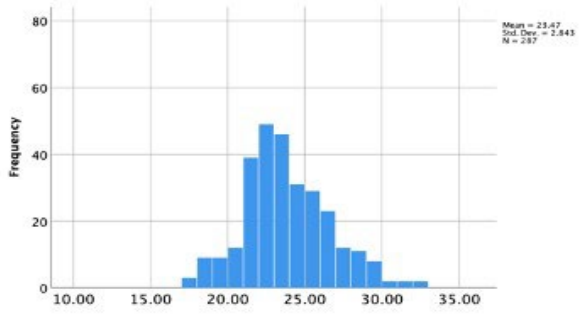


Figure 1A: The frequency of HNNE (2-week baseline) and HINE (12-, 24-, and 52weeks) scores at the four measurement timepoints. Baseline (2 weeks): Mean= 23.47, Std. Dev= 2.543, N=287.

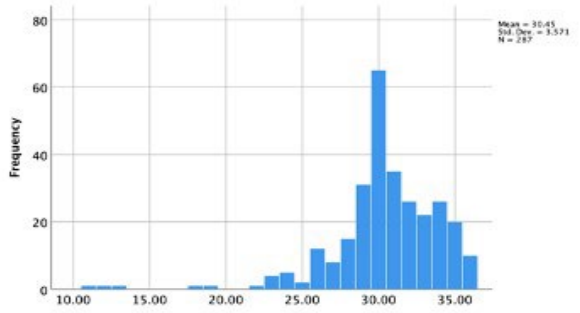


Figure 1B: Midline (12 weeks): Mean 30.45, Std Dev.= 3.571, N=287.

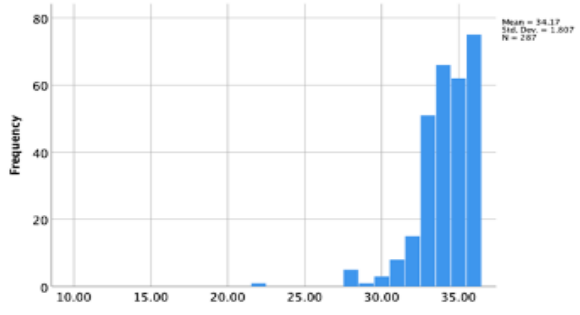


Figure 1C: Endline (24 weeks): Mean= 34.17, Std. Dev= 1.807, N=287.

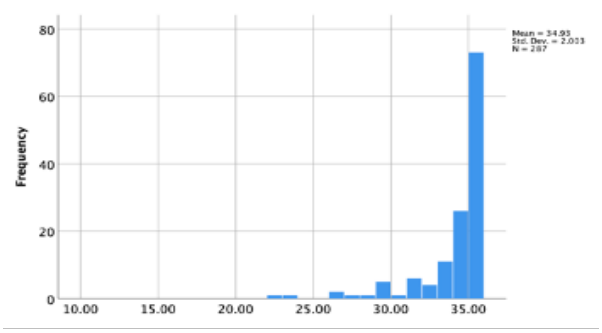


Figure 1D: Follow-up (52 weeks): Mean= 34.93, Std Dev.= 2.033, N=287,

Infants' anthropometrics at the baseline measurement timepoint were examined to gain a sense of how infants were faring in terms of growth at baseline, and in relation to possible differences at baseline among treatment groups (see Table 1).

Table 1: Infants' mean Z-scored weight, head circumference, and length at 2 weeks in relation to WHO norms (standard deviations in parentheses).

	Total N=335	Placebo (0 mg) n=83	1.2 mg n=86	2.4 mg n=81	10 mg n=85
Z-weight	-0.52 (0.97)	-0.40 (0.95)	-0.50 (0.96)	-0.59 (0.88)	-0.58 (1.07)
Z-head circumference	-0.72 (1.02)	-0.59 (1.14)	-0.77 (0.98)	-0.81 (0.99)	-0.73 (0.96)
Z-length	-0.62 (1.02)	-0.52 (0.98)	-0.66 (1.11)	-0.69 (1.01)	-0.63 (1.01)

Based on Table 1, infants' Z-scored growth metrics indicated substantial growth reductions relative to WHO norms when measured at 2 weeks. This was not unexpected but underscores a range of factors affecting infants' growth in Cambodia. A series of one-sample t-tests comparing the three growth metrics at 2 weeks to 0 (the expected mean for WHO norms) revealed that infants in the sample scored significantly below the WHO-normed mean on all three metrics, *t*'s < -9.76, *p*'s < .000. A series of one-way between-subject ANOVAs examining possible treatment group differences for the three different growth metrics (Z-scored weight, head circumference, length) at 2-weeks were also conducted. The exception to the ANOVAs was that no such differences would be statistically significant due to random assignment to treatment groups. These analyses confirmed (all p's > 0.165) that no statistically significant differences occurred in any of the three growth metrics for infants in the four different treatment groups.

4.2. DEVELOPMENTAL PROGRESS IN HAMMERSMITH SCORES

The first analysis of Hammersmith scores focused on two questions:

a) the extent to which infants' HINE scores displayed increases with development
b) b) the extent to which maternal thiamine supplementation dosage influenced HINE scores.

These questions were investigated via a 3 X 4 mixed-design ANCOVA examining infants' total raw HINE scores with timepoint (12, 24, and 52-weeks) as the within-subjects, repeated-measures variable, treatment group (0, 1.2, 2.4, and 10 mg daily thiamine) as the between-subjects variable, and baseline (2 week) HNNE score as a covariate (to control for starting differences in infants' neurological status). According to the means and standard deviations in Table 2, the ANCOVA analysis revealed a significant main effect of timepoint, F (2, 564) =23.96, p =.000, indicating that infants' HINE scores showed systematic development with age.

Table 2: Mean HNNE scores at 2 weeks and mean HINE scores at other timepoints in the study (standard deviations in parentheses).

	Total N=335	Placebo (0 mg) n=83	1.2 mg n=86	2.4 mg n=81	10 mg n=85
HNNE 2 weeks	9.42 (1.71)	9.62 (1.53)	9.29 (1.79)	9.25 (9.88)	9.52 (1.62)
HINE 12 weeks	30.41(3.54)	30.89 (2.93)	30.47 (2.94)	30.03 (4.22)	30.24 (3.94)
HINE 24 weeks	34.18 (1.80)	34.26 (1.68)	34.22 (1.82)	33.86 (2.17)	34.38 (1.47)
HINE 52 weeks	34.96 (1.95)	35.04 (1.77)	35.06 (1.88)	34.91(2.12)	34.85 (2.03)

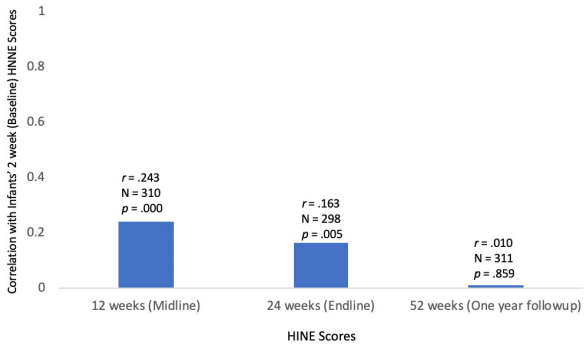
4.3. MATERNAL THIAMINE SUPPLEMENTATION ON HAMMERSMITH

SCORES

The ANCOVA revealed neither a significant main effect of treatment group, F (3, 282) = 1.12, p = .34, nor a significant timepoint by treatment group interaction, F (6,564) = .45, p =.84, indicating that maternal thiamine supplementation had no systematic effect on infants' HINE scores at any of the timepoints measured. However, the ANCOVA did reveal a significant effect of the covariate—baseline (2 week) HNNE scores—on infants' average HINE score across the three timepoints, F (1,282) = 15.20, p = .000. At the same time, a significant timepoint by covariate interaction indicated that this relationship depended on timepoint, F (2,564) = 8.46, p = .000. Figure 2 displayed the timepoint-related changes with respect to baseline HNNE scores, with the strongest relationship occurring at earlier timepoints (e.g., 12-weeks) and waning at later timepoints (e.g., 24- and 52-weeks), with a non-significant relationship at the 52week follow-up. These analyses show HNNE was associated with neurocognitive status only at earlier ages (12 and 24 weeks postpartum). Conversely, HNNE scores were not related with neurodevelopment of older infants (52 weeks postpartum).

The ANCOVA revealed no effect of thiamine on infants' Hammersmith scores. So, a potentially more sensitive analysis was conducted to examine this issue. In this new ANCOVA, all three thiamine supplementation conditions were collapsed (i.e., 1.2, 2.4, and 10 mg) to compare effects of thiamine supplementation (at any dose) relative to placebo (0 mg). Other variables in the analysis were the same as the previously reported ANCOVA (i.e., timepoint and HNNE baseline as covariate). However, consistent with the pattern of findings from the previous ANCOVA, no significant main effect nor interactions emerged involving maternal thiamine supplementation.

Figure 2: Correlations between infants' 2-week (Baseline) HNNE scores and infants' HINE scores at subsequent timepoints.



4.4. CORRELATIONAL ANALYSES

Also of interest was the extent to which infants' baseline anthropometrics (e.g., Z-scored weight, head circumference, and length) and their Hammersmith scores at 2-, 12-, 24-, and 52-weeks were related, described in Tables 3 and 4. In Table 3, Pearson correlations revealed statistically significant positive relationships among all anthropometric measures at all timepoints.

Table 3: Correlations between infants' neurological scores on the Hammersmith at 2-, 12-, 24-, and 52-weeks and infants' anthropometric growth scores at 2-weeks as measured by standardized length, weight, and head circumference. The data presented determined whether an infant's HNNE/HINE score is related to their 2-week anthropometric measures. Note: Standardized (z-score) measures of infant growth are based on World Health Organization norms. *p < .05; **p< .01; ***p< .001

	Weight	Head circumference	Length
2 weeks HNNE (Baseline)	0.152**	0.119*	0.178**
12 weeks HINE (Midline)	0.225***	0.155**	0.216***
24 weeks HINE (Endline)	0.139*	0.104	0.147*
52 weeks HINE (One Year Follow-up)	0.05	0.04	0.062

With Table 4, HNNE at 2 weeks (Baseline) and HINE scores at 12- and 24-weeks were each significantly positive related, but none of these were significantly related to 52-week (One Year Follow-up) HINE scores. Lastly, 2-week (Baseline) anthropometrics (Z-scored weight, head circumference, and length) were

significantly positively associated with 2-week (Baseline), 12-week (Midline), and 24-week (Endline) Hammersmith scores, but none of the anthropometrics was significantly associated with HINE scores at 52-weeks (One Year Follow-up).

Table 4: Correlations between infant's 2-week HNNE baseline and 12 weeks, 24 weeks, and 52 weeks HINE. (** denotes significance at the 0.01 level). The data in this table determined whether HNNE or earlier HINE scores were related to later HINE scores. *p < .05; **p< .01; ***p< .001

	2 weeks HNNE (Baseline)	12 weeks HINE (Midline)	24 weeks HINE (Endline)
2 weeks HNNE (Baseline)	1	---	---
12 weeks HINE (Midline)	0.243**	1	---
24 weeks HINE (Endline)	0.163**	0.329**	1
52 weeks HINE (One Year Follow-up)	0.010	0.041	0.053

4.5. REGRESSION MODELS

Lastly, two multiple regression analyses were conducted to examine the extent to which several predictors were systematically associated with a) 24-week HINE scores, and b) 52-week HINE scores. These regressions had the advantage of making it possible to test for a dose-response relationship between thiamine treatment group and Hammersmith scores, given that supplementation dose was treated as a scalar variable (0, 1.2, 2.4, or 10 mg) in the model. As well, in these regression models, an earlier timepoint (2-week HNNE) of the dependent variable (24 weeks HINE) was controlled, meaning the models were testing change in neurological level from baseline to the later timepoint.

The predictor variables included were:

a) infants' z-scored baseline weight (a proxy for the quality of infants' intra-uterine environment)
b) mothers' total milk thiamine levels at baseline (a proxy for infants' access to thiamine prenatally)
c) baseline HNNE scores
d) the thiamine supplementation treatment group to which mothers and infants had been assigned.

Regarding the 24-week timepoint, the multiple regression shown in Table 7 revealed an overall significant model ($F = 3.236$, $p = 0.013$), with $R^2 = 4.2\%$. Individual beta coefficients were statistically significant for baseline z-scored weight (beta = 0.123, $t = 2.086$, $p = 0.013$) and baseline HNNE (beta = 0.135, $t = 2.312$, $p = .013$). These findings indicated that baseline weight was associated with 24-week Hammersmith scores, even while controlling for baseline Hammersmith, and that baseline Hammersmith was associated with 24-week Hammersmith, further confirming correlational findings reported earlier. None of the other individual beta-coefficients were statistically significant. Thus, regarding infants' access to thiamine, neither maternal thiamine dosage during the clinical trial nor mothers' baseline total milk thiamine level were significantly associated with infants' 24-week neurological performance on the Hammersmith.

The same multiple regression model yielded a different outcome for infants at the 52-week follow-up timepoint. As seen in Table 5, the regression model was nonsignificant ($F = 1.45$, $p = 0.219$, $R^2 = 1.7\%$). The only predictor variable with an individually significant beta-coefficient was maternal total milk thiamine level at baseline (beta = 0.12, $t = 2.05$, $p = 0.042$). This finding suggested that infants' pre-natal access to thiamine was significantly associated with change in their neurological function as assessed by Hammersmith at 52 weeks. This stood out as the one finding within this dataset hinting at a possible relationship between

infants' thiamine status and their developing neurological function (as measured at 52 weeks).

Table 5: Regression analyses of 2-week HNNE, Z-weight 2 weeks, treatment group thiamine levels, and 2 wees milk thiamine levels at 24 weeks and 52 weeks HINE. Statistical significant is denoted by * ($p < 0.05$).

	24 Week Outcomes					52 Week Outcomes				
Predictors	B	SE	*β*	*t*	95% CI	B	SE	*β*	*t*	95% CI
HNNE-2 weeks	.09	.04	.14	2.31*	[.01,.16]	.01	.04	.01	.14	[-.07, .08]
Z-weight-2 weeks	.23	.11	.12	2.09*	[.01,.44]	.10	.12	.05	.88	[-.13, .33]
Treatment group thiamine levels	.03	.03	.05	.87	[-.03,.08]	-.02	.03	-.03	-.53	[-.07, .04]
Milk thiamine-2 weeks	.00	.00	.00	.09	[-.00,.00]	-.003	.002	.12	2.05*	[.00, .01]
	R= 0.042, F (4, 293) = 3.24, p=0.013					R=0.017, F (4, 306) = 1.45, p=0.219				

These regression models were rerun with maternal thiamine supplementation groups collapsed together (thus the variable was dummy-coded as 0 for placebo control group vs. 1 for any level of thiamine supplementation) to increase the sensitivity of detecting a possible thiamine effect. The pattern of results from these models was the same as the findings from the previously reported regressions, meaning that recoding the maternal thiamine supplementation did not change the outcome of these analyses.

5. DISCUSSION

The primary purpose of this thesis was to investigate the extent to which maternal thiamine supplementation benefitted exclusively breastfed, rural Cambodian infants' neurological development, as measured by the Hammersmith Neurological

Examinations (HNNE and HINE). It was predicted that infants would exhibit developmental progress on the Hammersmith from 12 to 52 weeks, and that maternal thiamine supplementation would have a dose-response effect on infants' neurological function. Specifically, infants whose mothers received higher levels of thiamine supplementation would show higher Hammersmith scores. Additionally, the extent to which infants' growth at baseline score (2 weeks postnatal) was associated with their Hammersmith scores were examined. It was hypothesized that infants with higher growth metrics at 2 weeks would display higher Hammersmith scores at subsequent developmental timepoints. Other predictors, such as maternal milk thiamine levels at 2 weeks, associated with 24 weeks HINE and 52 weeks HINE were explored. Since most of the analyses showed a nonsignificant relationship between thiamine group and infants' Hammersmith scoring, the finding about 2 weeks maternal milk thiamine predicting 52 weeks HINE was surprising.

5.1. ANTHROPOMETRICS AT 2 WEEKS AND HAMMERSMITH SCORES

Infants' 2-week growth metrics showed delays relative to WHO growth norms, which was not unexpected given previous findings for infants born in rural Cambodia (Whitfield, et al., 2017). Correlational analyses were performed to investigate the extent to which 2-week growth metrics were positively associated with subsequent Hammersmith scores. These analyses confirmed that infants' growth (measured by Z-scored weight, head circumference, and length) were significantly positively correlated with infants' Hammersmith scores at 2-, 12-, and 24-weeks. That is, when infants were larger regarding their growth metrics, they tended to display higher Hammersmith scores at the first three measurement timepoints. By the 52-week follow-up timepoint, these relationships had waned and were no longer statistically significant. Therefore, these findings underscore the potential value of early growth metrics for predicting infants' neurocognitive trajectories in their first 6 months of life.

5.2. MATERNAL THIAMINE AND

HAMMERSMITH SCORES

Analysis of variance revealed that infants' Hammersmith scores showed significant improvements with development. Although most infants performed increasingly well on the HINE, there were a handful who had HINE scores that were strikingly lower than average. Examination of distributions at each timepoint revealed that some infants had HINE scores below 25 at 12 weeks (the average HINE score at that time point was 30.41). When timepoint progressed to 52 weeks, the frequency of infants who had low HINE scores became even more obvious. The negatively skewed distributions indicated that a handful of infants were displaying increasingly obvious delays in neurological development.

In the analysis of variance, the thiamine supplementation treatment group to which infants had been randomly assigned had no significant effect on their Hammersmith scores at any developmental timepoint. Thus, the hypothesis regarding maternal thiamine supplementation benefitting infants' neurological development – as measured by the Hammersmith -- was not supported by the data.

Additional exploratory analyses were performed in relation to the dose response hypothesis. Particularly, the hypothesis was examined using a regression approach in addition to the analysis of variance approach already described, because a regression model considers the scalar level of maternal thiamine supplementation dosage. The regression approach thus provides a more sensitive test of the hypothesized dose-response relationship of maternal thiamine supplementation to infants' Hammersmith outcomes than analysis of variance, which only treats thiamine supplementation group as a categorical variable. Several predictor variables were included in addition to maternal thiamine supplementation treatment group to the regression model, including infants' 2-week Z-scored weight (as a proxy for the quality of their intra-uterine environment), their 2-week HNNE score (to control for baseline Hammersmith scores), and maternal 2-week total milk thiamine levels (as a proxy for infants' prenatal access to thiamine). When this regression model was conducted to examine 24-week Hammersmith scores, the model overall was statistically significant, and that both infants' 2-week Z-scored weight and their 2-week HNNE scores were significantly associated with their 24-week HINE scores. However, neither maternal supplementation treatment group nor 2-week maternal total milk thiamine levels were significantly associated with their 24-week HINE scores. These findings again did not support the initial prediction that maternal thiamine supplementation would show a dose-response relationship to infants' neurological function as measured by the Hammersmith.

In contrast to these findings, the same regression model conducted in relation to Hammersmith scores from the 52-week follow-up measurement timepoint revealed a quite different picture. Unlike at 24-weeks, neither 2-week Z-scored weight nor 2week HNNE scores were systematically associated with 52-week Hammersmith scores. The treatment group was also not significantly associated with 52-week Hammersmith scores. Among other things, these findings further disconfirmed the dose-response hypothesis regarding maternal thiamine supplementation. Yet strikingly, in this analysis, maternal 2-week total milk thiamine levels displayed a significant relationship to infants' 52-week HINE scores. This was the only sign within this thesis dataset that infants' early that showed that pre-supplementation access to thiamine (prenatally and/or during their first two weeks of life) mattered for their subsequent neurological development. Maternal milk thiamine at 2 weeks baseline may have predicted

52-week HINE, but not 24-week HINE, because certain relevant neurological functions might not emerge in Hammersmith testing until 52 weeks. However, it is important to underscore that this regression analysis did not reach statistical significance. Given this, it is important to interpret this finding with caution.

5.3. BROADER IMPLICATIONS

These thesis findings build on previous studies utilizing the Hammersmith Neurological Examinations by applying these neurological assessments in a nutritional setting. The results add to the literature regarding thiamine's physiological effects on human development.

The findings were consistent with previous evidence (Whitfield et al., 2017) that many infants growing up in rural Cambodia experience delayed growth (at least in relation to WHO norms). This is a concern for numerous reasons, but based on the findings from some statistical analyses, early growth parameters were associated with neurocognitive development. Infants' early growth metrics (operationalized as Z-scored weight, head circumference, and length measured at 2 weeks postnatal in the present study) were related to their subsequent Hammersmith scores up through 24-weeks of age. These findings point to the importance of continuing efforts to better support maternal and fetal health in the larger region of which Cambodia is a part.

Moreover, this thesis provided the first investigation ever to examine possible relationships between infants' access to thiamine via maternal supplementation and their neurological function as measured by the Hammersmith. For this reason, the finding that Hammersmith scores were apparently unaffected by maternal thiamine supplementation is noteworthy. However, this finding is also somewhat puzzling, as discussed below. Further research will be necessary to investigate the many unanswered questions that arise in relation to this thesis's findings.

5.4. LIMITATIONS

There is considerable confidence that the Hammersmith was an appropriate instrument to utilize as a measure of infant neurological function for the present study. For example, previous research (e.g., Romeo, et al., 2020) indicates that the Hammersmith Neurological Examination is informative about neurological delay in early infancy even when infants do not have severe neurological dysfunction, such as cerebral palsy. At the same time, one of the possible limitations in this thesis was that modified versions of the two forms (HNNE and HINE) of the Hammersmith Neurological Examination were used. For instance, the cranial nerve function test was not included in the HINE. Some of these items could indicate an infant's sensory (i.e., smell, hearing, taste) and motor (i.e., eye and facial movement) skills. Since cranial nerves and some other tests, such as lateral tilting, were excluded from the HINE measures utilized in this study, the infant's overall HINE scores may not have reflected their entire neurological status. To the extent that the excluded items are important to overall HINE scores, the tests that determined thiamine supplementation's influence on HINE scores might have been insensitive to such effects.

Another possible limitation of the present study was the fact that it wasn't possible to ascertain the degree of reliability in the researchers' Hammersmith scoring. As is typical in the field, the Hammersmith was scored live by an observing researcher while another researcher worked directly with infants, and these sessions were not videotaped. Thus, the degree to which Hammersmith scores in this study may have been affected by researcher implementation variability and other factors affecting scoring reliability isn't known.

Lastly, it is important to recognize the possibility that maternal thiamine supplementation might have revealed an influence on infants' neurological function had the randomized controlled trial a) included higher dosages of thiamine than the low dose supplementation undertaken in this research (the highest daily dose was 10mg thiamine), b) begun either during or before pregnancy, and/or c) continued beyond 24-weeks post-natal. Future research will be necessary to provide information on these important issues.

5.5. FUTURE DIRECTIONS

The findings from the thesis raise several questions for future investigation. First, there is a disconnect between the thesis findings and other findings recently reported for the results of the larger dataset arising from the same randomized, controlled trial. These previous studies documented a statistically significant dose-response relationship between maternal thiamine supplementation and a) infants' scores on the language subscales of the Mullen Scales of Early Learning (MSEL) (Measelle, et al., 2021) and b) infants' attentional response to infant-directed speech (Baldwin, et al., under review). These findings point to benefits of such supplementation for infants' neurocognitive development. Given these findings, it might seem surprising that maternal thiamine supplementation did not appear to have a similar beneficial effect on infants' performance on the Hammersmith measure of neurological development.

One possible explanation for the discrepancy in findings could be that benefits of thiamine supplementation are pronounced for language development, which the Hammersmith does not measure. Consistent with this possibility, Measelle and colleagues found that maternal thiamine supplementation did not show a dose-response benefit for infants' performance on the MSEL fine- and gross-motor subscales; that is, the supplementation benefit was largely limited to the MSEL language subscales. Relatedly, differences between this thesis's findings and others from the same sample may have occurred because the Hammersmith primarily assesses movement and motor skills whereas MSEL and the infant-directed speech task measure language abilities. Taken together, the prior findings and the present findings appear to provide growing evidence that thiamine supplementation during early infancy is particularly impactful for infants' developing language functions.

Although these analyses disconfirmed the hypothesis that maternal thiamine supplementation would show a dose-response relationship to neurological development, as measured by Hammersmith scores, a lone finding hinted that infants' prenatal access to thiamine might matter for Hammersmith scores downstream at 52-weeks. Specifically, maternal total milk thiamine levels assayed at 2 weeks postnatal – a proxy for infants' prenatal access to thiamine -- were significantly associated with infants' 52week HINE scores, while controlling for treatment group, Z-scored weight, and 2-week baseline HNNE scores.

There is strong reason for caution in the interpretation of this finding. The finding arose from an exploratory regression analysis that revealed a nonsignificant model overall and is the only finding within this thesis that pointed to a possible impact of maternal thiamine on infants' Hammersmith scores. The finding warrants further investigation, however, both to discover whether it replicates, and to examine in a more direct way the extent to which infants' prenatal access to thiamine impacts their subsequent neurological development.

It is also worthy of note that the finding in this thesis of a significant relationship between maternal total milk thiamine levels at 2 weeks

and Hammersmith scores at 52 weeks meshes to some degree with findings from Measelle, et al. (2021) for this same sample. Measelle and colleagues documented a statistically significant association between 2-week maternal total milk thiamine levels and infants' fine-motor MSEL sub-scale scores and their MSEL language sub-scale scores. However, the relationship was statistically significant at 24 weeks but not at the 52-week follow-up timepoint in the Measelle et al. findings. The association between 2-week total milk thiamine levels and 52-week Hammersmith scores also echoes a finding reported by Fattal-Valevski and colleagues (2009). They observed that Israeli infants who had earlier been affected by thiamine deficient formula subsequently displayed delays in independent walking, which is a skill that tends to emerge normatively at about 52 weeks of age (Fattal-Valevski et al., 2009). Overall, these small convergences in findings across studies further underscore the need for continued investigation of the implications of infants' prenatal thiamine access for their subsequent neuro-cognitive development, especially in relation to motor and language development. Such investigation will benefit from initiation of new research in which maternal thiamine supplementation is begun during the prenatal period, and potentially continued beyond the 24-week timepoint (at which supplementation ceased in the present study).

Lastly, an important future direction will be to include additional neurological probes beyond the Hammersmith. Inclusion of other neurological measures will make it possible to assess the degree to which the present findings are robust across multiple neurological instruments.

6. CONCLUSIONS

In the present study, breast-fed Cambodian infants showed marked delays in growth metrics relative to WHO norms. Moreover, their growth metrics were associated with their neurological function during early infancy, as measured by the Hammersmith Neurological Examination. This underscores the importance of interventions to protect infants' health and growth in the Southeast Asia region.

Low-dose maternal thiamine supplementation did not appear to affect infants' Hammersmith scores in this study. Given that the Hammersmith primarily probes motor function, this may indicate that motor development is not a primary locus of benefit from maternal thiamine supplementation. Other accounts of the findings are also possible, however, raising the need for further investigation of these important developmental issues.

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APPENDICES

APPENDIX A: HNNE SCORING RUBRIC AND PROCEDURE

TONE AND POSTURE

NAME:_____, CODE:_____, SEX:_____, RACE_____,
D.O.B.:_____, D.O.E.:_____, AGE:_____, G.A.:_____, BW:_____,

Tone						DATE	AGE M
POSTURE Infant supine, look mainly at position of legs but also note arms. *score predominant posture*	Arms and legs extended or very slightly flexed	Legs slightly flexed	Leg well-flexed but not adducted	Leg well flexed and adducted near abdomen	Abnormal posture: a) opistotonus		
ARM RECOIL Take both hands, quickly extend arms parallel to the body. Count to three. Release. Repeat ×3	Arms do not flex	Arms flex slowly; not always; not completely	Arms flex slowly; more complete	Arms flex quickly and completely	Arms difficult to extend; snap back forcefully		
ARM TRACTION Hold wrist and pull arm upwards. Note flexion at elbow and resistance while shoulder lifts off table. *Test each side separately*	Arms remain straight; no resistance R L	Arms flex slightly or some resistance felt R L	Arms flex well till shoulder lifts, then straighten R L	Arms flex at approx <100° and maintained as shoulder lifts R L	Flexion of arms <100°; maintained when body lifts up R L		
LEG RECOIL Take both ankles in one hand, flex hip+knees. Quickly extend. Release. Repeat ×3	No flexion ← →	Incomplete or variable flexion	Complete but slow flexion	Complete fast flexion	Legs difficult to extend; snap back forcefully		
LEG TRACTION Grasp ankle and slowly pull leg upwards. Note flexion at knees and resistance as buttocks lift. *Test each side separately*	Legs straight – no resistance R L	Legs flex slightly or some resistance felt R L	Legs flex well till bottom lifts up R L	Knee flexes remains flexed when bottom up R L	Flexion stays when back + bottom up R L		
POPLITEAL ANGLE Fix knee on abdomen, extend leg by gentle pressure with index finger behind the ankle. Note angle at knee. *Test each side separately*	180° R L	~150° R L	~110° R L	~90° R L	<90° R L		
HEAD CONTROL (1) ***(extensor tone)*** Infant sitting upright; hold at shoulder. Let head drop forward.	No attempt to raise head	Infant tries: effort better felt than seen	Raises head but drops forward or back	Raises head: remains vertical; it may wobble			
HEAD CONTROL (2) ***(flexor tone)*** Infant sitting upright; hold at shoulder. Let head drop backward.	No attempt to raise head	Infant tries: effort better felt than seen	Raises head but drops forward or back	Raises head: remains vertical; it may wobble	Head upright or extended; cannot be passively flexed		
HEAD LAG Pull infant to towards sitting posture by traction on both wrists and support head slightly. Also note arm flexion	Head drops & stays back	Tries to lift head but it drops back	Able to lift head slightly	Lifts head in line with body	Head in front of body		
VENTRAL SUSPENSION Hold infant in ventral suspension; observe curvature of back, flexion of limbs and relation of head to trunk.	Back curved, head and limbs hang straight	Back curved, head ↓, limbs slightly flexed	Back slightly curved, limbs	Back straight, head in line, limbs flexed	Back straight, limbs above body		

REFLEXES

Reflexes	Absent	Felt, not seen	Seen	↑ Exaggerated↓	Clonus
TENDON REFLEX Test biceps, knee and ankle jerks.					
SUCK/GAG Little finger into mouth with pulp of finger upwards.	No gag/no suck	Weak irregular suck only: No stripping	Weak regular suck Some stripping	Strong suck: (a) irregular (b) regular Good stripping	No suck but strong clenching
PALMAR GRASP Put index finger into the hand and gently press palmar surface. Do not touch dorsal surface. *Test each side separately*	No response R L	Short, weak flexion of fingers R L	Strong flexion of fingers R L	Strong finger flexion, shoulder ↑ R L	Very strong grasp; infant can be lifted off couch R L
PLANTAR GRASP Press thumb on the sole below the toes. *Test each side separately*	No response R L	Partial plantar flexion of toes R L	Toes curve around the examiner/s finger R L		
PLACING Lift infant in an upright position and stroke the dorsum of the foot against a protruding edge of a flat surface. *Test each side separately*	No response R L	Forsiflexion of ankle only R L	Full placing response with flexion of hip, knee & placing sole on surface R L		
MORO One hand supports infantis head in midline, the other the back. Raise infant to 45° and when relaxed let his head fall through 10° . Note if jerky. Repeat ×3	No response or opening of hands only	Full abduction at shoulder and extension of the arms; no adduction	Full abduction but only delayed or partial adduction	Partial abduction at shoulder and extension of arms followed by smooth adduction	• No abduction or adduction; • Only forward extension of arms from the shoulders • Marked adduction only or

MOVEMENTS

SPONTANEOUS MOVEMENT (quantity) Watch infant lying supine.	no movement	sporadic and short isolated movements	frequent isolated movements	frequent generalized movements	continuous exaggerated movements		
SPONTANEOUS MOVEMENT (quality) Watch infant lying supine.	only stretches	stretches and random abrupt movements; some smooth movements	fluent movements but monotonous	fluent alternating movements of arms + legs; good variability	• cramped, synchronized; • mouthing • jerky or other abnormal movements		
HEAD RAISING PRONE Infant in prone, head in midline.	no response	infant rolls head over, chin not raised	infant raises chin, rolls head over	infant brings head and chin up	infant brings head up and keeps it up		

ABNORMAL SIGNS

ABNORMAL HAND OR TOE POSTURES		hands open, toes straight most of the time	intermittent fisting or thumb adduction	continuous fisting or thumb adduction; index finger flexion, thumb opposition	continuous big toe extension or flexion of all toes		
TREMOR		no tremor, or tremor only when crying or only after Moro reflex	tremor occasionally when awake	frequent tremors when awake	continuous tremors		
STARTLE	no startle even to sudden noise	no spontaneous startle but reacts to sudden noise	2-3 spontaneous startles	more than 3 spontaneous startles	continuous startles		

ORIENTATION AND BEHAVIOR

EYE APPEARANCES	does not open eyes		full conjugated eye movements	*transient* • nystagmus • strabismus • roving eye movements • sunset sign	*persistent* • nystagmus • strabismus • roving eye movements abnormal pupils		
AUDITORY ORIENTATION Infant awake. Wrap infant. Hold rattle 10 to 15 cm from ear.	no reaction	auditory startle; brightens and stills; no true orientation	shifting of eyes, head might turn towards source	prolonged head turn to stimulus; search with eyes; smooth	turns head (jerkily, abruptly) & eyes towards noise every time		
VISUAL ORIENTATION Wrap infant, wake up with rattle if needed or rock gently. Note if baby can see and follow red ball (B) or target (T).	does not follow or focus on stimuli B T	stills, focuses, follows briefly to the side but loses stimuli B T	follows horizontally and vertically; no head turn B T	follows horizontally and vertically; turns head B T	follows in a circle B T		
ALERTNESS *Tested as response to visual stimuli* (B or T).	will not respond to stimuli	when awake, looks only briefly	when awake, looks at stimuli but loses them	keeps interest in stimuli	does not tire (hyper-reactive)		
IRRITABILITY In response to stimuli.	quiet all the time, not irritable to any stimuli	awakes, cries sometimes when handled	cries often when handled	cries always when handled	cries even when not handled		
CONSOLABILITY Ease to quiet infant.	not crying; consoling not needed	cries briefly; consoling not needed	cries; becomes quiet when talked to	cries; needs picking up to be consoled	cries; cannot be consoled		
CRY	no cry at all	whimpering cry only	cries to stimuli but normal pitch		High-pitched cry; often continuous		

APPENDIX B: HINE SCORING RUBRIC AND PROCEDURE

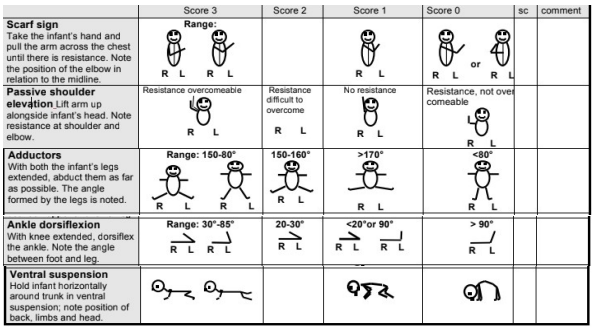
POSTURE

	score 3	score 2	score 1	score 0	sc	Comment / asymmetry
Head in sitting	Straight; in midline		Slightly to side *or* backward *or* forward	Markedly to side *or* backward *or* forward		
Trunk in sitting	Straight		Slightly curved or bent to side	Very rounded rocketing back bent sidewavs		
Hands	Hands open		**Intermittent** adducted thumb *or* fisting	**Persistent** adducted thumb *or* fisting		

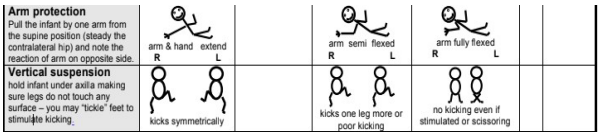
MOVEMENTS

	Score 3	Score 2	Score 1	Score 0	sc	asymmetry
Quantity Watch infant lying in supine	Normal		Excessive or sluggish	Minimal or none		
Quality Observe infant's spontaneous voluntary motor activity during the course of the assessment	Free, alternating, and smooth		Jerky Slight tremor	• Cramped & synchronous • Extensor spasms • Athetoid • Ataxic • Very tremulous • Myoclonic spasm • Dystonic movement		

TONE



REFLEX



APPENDIX C: INFANT AND HOUSEHOLD DEMOGRAPHICS

INFANT DEMOGRAPHICS

	Total N=335	Placebo (0 mg) n=83	1.2 mg n=86	2.4 mg n=81	10 mg n=85
Sex, female	161 (48%)	43 (52%)	43 (50%)	33 (41%)	42 (49%)
Age, years	28.1 (6.2)	28.3 (6.1)	27.9 (6.7)	28.1 (6.1)	28.1 (5.9)
Parity, multiparous	57 (69%)	54 (65%)	54 (63%)	58 (72%)	64 (75%)
Ethnicity, Khmer	335 (100%)	83 (100%)	86 (100%)	81 (100%)	85 (100%)
Marital Status					
Married	330 (98%)	79 (95%)	86 (100%)	81 (100%)	84 (99%)
Divorced/Separated/Widowed	5 (<1%)	4 (5%)	0 (0%)	0 (0%)	1 (1%)
Education					
None	40 (12%)	10 (12%)	8 (9%)	13 (16%)	9 (11%)
Primary (1-6 years)	161 (48%)	43 (52%)	37 (43%)	40 (49%)	41 (48%)
Lower Secondary (7-9 years)	83 (25%)	16 (19%)	29 (34%)	19 (24%)	19 (22%)
Upper Secondary (10-12 years)	43 (13%)	12 (15%)	9 (11%)	8 (10%)	14 (17%)
Higher education	8 (2%)	2 (2%)	3 (3%)	1 (1%)	2 (2%)
Milk total thiamine concentrations (µg/L) at 2 weeks	129.1 (74.4)	135.5 (77.7)	129.3 (71.4)	126.3 (77.3)	125.4 (72.3)

HOUSEHOLD DEMOGRAPHICS

Husband Education					
None	38 (11%)	10 (12%)	9 (10%)	9 (11%)	10 (12%)
Primary (1-6 years)	151 (45%)	42 (51%)	37 (43%)	39 (48%)	33 (39%)
Lower Secondary (7-9 years)	97 (29%)	21 (25%)	24 (28%)	23 (28%)	29 (34%)
Upper Secondary (10-12 years)	34 (10%)	5 (6%)	13 (15%)	8 (10%)	8 (9%)
Household size, *number of people*	3.9 (1.9)	3.7 (1.7)	3.6 (1.8)	4.0 (2.1)	4.1 (2.0)
Median Annual household income, *US$ (IQR)*	1620 (950-3500)	1800 (950-3000)	2050 (963-3500)	1600 (1000-3000)	2000 (1200-3500)
Wealth Index Score					
Poorest	81 (24%)	22 (27%)	12 (15%)	21 (26%)	25 (29%)
Second	69 (21%)	16 (19%)	14 (16%)	20 (25%)	19 (22%)
Middle	108 (32%)	26 (31%)	31 (36%)	24 (30%)	27 (32%)
Fourth	54 (16%)	14 (17%)	20 (23%)	11 (13%)	9 (11%)
Wealthiest	23 (7%)	5 (6%)	8 (10%)	5 (6%)	5 (6%)

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Reopening Wounds: Processing Korean Cultural Trauma in Park Chan-wook's *Oldboy* and *Sympathy for Lady Vengeance*

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ABSTRACT

In 1988, South Korean president Roh Tae-woo implemented democratic reforms in order to host the Olympic Games. These reforms opened the floodgates for Korean New Wave films. The reforms repealed censorship regulations and gave Korean filmmakers the autonomy to actualize their creative visions for the first time since they were colonized by Japan in 1910. The results of this newfound artistic freedom were films that grappled with the trauma of eighty years of colonialism, war, and authoritarian dictatorship through biting political commentary. This study explores Park Chan-wook's representation of 한 (han) Korean cultural trauma in his New Wave films *Oldboy* and *Sympathy for Lady Vengeance*. Using literature on trauma, film, and Korean history combined with original film analysis, this study works to explain the criticisms embedded in Chan-wook's films. The films critique revenge fantasies and both conscious and unconscious ignorance of traumatic events by demonstrating they are ineffective methods of processing한. His films show that the only way to heal 한 is to acknowledge and accept all wrongdoing, even one's own, and mourn the consequences of the atrocities. While 한 is specific to Koreans, cultural trauma is not. The ubiquity of cultural trauma makes the lessons in Chan-wook's works of paramount importance and global relevance. While resolution of trauma is never final, Chan-wook's films serve both as a guideline for and a performance of cultural healing in the face of moral atrocities.

Cultural trauma is as ubiquitous as it is destructive. The trying history of Korea has made cultural trauma so endemic that there is a specific word in the Korean language for the emotion: 한 (han). Park Chan-wook's revenge fantasies 올드보이 (*Oldboy*) and 친절한 금자씨 (*Lady Vengeance*) grapple with the reality of widespread trauma. Chan-wook critiques both Koreans' ignorance and the revenge fantasies catalyzed by their trauma as his characters seek bloody vengeance or bury their pain deep in the subconscious. His films demonstrate both "right" and "wrong" ways of processing pain. They reveal that those who bear trauma cannot give into its vengeful urges, nor can they hide from it. Doing so only perpetuates—rather than heals—emotional pain. Instead, Chan-wook's films demonstrate that to heal from 한, one must mourn all that was lost and then reconstruct an understanding of the self and the world that fits with the events.

To explain this connection between Chan-wook's films and cultural trauma, this study examines first the traumatic history of both Korea and of Park Chan-wook as a filmmaker. Then, it combines in the historical context—with literature

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on trauma and film analysis of *Oldboy* and *Lady Vengeance*—to explain how the films offer all of those who suffer cultural trauma a description of how to process the emotion.

Korea's history is marred by bloody political conflicts and brutal repression. Korean people survived Japanese colonialism (1910-45), only to be torn in half by Western powers (1945) and torn further by the Korean war (1950-53) (Paquet 1). The following decade held no solace—after the Korean War, South Koreans faced yet another trial as they were subject to political oppression during military dictatorship (1961-93) (Paquet 1). For almost the entirety of the 20th century, South Korean citizens were held captive by these political powers outside of their control. Instead, they could only watch current events pass like highlight reels on a television screen. Born in 1963, Park Chan-wook was subject to these repressive realities of authoritarianism throughout his development (Young-jin).

Two years before Park Chan-wook's birth, then—General Park Chung-hee claimed power through the 1961 May 16 Coup (Paquet 6). With his new authority, now—Chairman Park Chung-Hee established the 1962 Motion Picture Law (MPL) which turned the film industry into a heavily regulated "propaganda factory" (Paquet 46, Yecies, Shim 19). It did so by first consolidating the film industry to a more manageable size for the government by outlawing independent films and establishing a licensing system with production standards that were prohibitively stringent for all but a few film production companies (Paquet 46). Second, the MPL enforced harsh censorship by forcing directors to submit their scripts for government edit and approval (Yecies, Shim 21). The end result of the law was that films functioned implicitly and explicitly as propaganda (Yecies, Shim 21). Authoritarianism, while destructive for the film industry, catalyzed Korea's rapid economic development (Yecies, Shim 6). The nation's compressed industrialization exacerbated wealth inequalities. 재벌 (chaebols), Korean business elites, gained outsized profits and influence over the government while the rest of Korea was left trying to scrape by. In 1979, when Park Chan-wook was sixteen, Park Chung-hee was assassinated after a severe economic downturn pushed the Korean people past their breaking point (Yecies, Shim 134). His assassination demonstrated that, though Korea had industrialized, it was still incredibly politically volatile.

A major contributor to South Korea's political volatility was the pro-democratic student activism endemic to Chan-wook's generation. The movements were incredibly important to Korea's gradual democratization but were not without great costs. In 1980, Korean troops opened fire on student protesters, massacring many members of the pro-democratic Gwangju Uprising. Other protests, however, were less lethal and more successful at bringing about small-scale democratic reforms (Yecies, Shim 140, Paquet 41). In 1987, the June Democratic Struggle took place, where nationwide protests broke out in reaction to the indirect presidential election of Roh Tae Woo. In 1988, students and filmmakers protested Hollywood's entrance into the Korean economy, criticizing the devastating effects of Western competition on local filmmakers (Paquet 18, Yecies, Shim 118). The 1980s were also the first decade during which students were allowed to produce their own films, and in 1988 (largely in order to host the Seoul Olympics), President Roh Tae-woo loosened the censorship restrictions of the Motion Picture Law and freed the industry from the government's harsh censorship (Paquet 19).

After the relaxation of censorship regulations in the film industry, filmmakers could finally express a vision that had been repressed for decades, giving rise to a new, highly political era of Korean film: New Wave Cinema (Paquet 21). New Wave films were characterized by biting

social commentary and undercurrents of 한 (Paquet 32). 한 loosely translates to emotional pain or regret that is endured because it is beyond the individual's capacity to process (Hyon-u Lee 124; Paquet 32). Similar to the Indigenous concept of soul wounds or the psychological concept of intergenerational trauma, 한 bends time by constantly driving the pain of the past onto present generations (Jeon 715; 718-719). The emotion 한 is an encapsulation of Korea's trying history and therefore forms a critical part of the Korean identity (Paquet 32). Though of historical origin, 한 is not a stagnant emotion; as the trauma of a nation, it grows with every tragedy. In 1991, Park Chan-wook released his first film. As part of the Korean New Wave film movement, he used his unique filmmaking style to grapple with this emotion.

Park Chan-wook is a household name in both the Korean and international film community because of his unique style of filmmaking. A cinephile since childhood, he graduated with a degree in philosophy from Sogang University and worked as a film critic before he began creating films himself (Young-jin 2). Because of his extensive expertise in film and philosophy, his films play with the distinctive elements of those fields. His works are known to subvert film genres and audience expectations (Layton 2:02, Ciecko and Lee 321). He pushes the boundaries of commercial film by refusing to pander to the audience and often explicitly challenging them (Young-jin 3). His most notable films are collected in the Revenge Trilogy: 복수는 나의 것 (*Sympathy for Mr. Vengeance*) (2002), *Oldboy* (2003), and *Lady Vengeance* (2005) (Young-jin). Originally sold to Western countries as a box set, the postmodern style and dark humor of the trilogy captured the attention of many famous Hollywood directors, and his success at film festivals cemented Chan-wook's place as a giant in the filmmaking community (Ciecko and Lee 324). Despite the famous directors who tried to recruit him, Chan-wook persistently pursued only the projects that he really valued. His success in the international film community allowed him more freedom to do so. His unusually high degree of control over the filmmaking process is evidenced by both his continued subversion of cinematic norms and his repeated use of the same actors across different films (Ciecko and Lee 321). Chan-wook's unilateral focus and unusual degree of control produced films that were overwhelmingly a product of his vision, as exemplified by *Oldboy* and *Lady Vengeance*. This influence was not lightly wielded—Chan-wook used it to engage with Korea's history and create complex, poignant, and political films forged in a distinctive style meant to challenge those who viewed his works.

Chan-wook's *Revenge Trilogy* combined his confrontational style with Korean New Wave norms, exemplified by *Oldboy* as it grapples with the ever-evolving nature of 한. The movie begins with Woojin inexplicably kidnapping Dae-su and holding him captive for fifteen years. When he is released, Dae-su hunts Woojin down, seeking both retribution and the reason for his captivity. He then meets Mi-do, who helps him on his quest for vengeance, and their relationship becomes sexual. Dae-su fails in his revenge, and Woojin then reveals that he was seeking vengeance on behalf of his sister Soo-ah, who died by suicide after Dae-su unwittingly revealed her and Woojin's incestuous relationship to their high school. Woojin also reveals that his revenge was not imprisoning Dae-su for fifteen years, but rather manipulating him into an incestuous relationship with his daughter Mi-do. Woojin then takes his own life. Dae-su is hypnotized again to forget his incestuous actions, and the film ends with him and Mi-do embracing each other in the snow (Chan-wook "Oldboy").

Oldboy reflects 한 through postmodern cinematographic form. Trauma does not adhere to the linear logic of time, and the form of the movie reflects that non-linearity—the boundary between

the past and the present is deliberately blurred. This is best demonstrated by a scene in which Dae-su is depicted chasing down the memory of witnessing Woo-jin's incest (Jeon 727-731; Mi-Ok Kim 257). The school in which this scene takes place is a maze, and at every twist and turn, the characters pulsate from past to present. The disorienting camerawork makes temporal distinctions irrelevant (Chan-wook "Oldboy" 1:20:00-1:20:51). By visually confusing the past moment of the trauma and the present, the film demonstrates how trauma makes the distinction of past and present irrelevant. The camerawork shows how한 incessantly pulls the pain of traumatic events into the present, keeping the wounds raw even if they were inflicted long ago (Herman 37). Through this scene in *Oldboy,* Chan-wook demonstrates that 한 is unaffected by the passage of time and will continue to inflict suffering on the body until it is addressed.

한 is also coarsely exhibited in one of the most uncomfortable scenes in *Oldboy*, a scene in which Woojin uses a gas to sedate Dae-su and Mido after they have sex and then lays with their unconscious bodies in bed (Chan-wook "Oldboy" 1:06:10). Survivors of traumatic events are often compelled to reenact the moment of terror literally or figuratively, which results in a tendency to put oneself in harm's way (Herman 39). These symptoms are clearly exhibited by Woojin. Throughout the film, Woojin repeatedly endangers himself to manipulate Dae-su into reenacting the incestuous relationship he had with his sister. By lying in bed with Dae-su and Mi-do after they have sex for the first time, Woojin is reliving his own initial incestuous acts—the point of no return in his life. He does so by creating a parallel point of no return in Dae-su's life. Through this scene, Chan-wook portrays both how Woojin is influenced by 한and how he perpetuates the emotion by inflicting his trauma onto others.

Lady Vengeance also follows a character suffering from 한. In the film, Geum-ja seeks revenge against Baek, the man who killed her son. Geum-ja is falsely accused of her son's murder and condemned to thirteen years of incarceration. After her release, Geum-ja seeks out her daughter—who was raised in Australia—and returns with her to Korea. She tracks down Baek to enact her violent revenge. However, after realizing he killed four other children, she delays her vengeance to include all the families who were wronged. After torturing and killing Baek, the families eat chocolate cake. Geum-ja walks home in the snow and, in the middle of the street, offers her daughter a white cake. Her daughter offers the cake back to Geum-ja, and the movie ends with Geum-ja crying into the dessert (Chan-wook "Lady Vengeance").

The characters in both *Oldboy* and *Lady Vengeance* not only struggle with 한, they personify it. Geum-ja and Dae-su, like 한, are pulled from the past into the present. Entering modern Korea after more than a decade of isolation, they are literal relics of the past (Choi 173; Jeon 736-737; Kyung Hyun Kim 192). Geum-ja and Dae-su's disconnect from the present can be seen in Dae-su's obnoxious 90's-style sunglasses (Chan-wook "Oldboy" 21:43), Geumja's thirteen-year-old polka-dotted dress (Chan-wook "Lady Vengeance" 7:26), Dae-su's outdated vocabulary (Chan-wook "Oldboy" 23:03), and Geum-ja's equally outdated North Korean weapon (Chan-wook "Lady Vengeance" 19:19). Geum-ja and Dae-su physically embody the unyielding hold of past trauma on an individual—they are stuck in the past and cannot break free.

Geum-ja and Dae-su reflect trauma not only through their appearances but also through their actions. Survivors of trauma are often compelled by the "death drive" (Herman 41): the compulsion towards violent, self-destructive behaviors often culminating in one's own demise. The compulsion of the death drive manifests in both Geum-ja's and Dae-su's extreme and violent paths to revenge and well-exemplified by a standoff between Dae-su

and Woojin halfway through *Oldboy*. Dae-su has a hammer to Woojin's head, ready to enact his revenge, kill Woojin, and move on from the kidnapping towards the rest of his life. But when Woojin threatens to stop his own heart and die, taking with him the reason he kidnapped Dae-su, Dae-su relents (Chan-wook "Oldboy" 0:55:00-0:57:12). Given the choice between "revenge or the truth," Dae-su's desire to know why he was kidnapped is overpowers his sense of self-preservation (Chan-wook "Oldboy" 0:56:06). The compulsion of the death drive is greater than the risk of losing his and Mi-do's life at the vindictive hands of Woojin. By showing how the death drive compels Dae-su to choose truth over vengeance, Park Chan-wook demonstrates that it is not the desire for revenge that truly drives his characters, but rather, unhealed trauma.

Geum-ja and Dae-su are not the only characters who are motivated by the death drive; Woojin, too, exhibits self-destructive tendencies. Unlike the others, though, Woojin is wise to the inefficacy of revenge, stating that "revenge is good for your health, but what happens once you've had your revenge? I bet that hidden pain probably emerges again" (Chan-wook "Oldboy" 0:56:44). Nonetheless, suffering—trapped in his body, absent other alternatives—is expressed through the death drive and compels him to play out his revenge scheme, even though deep down he knows it will not heal his 한. When Woojin dies by suicide at the end of the film, the prophecy of the death drive fulfills, and its inescapability espouses (Chan-wook "Oldboy" 1:51:16). Woojin's suicide again demonstrates that the lack of retribution was not the root of his suffering, but something deeper that revenge could not address.

Just as 한 inflicts suffering on those who experience the emotion, as personifications of the emotion, Geum-ja, Dae-su, and Woojin inflict suffering on those around them and others in society (Eunah Lee). The revenge films contain gruesome acts of violence, like Detective Choi twisting scissors buried in Baek's neck (Chan-wook "Lady Vengeance" 1:35:49) and Dae-su pulling out another man's teeth one-by-one and cutting out his own tongue with scissors (Chan-wook "Oldboy" 41:35; 1:45:47). Woojin even shoots his own right-hand man in the head at point-blank range (Chan-wook "Oldboy " 1:39:33). Furthermore, their quests for retribution result in collateral damage inflicted on innocent characters. For instance, in *Oldboy*, Dae-su aggravates and pummels a group of teenage boys and ties up a dentist for information, Woojin strangles Dae-su's friend with computer wires, and Geum-ja's friend is beaten (Chan-wook "Lady Vengeance" 1:03:46, "Oldboy" 22:30; 1:12:55, 1:10:44). These characters have nothing to do with the traumatic event, but like 한, Geum-ja, Dae-su, and Woojin inflict pain from their past indiscriminately onto others in the present. Herein lies Chan-wook's critique: vengeance does not heal trauma; it only grows the 한 by spreading the pain to others.

The haphazard violence committed by Geum-ja, Dae-su, and Woojin inflicts their trauma onto the next generation. Both Geum-ja and Dae-su's daughters, Jenny and Mi-do, lose their parents as a consequence of traumatic events—Geum-ja's wrongful imprisonment and Dae-su's kidnapping, respectively. Because Jenny and Mi-do are raised in other countries, they are presumably free from the traumas of Korea. However, they are still affected by 한 because, as daughters of both protagonists, they are caught in the crossfire of the older generation's grievances. Mi-do is held captive by a gang and, because of Woojin, is hypnotized into engaging in an incestuous relationship with her father (Chan-wook "Oldboy" 57:30, 1:03:49). Jenny witnesses her mother hold another person hostage at gunpoint (Chan-wook "Lady Vengeance" 1:07:38). In the moments where Jenny and Mi-do are exposed to the horrible acts of vengeance perpetuated by their parents and Woojin, revenge invades the past, present, and future. In the name of vengeance, Dae-su, Geum-

ja, and Woojin drive their unresolved 한 from the past through the present and into the future generation. Chan-wook shows that their misguided attempts to heal the pain ensure their children will carry their trauma as well, proving violence does not resolve 한; it merely creates another source.

Chan-wook accentuates his critique of vengeance by subverting the revenge genre norms to confront the audience with the reality of its violence. In the revenge film genre, the initial act of trauma—the grievance—often happens off-screen and is instead alluded to through synecdoche. The acts of violence are left unseen because the viewer's imagination is always worse than anything the director can show on the screen (Voir, 7:00). Chan-wook applies this technique to the initial grievance in *Lady Vengeance*, displaying four brightly colored keychains instead of the actual children Baek killed (Chan-wook "Lady Vengeance" 1:13:43, Voir 7:43). Chan-wook subverts the genre by also applying this technique when the protagonists enact their revenge on Baek: in lieu of the acts of torture committed by the families, the audience is shown only blood-stained wood and the traumatized faces of those who enacted the violence (Chan-wook "Lady Vengeance" 1:33:34, 1:34:33). This allusion to violence implicates the disturbing impact of revenge without much actual violence. Imagining the horrors of revenge emotionally drains the audience and makes them question why they were rooting for vengeance in the first place (Vior 15:57). Through the emotional toll of this genre's subversion, Chan-wook manipulates the audience into experiencing not only how ineffective revenge is at addressing trauma but how it exacerbates it by creating new suffering.

While the inherently disturbing quality of violence is enough to indict the logic of revenge, Chan-wook adds another unsettling layer to the critique through the calculated and clinical nature of revenge in *Lady Vengeance*. There is a noticeable lack of tension as, one-by-one, the families enact unspeakable violence on Baek: drawing little pieces of paper with scribbled red numbers, waiting side-by-side on a bench in matching clear plastic raincoats, and calmly filling a bucket with the blood of a dead man and folding up the tarp (Chan-wook "Lady Vengeance" 1:29:05; 1:35:08; 1:36:12). It feels wrong. It feels too real and too casual. The acts of violence, especially when conducted in such a calculated and nonchalant manner, blur the line between good and bad, normal and abnormal (Jeong 170). Impactfully, this lack of dramatization allows the audience to project themselves onto the characters (Voir 8:24). In typical revenge films, revenge requires the strength and skill of a superhuman or a specially trained military operative (Voir 10:45). In *Lady Vengeance*, it only requires a human to make the choice to harm another human. It becomes something any person—even members of the audience—could do. Chan-wook's casual portrayal of violence thereby critiques revenge by forcing the audience to identify with characters committing atrocious crimes.

Chan-wook also challenges the logic of revenge through his characters' response to their successful vengeance in another genre subversion. At the end of a revenge story, it is common for the protagonist to die from injuries incurred on their quest for vengeance (Voir 14:17). However, if they die, it is only after they have enacted their vengeance (Voir 14:27). Their death is depicted as peaceful, comforted by the knowledge that justice has been served (Voir 14:27). Woojin's suicide at the end of *Oldboy* flips this trope on its head. While Woojin is unscathed at the end of his revenge plot, he dies by suicide shortly after (Chan-wook "Oldboy" 1:51:16). The viewer expects to see Woojin live on in triumph or at least die content. Instead, Chan-wook portrays the exact opposite: after his revenge, Woojin flashes back to his sister's suicide. His emotional distress is palpable as he watches her fall to her death (Chan-wook "Oldboy" 1:49:44-1:51:15).

Woojin's flashback and suicide show that his trauma persists even after his revenge is successful. In *Lady Vengeance,* the enactment of revenge is equally ineffective at addressing the families' underlying suffering. After torturing Baek, some families stagger out of the room with their faces contorted in pain; others fall through the doorway, traumatized and covered in blood (Chan-wook "Lady Vengeance" 1:34:33). Through depicting the emotional distress experienced by both Woojin and the families after their revenge, Chan-wook shows that retribution does not help characters process their 한; often, it only worsens the pain (Choe 38, Herman 189).

Acting on fantasies of revenge is an ineffective method of processing 한, but ignoring its existence is just as lethal. Chan-wook demonstrates the inefficacy of trying to forget 한 through the parallel suicides of Soo-ah and the man on the roof. At the beginning of *Oldboy,* Dae-su holds onto a suicidal man to prevent him from falling to his death. This moment between the nameless man and Dae-su is later paralleled when Woojin holds Soo-ah to prevent her from falling to her death. The difference in this scene is that Woojin eventually releases Soo-ah (Chan-wook "Oldboy" 1:50:57). However, while Dae-su does talk the man off the ledge, he only does so to get the information he needs to start his revenge plot. When the man attempts to explain why he wants to kill himself, Dae-su walks away, ignoring the root cause of the pain. As he leaves the building, the man crashes into a car below, and Dae-su does not even flinch (Chan-wook "Oldboy" 21:53). The parallel between the suicides of the two characters is emphasized not only through the angle at which they were filmed but also in their fate of oblivion. Dae-su, too caught up in his revenge plot, forgets about Soo-ah, and the viewer, too caught up in the revenge plot, forgets about the nameless man. Through both characters' suicides, Park Chan-wook displays the deadly consequences of failing to address emotional pain.

The ambiguous and unsettling ending of *Oldboy* similarly demonstrates the inefficacy of forgetting as a solution to dealing with cultural trauma. At the end of *Oldboy*, Dae-su asks to be hypnotized to forget his incestuous actions. The hypnotist guides him to split into two different people, the monster who has committed the evils and the rest of himself (Chan-wook "Oldboy" 1:54:03). As he walks away from the monster, he walks away from his hurtful memories. This hypnosis mirrors the post-traumatic amnesia experienced by survivors of trauma. Survivors' memories of the traumatic event are often split off from ordinary awareness (Herman 42). As a result, they live without conscious remembrance of the traumatic event, but the memories and the trauma remain trapped within the body. Dae-su's ambiguous expression at the end of the film, a mixture of pain and joy, portrays this reality: forgetting leaves lingering trauma (Jeon 736). The unresolved memories burden survivors and influence them subconsciously. Chan-wook's depiction of Dae-su's ambiguous expression at the end of the film makes it clear that while Dae-su may not remember the event, he is far from healed.

한 remains trapped within the bodies of not only those who forgot the sources of their trauma but also those who are unwittingly ignorant of them. Mi-do, despite not knowing that Dae-su is her father, is still affected by the incestuous nature of their relationship. The discomfort experienced by the viewer at the ambiguity of whether the incestuous relationship will continue is a testament to the inefficacy of ignorance. Furthermore, in this ignorance, Mi-do cannot remove herself from the relationship and move forward, because she does not know it is a source of trauma. Herein, Chan-wook's critiques connect with theories of trauma recovery: Mi-do's ignorance prevents her from healing because to heal, a survivor must reconstruct the event that is at the root of the trauma (Herman 176).

Addressing the root of the trauma means opening Pandora's box. The characters must let all the evil out, and only then will they have hope (Post-conflict Hauntings Transforming Trauma and Memory, 79). In the instance of *Oldboy*, Chan-wook gives Mi-do a literal Pandora's box: the purple box holding the photo album documenting her and Dae-su's incestuous relationship (1:36:07). Because she never opens the box, she is never given the chance to heal, she is never given hope, and the situation remains a blight on her own and Dae-su's life. Mi-do's unresolved trauma is visually performed when she and Dae-su embrace at the end of the film. Chan-wook uses the camera angle to frame Mi-do's all-red outfit as a stain amongst the white snow (Chan-wook "Oldboy" 1:55:20). The red clashing against the white represents the 한 that forgetting and ignorance could not wipe away.

While the red stain of trauma may never be wiped away, healing does not mean returning to purity—it means learning to live with the stains. While the trauma Geum-ja and Dae-su experienced and the actions they took in response mean they could never return to who they were, they remain redeemable. This phenomenon is played out best in *Lady Vengeanc*e. At the beginning of the film, Geum-ja refuses to eat the tofu and accept the purity it represents (Chan-wook "Lady Vengeance" 7:00-7:05). However, at the end of Lady Vengeance, Geum-ja offers Jenny a white cake she made and implores her to "be white" (Chan-wook "Lady Vengeance" 1:48:26), to not be like her, to be free of sin. In response, her daughter offers the cake back, and Geum-ja accepts it (Chan-wook "Lady Vengeance" 1:49:05). The fact that she accepts the cake rather than the tofu is noteworthy for two reasons. First, accepting cake instead of tofu is a refusal of the notion that someone must be pure or free from sin to move forward in their lives (Choe 42-43). Rather, it argues for a kind of forgiveness that acknowledges the pain of past transgressions moves forward despite it. Second is that Geum-ja accepts not something that is offered to her, but something that she made herself. This is a metaphor for the fact that healing and closure cannot be offered from another—they must come from the self. Because healing requires adapting to the wounds trauma has inflicted on one's own life, it is only through the work one puts into themselves that they can heal.

The next step towards healing that Chan-wook shows is mourning. After Geum-ja accepts the cake, she buries her face in the dessert and cries (Chan-wook "Lady Vengeance" 1:49:05). Geum-ja's tears are important because they represent mourning. To heal from trauma, its roots—the loss—must be addressed, and acknowledging that loss often comes in the form of mourning (Herman 188). Dae-su and Geum-ja lose more than a decade of their lives, they lose their children and families, and most of all, they lose themselves. Caught up in their revenge plots, they turn into the very demons they seek to destroy. By mourning this loss of not only their families but themselves, Geum-ja and Dae-su can begin to reconstruct an understanding of themselves and the world that both fits with past events and permits forgiveness for themselves, like Geum-ja does with the cake. In this way, Chan-wook demonstrates that instead of allowing the wounds of trauma to fester with ignorance or become infected with revenge, those who suffer from 한must allow themselves to feel the full pain of the loss and then mourn. It is by reopening old wounds, experiencing their pain, and then finally healing from within that Chan-wook's characters begin to redress their trauma.

Park Chan-wook's films exemplify the follies of both acting on and ignoring 한. His films demonstrate that the only way to heal 한 is to acknowledge and accept all wrongdoing, even one's own, and mourn the consequences of the atrocities. While 한 is specific to Koreans, cultural trauma is not. It is widespread, as evidenced by the effects of Apartheid in South Africa, the Rwandan Genocide, the legacy of slavery and ongoing atrocities committed against BIPOC Americans.

The ubiquity of cultural trauma makes the lessons in Chan-wook's works resonate with paramount importance and global relevance. While the resolution of trauma is never final, Chan-wook's films set both a guideline for and a performance of cultural healing in the face of moral atrocities.

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Differences in the Morphology and Reproduction of the Ascidian *Boltenia Villosa* Across a Latitudinal Gradient

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ABSTRACT

While the larval and early juvenile stages of the stalked ascidian *Boltenia villosa* are well-documented in the literature, little is known about the range of morphological variation in *B. villosa* adults. Anecdotal evidence suggests that larger individuals with shorter stalks make up the populations found in Washington, while Oregon populations consist of smaller individuals with longer stalks. The present study aimed to develop a qualitative understanding of the morphological and reproductive differences across the latitudinal gradient of *B. villosa*. Morphological differences between populations were studied through a combination of morphometrics and scanning electron microscopy. To compare reproductive outputs, the diameters of oocytes and the gonadosomatic indices of representative individuals were measured. The results suggest significant differences between the two populations in body proportions, spine character, and reproduction despite their genetic similarities. These preliminary results provide the basis for future research into the distribution of *B.villosa* and the possible existence of an undescribed subspecies of *B. villosa*.

1. INTRODUCTION

1.1. IMPORTANCE OF THE CLASS ASCIDIACEA

Despite their unassuming nature, ascidians have proven their usefulness across various fields of medicine. As the closest invertebrate relatives to humans (phylum Chordata, subphylum Tunicata), ascidians, commonly known as sea squirts, have a simplified genome that can be studied to provide insight into the regulatory pathways and functions of more complex vertebrate genomes (Monniot et al. 1991; Corbo et al. 2001). Ascidians are also a source of chemical compounds that are valuable to the pharmaceutical industry (Monniot et al. 1991): these compounds, often produced by an ascidian's symbionts, are being used to develop new antimalarials, antivirals, antibiotics, and cancer treatments (Shenkar and Swalla 2011; Watters 2018).

In the fields of ecology and marine environmental issues, ascidians have been a valuable proxy in the study of food webs and changes to marine ecosystems. As sessile, benthic filter feeders, native ascidians represent a key link in their food webs between the sea floor and open water communities (Monniot et al. 1991; Drgas and Całkiewicz1 2019) and therefore have a powerful impact on local ecology. Meanwhile, non-native and invasive ascidian species greatly influence local communities, as their arrival often threatens the survival of endemic species (Shenkar and Swalla 2011). Yet, invasive ascidians can be beneficial in the biomonitoring of pollution

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and anthropogenetic stressors (Tzafriri-Milo et al. 2019). This is because ascidians retain concentrated levels of toxins that impact overall water quality and have a siphonal sensitivity to mechanical disruptions such as port activities. Researchers have thus developed ways to record stress in ascidians and associate it with the presence of different contaminants and anthropogenetic disturbances (Monniot et al. 1991; Kuplik et al. 2019; Marques et al. 2022).

While other marine organisms may be more well-known or charismatic, there is value in advancing our existing understanding of ascidians. Without an adequate study of an ecosystem's ascidian populations, it is difficult to see the importance of a native ascidian species, the harm of an invasive species, or whether a specific species should be classified as native or non-native. In the fields of evolutionary and pharmaceutical medicine, undiscovered or cryptic ascidian species may remain overlooked and their possible benefits to humanity left untapped. Before additional advancements in medicine and ecology can occur, the first step to understanding more about ascidians is to study their biology—starting with their morphology and reproduction.

1.2. LIFE HISTORY OF *BOLTENIA VILLOSA*

Research centered around *Boltenia villosa*—a solitary ascidian found along the North American west coast, from southern Alaska to southern California—has historically focused on its settlement and metamorphosis. In its larval stage, *B. villosa* takes the shape of a free-swimming tadpole with orange pigmentation in the muscle and mesenchyme cells (Cloney et al. 2002). In this stage, the presence of a tail, notochord, and nerve cord classify ascidians in the phylum *Chordata* (Cloney et al. 2002; Davidson et al. 2003). The larvae use caudal musculature for swimming until an appropriate settlement site is chosen that will promote survivability and growth (Cloney et al. 2002; Roberts et al. 2007). *B. villosa* larvae exhibit a strong preference for settlement on adult conspecifics or potential refuges, such as the ascidians *Pyura haustor* and *Halocynthia igaboia*, over rocky substratum to avoid predation by the Oregon hairy triton (*Fusitrition oregonensis*) (Young 1985; Young 1986; Young 1989). The mechanism for site selection may be a combination of physical cues and chemical cues from bacterial biofilm covering potential substrata, which is likely how *Boltenia* larvae determine to delay settlement when refuge substrata are unavailable (Young 1989; Roberts et al. 2007). After settlement, the larvae undergo metamorphosis into their juvenile forms.

The metamorphosis of *B. villosa*, which follows the typical order of ascidian development, occurs in two stages: a stage of rapid change completed within a few hours of settlement and a stage of sustained change across a 7-day period (Davidson et al. 2003). Minutes after settlement, the papillae used in adhesion retract, the tail is reabsorbed, and the notochord cells flow out of the notochordal sheath (Cloney et al. 2002). At the end of the first stage, the notochord, muscle, and nerve cord cells are consumed by phagocytes and the organism is considered a juvenile (Cloney et al. 2002). In the subsequent 7 days, differentiation of the gut and body wall musculature progress in tandem (Davidson et al. 2003). Once the second stage of metamorphosis is complete, the juvenile of *B. villosa* can begin feeding (Cloney et al. 2002; Davidson et al. 2003).

While the larval and early juvenile stages of *B. villosa* are well-documented in the literature, little is known about the morphological variation in adults. Originally described by William Stimpson in 1864, *B. villosa* is identifiable by the short, fine-tipped spines covering its tunic, the presence of a stalk used for attachment to the substratum, and the transverse stigmata within its branchial sac (Stimpson 1864; Van Name 1945; Berrill 1950). More recent studies have shown that *B. villosa*

reproduces throughout the year (Cloney, 1987; Bingham, 1997), and reproductive timing is not dependent on light cycles (Cloney 1987; Bingham 1997).

1.3. OBSERVED TRENDS IN BIOGEOGRAPHY AND MORPHOLOGY

Outside of the current literature, scientists working in the eastern Pacific have noticed trends in the distribution of *B. villosa*, but these observations remain mostly anecdotal. Equatorial submergence is a phenomenon in which individuals of a species living along a latitudinal gradient are found in deeper waters as they approach the equator, probably to avoid warmer surface sea temperatures while receiving a similar level of illumination from the sun (Ekman 1953; Lüning and Liining 1990), and *B. villosa* is considered a species potentially subject to this phenomenon. In the San Juan Islands of Washington, *B. villosa* is easily found on docks and in shallow waters (Young 1985), but it is incredibly rare on docks in southern Oregon, occurring instead on the continental shelf (Sanchez-Reddick 2021).

Another anecdotal pattern is the variation in body size seen within the species. Early documentation of *B. villosa* describes an inverse relationship between body size and stalk length, as individuals with smaller bodies tend to have longer stalks (up to 3–4 times the length of the body) and individuals with larger bodies tend to possess very short stalks (Van Name 1945). Anecdotal evidence suggests that larger individuals with shorter stalks make up the populations found in Washington, while Oregon populations consist of smaller individuals with longer stalks (C. Young, personal communication). These patterns in *B. villosa*'s distribution and morphology have been observed by researchers, but they have not been formally studied or described in the literature. There remain many unknowns about *B. villosa*, specifically the potential relationship between its size, depth distribution, and latitudinal gradient.

The present study aims to develop a qualitative understanding of how morphology and reproductive output change across the latitudinal gradient of *B. villosa*. In this study, I test the hypothesis that the *B. villosa* population of the Salish Sea in Washington has significant morphological and reproductive differences from the population off the southern coast of Oregon. This novel research also aims to uncover possible cryptic species through molecular analysis.

2. MATERIALS AND METHODS

2.1. SPECIMEN COLLECTION

Boltenia villosa samples were collected from a shallow-water site in the Salish Sea in Washington and a deep-water site off the southern coast of Oregon during the autumn. In Anacortes, Washington, 40 specimens were collected off floating boat docks (48°31.1439N, 122°37.3489W) in September 2021. Off the rocky reef of Cape Arago, Oregon (43°15.3521N–43°16.8762N, 124°26.4627W–124°27.7112W), 172 specimens were collected with a box dredge at depths from 44.19m to 54.86m in November 2021. Special care was taken to remove the ascidians from any hard substrate they were anchored onto to preserve their stalks. All specimens were fixed in 10% formalin for at least 24 hours and transferred into 70% ethanol for long-term preservation and storage at 20°C. Each ascidian was given an ID related to its collection location and date.

2.2. MORPHOLOGY

2.2.1. MORPHOMETRICS

The external anatomy of all 212 *B. villosa* specimens was measured using a Vernier caliper. The stalk of *B. villosa* is identifiable as a protrusion found on the ventral side of a specimen's rounded body (Van Name 1945); as such, the lengths of the

body and stalk were measured separately (Fig.1). The width measurement of the body was collected at the widest point of each specimen, and the stalk width measurement was collected at the base of the body (Fig.1).

2.2.2. SCANNING ELECTRON MICROSCOPY (SEM)

To identify any minute morphological differences between the two populations, five representative specimens from Oregon and three representative specimens from Washington were chosen for SEM analysis of the spines covering their tunics. Six spines were cut at their bases from each individual and mounted onto a specimen stub using forceps and adhesive transfer tabs. Then, the spines were allowed to air-dry to evaporate any excess ethanol from the sample preservation process. The stubs were sputter-coated with gold in a Cressington Sputter Coater 108auto. Photographs of the spines were taken with a Tescan Vega scanning electron microscope at an accelerating voltage of 10.00kV. The photographs were analyzed, and any spiny protrusions with a visible attachment to the main spine were counted.

2.3. REPRODUCTION

2.3.1. GONADOSOMATIC INDICES (GSI)

To compare the reproductive activity of the two populations, gonadosomatic indices were calculated for a random selection of ten Oregonian and ten Washingtonian specimens. The tunics—which act as ascidians' protective outer layers—of many individuals were covered in fouling material and epibionts. The presence of fouling material and epibionts would have impacted the total weight of the specimens, so the tunics were removed and not included in body weight measurements. Each specimen was weighed and dissected for its gonads so that both gonads could also be weighted. The following formula was used to compute each GSI: (gonad weight / total specimen weight) · 100.

2.3.2. OOCYTE DIAMETERS

13 moderate-to-large-sized specimens from Oregon were selected for histology. Both gonads were removed from each ascidian, dehydrated in an ethanol series from 50% to 100% ethanol, cleared with toluene, and submerged and embedded in molten paraffin. Gonads were semi-serially sectioned at a thickness of 7μm with an AO "820" microtome. Slices were stained using hematoxylin, ponceau de xylidine, phosphomolybdic acid, and fast green. Slide covers were adhered with Permount Mounting Medium.

Six specimens collected during the autumns of 1979 and 1980 in Friday Harbor, Washington (48°32.0813N, 123°1.1315W) were used to represent the Washington population. The Washington samples were dehydrated, sliced, and stained by Craig Young with assistance from an undergraduate intern at the time of collection, but the analysis occurred in 2021 and 2022. These specimens were selected for analysis because quality histological slides were readily available, and it is unlikely the reproductive output of the *B. villosa* population of the Salish Sea has changed significantly over the last 40 years (C. Young, personal communication).

The diameter of the first 100 oocytes from each specimen was measured using ImageJ on photographs captured with a ZEISS Axiocam 208 color microscope camera on a ZEISS Stemi508 microscope at a magnification of 5x.

2.4. MOLECULAR ANALYSIS

To identify any phenological differences between populations, the same five representative Oregon specimens used for SEM were selected for molecular analysis and immediately transferred into 95% ethanol at 20°C. Using a DNeasy Blood and Tissue Kit (Qiagen), DNA was extracted from the internal tissues of the specimen. Before adding lysis buffer, the tissues were rinsed with reverse

osmosis water to wash away excess ethanol. For each 2x2x2 mm sample of tissue, tissue lysis was performed with 180 µl ATL butter and 20 µl proteinase K at 56°C for at least 24 hours.

PCR-amplification was done for the cytochrome *c* oxidase subunit 1 DNA barcoding region (658-696 bp, COI). Two primers were used for amplification: universal LCO 1490 [5′ GGTCAACAAATCATAAAGATATTGG 3′] and HCO 2198 [5′ TAAACTTCAGGGTGACCAAAAAATCA 3′] (Folmer et al., 1994) and tunicate-specific ASC_COI_F [5'-TCGACWAATCATAAAGATATTAG 3'] and ASC_COI_R [5' GTAAAATAAGCTCGAGAATC 3']. 1-µl t issue samples were diluted in 9 µl water. 2 µl of diluted solution and 18 µl of master mix (nuclease-free water, 5x buffer, dNTPs, Go Taq, and forward and reverse primers) underwent a PCR cycling with the following framework: 2-minute initial denaturation at 95°C, 35 cycles of 40 seconds at 95°C, 40 seconds at 45°C, 1 minute at 72°C, and a final 2-minute primer extension at 72°C. Gel electrophoresis was used to check the quality of the DNA samples, and the samples amplified with tunicate-specific primers were selected for sequencing. PCR purification was performed with the Promega SV Wizard Gel and PCR Cleanup kit (Promega) before the samples were sequenced (Sequetech Inc, Mountain View, CA) in the forward and reverse directions.

2.5. DATA ANALYSIS

Morphometric data from the two populations were compared with a multidimensional scaling (MDS) plot using untransformed data and a Bray-Curtis similarity test in R version 4.2.0 and RStudio. An analysis of similarities (ANOSIM) statistical test was done to determine the significance of the differences between the two groups. Box and whisker plots were created in Excel to visualize the gonadosomatic index calculations and the oocyte sizes of the Oregon and Washington specimens. Using 2-sample, 2-tailed t-tests, the differences in spine coverage, GSI, and oocyte sizes between populations were tested for significance. Analysis of molecular sequences was performed using Geneious Prime 2022.1.1 and added to GenBank. Sequences from these Oregon specimens were compared to existing sequences in GenBank, including sequences from individuals near San Juan Island, Washington, and British Columbia.

3. RESULTS

3.1. MORPHOLOGY

During specimen collections, a pattern in *Boltenia villosa* from Washington to Oregon emerged that corroborated previous anecdotal observations with larger, shorter-stalked individuals in northern waters and smaller, longer-stalked individuals in southern waters (Fig. 2). This pattern was further supported by morphometric data on quantitative differences in body length and width and stalk length and width. The frequency distribution of each morphometric variable showed that individuals found in Washington tended to have larger bodies in terms of length ($\bar{x}$ = 22.923mm ± 6.003) and width ($\bar{x}$ =17.4mm ± 5.3), with shorter ($\bar{x}$ = 9.038mm ± 4.507), thicker ($\bar{x}$ = 8.132mm ± 2.626) stalks, while the Oregon population consisted of individuals with shorter ($\bar{x}$ =5.9mm ± 2.519), thinner ($\bar{x}$ = 9.1mm ± 3.473) bodies and longer ($\bar{x}$ =13.9mm ± 6.85), thinner ($\bar{x}$ =1.4mm ± 0.439) stalks (Fig. 3). A multidimensional scaling (MDS) plot, which provided a good representation of the data (stress = 0.063), showed a clear separation between the two populations with very little crossover (Fig. 4). An ANOSIM test confirmed that there was a significant difference between the two groups, specifically as compared to the similarities shared by individuals of the same population (R = 0.7343, p = 0.001).

There were also microscopic dissimilarities in the spines covering the tunics of this species.

Scanning electron microscopy revealed the presence of tiny spines protruding from the main spine on all but two of the spines collected from the Washington specimens, averaging 14.421 protrusions per spine (± 12.873) (Fig. 3). However, Oregon specimens tended to have smooth spines (except in the case of one spine), averaging 0.37 protrusions per spine (± 1.925) (Fig. 5). These differences were shown to be statistically significant by way of a 2-sample, 2-tailed t-test (t_{20} = -4.902, p = 8.603 x 10^{-5}).

3.2. REPRODUCTION

A box and whisker plot showed that the gonadosomatic indexes (GSI) of individuals in the two populations had similar means and large ranges of variance, with mean percent proportions of 30.656% (± 7.250) and 35.552% (± 9.439) for Oregon and Washington respectively (Fig. 6). Using a 2-sample, 2-tailed t-test, it was determined that there was no significant difference between populations in the percentage of body weight that can be accounted for by the two gonads of an individual (t_{17} = 1.301, p = 0.211).

Although the GSI values did not differ greatly, the diameters of the first 100 oocytes in individuals from Oregon and Washington did differ. A 2-sample, 2-tailed t-test showed a significant difference between populations in the size of their oocytes during the same season (t_{973} = 9.272, p = 1.151 x 10-19). On average, individuals from Washington had larger oocytes ($\bar{x}$= 0.377µm ± 0.166) than individuals found in Oregon ($\bar{x}$ = 0.305µm ± 0.133) (Fig. 7).

3.3. MOLECULAR ANALYSIS

Four out of the five samples chosen for molecular sequencing were analyzed successfully. The four specimens were found to be the same species, with less than 0.5% of the genetic sequence in their COI barcoding region being different. When compared to *B. villosa* specimens barcoded from Washington and British Columbia, there was over 98% base similarity in genetic sequencing (Fig. 8). This suggests that the populations from Washington and Oregon are of the same species and that their morphological and reproductive differences are habitat-related phenotypic differences, not a result of interspecies differences.

4. DISCUSSION

There are two distinct morphotypes of *Boltenia villosa* with significantly different reproductive outputs reflected by the populations found near Anacortes and Cape Arago. The quantifiable morphological differences between these populations of *B. villosa* are consistent with previous anecdotal observations: individuals found in Anacortes, Washington could be identified by their large bodies and short stalks, while the Cape Arago, Oregon population consisted of individuals with small bodies and long stalks. Interestingly, morphological differences also extended to the spine character of each morphotype, as the Washington individuals had hairy spines and the Oregon population had smooth spines. In terms of reproduction, the Washington population had larger oocytes than the Oregon population, but their gonadosomatic indices were similar. The difference in the proportion of gonad to total body weight was not significant, which may be explained by members of this species maximizing their fitness and reaching a similar GSI proportional limit.

Limitations to sampling efforts are the primary source of ambiguity in the genetic analysis and the definitive outlining of morphotype ranges. Despite their genetic similarities, it is noteworthy that the query coverage of the molecular sequences was only 77%, meaning 25% of the sequences could not be compared to existing GenBank entries. With more sequence entries and increased query coverage, the populations could have registered as having slightly more genetic dissimilarity. While comparing my sequences to

sequences already deposited was a more convenient method of analysis, it would have been preferable to compare my sequences to those of individuals from Washington and British Columbia whose morphology had been quantified similarly to those in the present study. The distance between sampling sites and the lack of collection at varying depths from each site also prevents a more robust comparison of the distribution of *B. villosa* morphotypes. This is especially important as *B. villosa* is assumed to be subject to equatorial submergence, but populations could exist at multiple depths at all latitudes.

5. CONCLUSIONS AND FUTURE DIRECTION

The present study successfully quantified the morphological and reproductive differences between populations of *B. villosa*. These results are supported by the anecdotal evidence that suggested a relationship between *B. villosa*'s distribution and morphology yet had previously been undescribed in the literature. This study is the first to document the differences in spine character and reproductive output between populations of *B.villosa* in the literature. Despite their distinct morphological differences, no cryptic species were uncovered in the molecular analysis; therefore, these populations are not the result of the misidentification of two separate species. As members of the same species, researchers can freely use either or both *B. villosa* morphotypes in studies that may provide additional insights in various fields, including the areas of biomedicine or evolution. These results also create a strong foundation for the continued exploration into these populations of *B. villosa* and possible explanations for their differences. A robust sampling of *B. villosa*'s distribution could provide necessary baselines for the study of dynamic phenomena such as climate change, invasive species introduction, and the role *B. villosa* plays in its native habitats.

It is also possible that the distinction of a new subspecies of *B. villosa* may be appropriate given the clear separation of *B. villosa* morphotypes across its range. However, more sampling would be necessary to determine regions of sympatry in the species' latitudinal and depth ranges and identify any phenotypic variation that may explain the morphological differences. These efforts would add to our understanding of the global biodiversity level and contribute to studies on the potential environmental causes of *B. villosa* morphotypes.

Potential future research may examine the impacts of food availability and water temperature on oocyte diameter or the influence of water movement on a given habitat's morphotype (Koehl 1982; Gosselin et al. 2019). A high priority for future work would be to collect and analyze animals from multiple depths at each of several latitudes to determine if the observed differences are latitudinal or bathymetric and to distinguish any new subspecies.

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I want to thank Caitlin Plowman, Lauren Rice, Christina Ellison, Emma Burke, and Amanda Ludtke for their guidance in the areas of histology, scanning electron microscopy, and molecular analysis, and the entire Young Lab, including Dr. Sinja Rist and Avery Calhoun, for helping me collect specimens off Cape Arago, Oregon. I would like to extend a special thanks to Caitlin Plowman for providing invaluable intellectual and emotional support, even when out at sea on research cruises. I would like to thank the Robert. D. Clark Honors College for funding portions of my research through the Mentored Research Program and I appreciate the CHC for valuing my research. Finally, I want to thank my mother, Kathy Sanchez-Reddick, for always cheering me on, and my father, Bruce Reddick, who, although no longer with us, continues to strengthen and guide me.

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FIGURES

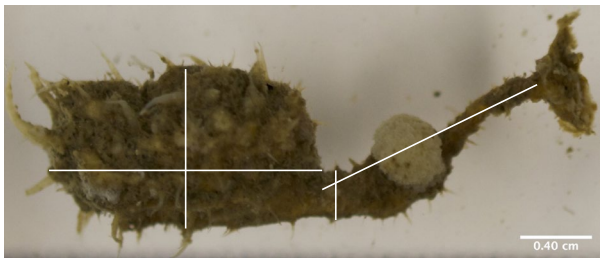

Figure 1: Diagram of morphometric measuring method. Individuals from the Oregon and Washington populations were measured using four morphometric variables: body length and width and stalk length and width. The endpoints for each measurement are outlined in white.

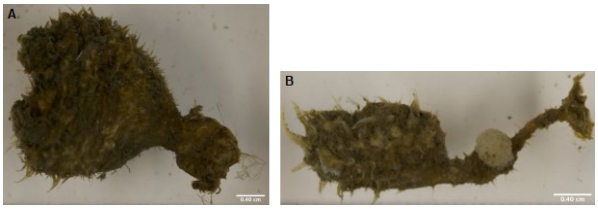

Figure 2: Photographs of representative specimens from Washington (A) and Oregon (B). Individuals collected from Washington were recognizable by their large bodies and shorter stalks, and individuals collected from Oregon had small bodies and longer stalks. The Oregon specimen has an epibiont attached to its stalk, which was common for individuals from that population.

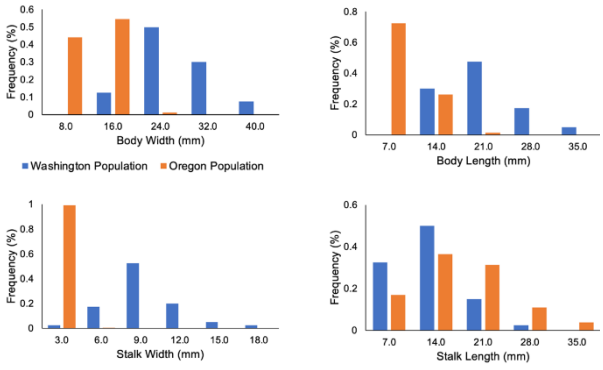

Figure 3: Frequency distribution of each of the four

morphometric variables for the Washington (blue) and Oregon populations (orange). The x-axis houses each variable and the y-axis depicts the frequency of a measurement bin in a population. The Washington population usually had wider, taller bodies and wider, shorter stalks. Individuals in Oregon tended to have thinner, shorter bodies and thinner, longer stalks.

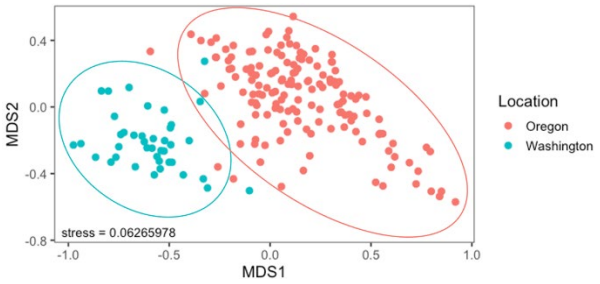

Figure 4: Multidimensional scaling (MDS) plot showing the morphological dissimilarity and similarity of all measured B. villosa specimens. The overall morphological differences due to body length, body width, stalk length, and stalk width between two specimens are visualized by the distances between their points. Individuals collected in Washington (blue) and individuals collected in Oregon (red) were distinguished using color to compare the two populations of B. villosa. The low stress value indicates that the plot is a good representation of the data.

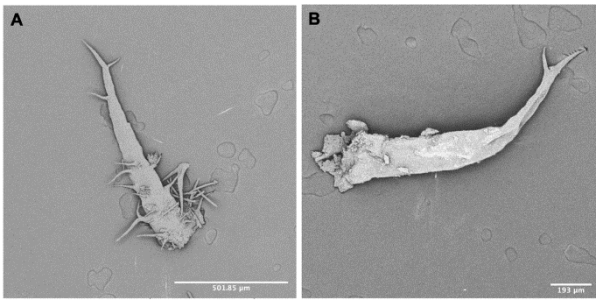

Figure 5: Scanning electron miscopy images of (A) a spine removed from a Washington specimen and (B) a spine removed from an Oregon specimen. There were distinct and significant differences between the spines of the two populations, with the spines from Washington having additional spiny protrusions and the Oregon spines being entirely smooth.

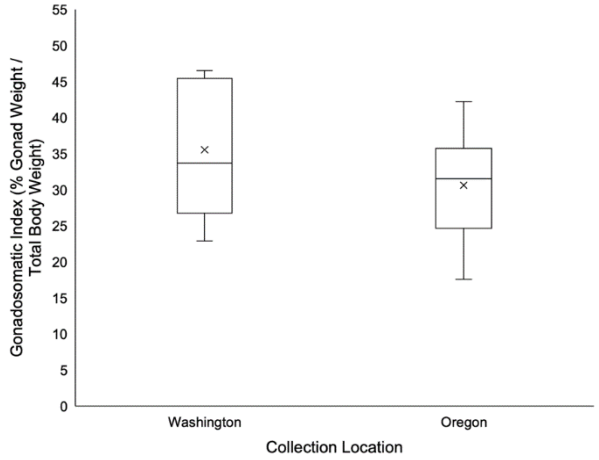

Figure 6: Box and whisker plot of the gonadosomatic indexes (GSI) of individuals collected in Washington and Oregon. The y-axis shows the percentage of gonad weight to total body weight and the x-axis displays the collection site. The whiskers of the plot represent the upper and lower 25% of oocytes, and the central line indicates the median for each population. There was no significant difference in the GSIs between the two populations.

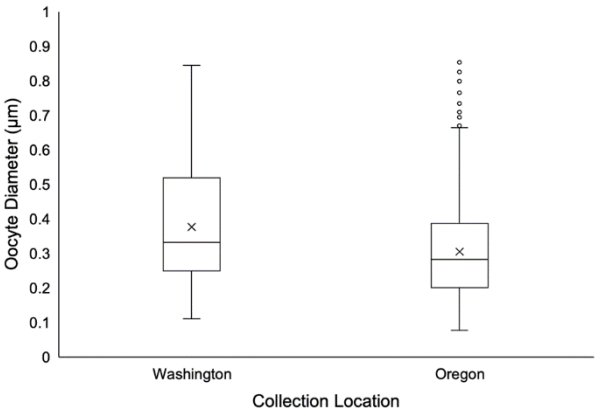

Figure 7: Box and whisker plot of the diameters of the first 100 oocytes from 19 individuals collected in Washington and Oregon. Individuals from Washington tended to have larger oocytes than individuals found in Oregon. A 2-sample, 2-tailed t-test showed there was a significant difference between the two populations in their oocyte diameters.

Figure 8: Barcoding region COI tree for *B. villosa* specimens submitted to GenBank. Specimens from Oregon (red) were sequenced and compared to existing B. villosa entries from Washington and British Columbia (black). B.villosa from Oregon were genetically similar to members of B.villosa found elsewhere within its range. Boltenia ovifera is provided as a reference point and has a 17% similarity to B. villosa.

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Representing Themselves: Contesting Western Representations of Minoritized Communities in the Poetry of Danez Smith, Franny Choi, and Tommy Pico

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ABSTRACT

Over time, dominant world powers like the United States have levied the tool of definition to dehumanize, delegitimatize, and disempower certain peoples. How society defines what is normal vs. abnormal, human vs. inhuman, positive vs. negative, and so on has the potential to privilege certain groups over others who are defined as worse in some way. However, dominant cultures do not hold the power of definition exclusively. In recent years, individuals from minoritized communities have taken to defining their identities independently of their dominant culture's representation of them after fighting for and winning certain rights and liberties that they had previous been denied. In particular, some poets from minoritized communities within the United States have made self-identification central to their works. They do this by examining the ingrained misrepresentation of minoritized communities—located in the numerous forms of American mass media (television, film, literature, news, etc.)—and unmasking the embedded systems of oppression that pervade those misrepresentations. This essay analyzes a collection of poetry from three contemporary poets of minoritized communities within the United States: Danez Smith's *Don't Call Us Dead*, Franny Choi's *Soft Science*, and Tommy Pico's *Nature Poem*. In each of their collections, the poets resist American media's misrepresentations of *their* specific identity by asserting their own experiences and identities as a point of direct contrast. Specifically, Danez Smith resists American media's obsession with the deaths of contemporary Black people by celebrating Black life; Franny Choi addresses American media's dehumanization of Asian-descended peoples by contesting the Asian-robot archetype from American science fiction; and Tommy Pico resists the historical ecological Indian stereotype by reimagining the nature poem. In all three of their collections, the poets take up the powerful weapon of language to both reject the false identities the United States has forced upon them and represent themselves in a way that is unadulterated by American media.

1. INTRODUCTION

American mass media is fraught with ingrained stereotypes that persist into the present day. For the sake of this paper, American mass media refers to the various media technologies that reach a large audience via mass communication within the United States. This includes, but is not limited to, American television, film, radio, music, literature, and news. It is important to note that American mass media has far-reaching, international effects, but this paper is mainly concerned with the consequences of American mass media related to various communities located within the nation.

Before it is possible to illustrate how Smith, Choi, and Pico respond to American mass media's misrepresentations of their communities, it must be understood how intrinsically tied the history of American mass media is to the misrepresentation of American minority communities. In the introduction to

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their book *Racialized Media,* Matthew Hughey and Emma González-Lesser discuss the significant role mass media plays in the present day to shape the world's understanding of life overall. They write, "In the era of industrial capitalism and consumer-driven societies, media is a, if not the, primary vehicle for information, goods, services, and how we understand vital connections between political, economic, cultural, and social life" (p. 3). One area where the media's influence has the potential to be particularly harmful is in what Hughey and Gonzáles-Lesser refer to as "racialized media," which is media that "creates and perpetuates ideas about race" (p. 4). In his book *African Americans and Mass Media,* Richard Craig reports that due to the complicated racial makeup and history of the United States, "Media ownership among minorities and women is terribly low… black Americans own 0.6 percent of television stations in the United States, a far cry from the 13.6 percent of the general population [they make up]" (p. 6). This trend is consistent across all minority communities within the United States. Since the vast majority of media within the United States is held by wealthy White men, Craig argues that American mass media perpetuates a "them v. us" narrative that labels minority groups as problems to be "addressed or dealt with" (p. 7). This reality implicates modern American mass media as racialized media, a fact that historical examples indicate has been the case for many years.

Examples of the racialization of American mass media are not difficult to find. In chapter three of his book *Indians in Unexpected Places,* Philip J. Deloria gives one such example in describing the massive popularity of falsely labeled "historical" Westerns in the United States during the 19th and 20th centuries. These Westerns—which took the form of live performances, radio dramas, television shows, and films—heavily romanticized the genocide of Native American peoples by creating and perpetuating stereotypes of Native Americans as uncivilized savages whose deaths were both necessary and inevitable (p. 60). Many of these stereotypes carry on into people's present-day beliefs and understanding. In another example, in the ninth chapter of their book *Discourses of Domination,* Frances Henry and Carol Tator discuss the racialization of American news media through the racialized language of both print and televised news relating to the topic of crime in the United States. In their chapter, they illustrate the "considerable evidence that the media [in the United States] constructs Blacks as criminally disposed" through the media's use of racially coded language and its preference to report on more "newsworthy" crimes that trend toward Black violence against White victims (p. 165). These are just two examples of American mass media's creation and perpetuation of certain stereotypes and misrepresentations of minority communities within the nation. There are many more examples of this trend—some of which will be discussed in detail later in this essay—but one thing is necessary to understand for the sake of this paper: minority communities in the United States are faced with deeply ingrained definitions and representations of their own communities that are often false. This is the same context that Danez Smith, Franny Choi, and Tommy Pico are each responding to in their collections of poetry. By focusing heavily on self-representation in their collections, the three poets simultaneously reject the false and stereotypical representations of their communities formed by American mass media and present alternative representations that they themselves control.

2. DANEZ SMITH'S REJECTION OF BLACK DEATH

American mass media's representation of Black people in the United States has a long history of purporting stereotypes and harmful misrepresentations. One of the earliest American films, *Birth of a Nation,* depicts the Ku Klux Klan as a heroic force that protects White Americans from violent, unintelligent, and sexually aggressive Black men (most of whom are played by White actors in blackface). Both during and after the Jim Crow era, filmmakers,

advertisers, and others have used various caricatures of Black people—such as the "mammy archetype"—to advertise and sell their goods and services. And more recently, in film and television, White-dominated Hollywood executives have gone on to portray Black people as criminals, thugs, and drug dealers at a significantly disproportionate rate to people of other races. (Crockett). While all American mass media's problematic representations of Black people are important to address, one is particularly relevant for Danez Smith's collection of poetry *Don't Call Us Dead*: American mass media's sensationalizing of Black death.

Looking at American history, the United States has sanctioned, enabled, and/or failed to prevent the deaths of Black people throughout the nation's history. Whether it be White communities and individuals lynching Black people throughout the 19th and 20th centuries (NAACP), the failure of the U.S. government to address the A.I.D.S. epidemic which has disproportionally harmed queer Black men (C.D.C.), or the disproportionate violence American law enforcement inflicts upon Black people as compared to other races, Black death and suffering is a very real and prevalent phenomenon in the United States (*Washington Post*). In his collection *Don't Call Us Dead,* Danez Smith does not refute these facts, as a matter of fact, he alludes to them throughout his collection. However, what Smith objects to through his poetry are the ways in which American mass media frames and portrays Black death and suffering. In his article "Black Lives As Snuff", Rasul Mowatt discusses American media's constant depiction of Black death as a phenomenon that seeks to sensationalize the topic, rather than seek actual solutions to it. When discussing how pervasive images of Black death and suffering are in the modern media-centered landscape, Mowatt says that these pictures do not tell a thousand words—nor ten words; Instead, when a picture captures the death of a Black person, "It can show one thing. It tells one story. It tells one word. Death" (p. 2). Mowatt and others writing on this topic suggest that American mass media's constant display of Black death leaves no room for mourning or for a presentation of Black life. In her article "Close-Up: #BlackLivesMatter and Media", Michele Beverly echoes Mowatt's points on the importance of media not focusing solely on the deaths of Black people. She writes that the endless display of images of Black death by American mass media has "Persistently devalued black lives and black deaths" (p. 82). She then goes on to indicate the importance of media—in her case, film—to allow room for mourning and celebration. Creating room for mourning and celebrating Black lives is one of Danez Smith's main focuses in *Don't Call Us Dead*.

From the title of his collection all the way to the back cover, Danez Smith focuses on representing Black people as vibrant, beautiful, and alive. In his opening poem "Summer, Somewhere"[48], Smith immediately creates a contrast between how American mass media depicts his community and how he depicts his community as someone living in it. He does this by creating an alternative world, known as "somewhere", that is identified as, "Not earth / not heaven" (Smith p. 3, lines 9-10). What makes this "somewhere" a place where Black people live joyously is that it is not plagued by the ever-present threat and memory of Black death. The narrator attributes the prosperity of this place to the fact that "Here, there's no language / for *officer* or *law,* no color to call *white*" (lines 11-12). The memory and images of Black death—here in the form of police violence—are not something Black people need to constantly see; they are harmful to them as "we can't recall our white shirts / turned ruby gowns" (lines 10-11). Those living in this different place are happy when they do not recall such images of violence. Additionally, in the poem, it does no good for the American public to see these images either because "history is what it is. it knows what it did" (line 7). If America, here identified as history, knows what atrocities its government

[48] "Summer, Somewhere" is located in the Appendix #1

and its people have committed against Black people, then there is no need for its media to propagate images of Black death in the name of creating change; it already knows what it has done, the images are not necessary. Portraying these Black people as dead, or dying, does not help them. Portraying them as living does. The narrator explicitly says this when he states, "Don't call / us dead, call us living someplace better" (lines 13-14). This direct appeal acts to unveil American mass media's false claims that it seeks social change. The images American mass media displays are not ones that the narrator wants to see. In this opening poem, Smith's narrator suggests that calling Black people dead does not create change but imagining them alive in better circumstances just might.

Later in the collection, Smith's poem "Dinosaurs in the Hood"[49] grapples directly with American mass media's obsession with Black death—particularly in American film—by envisioning the narrator's ideal movie about the joy of Black communities truly taking place. In this poem, the narrator crafts an over-the-top, raucous, and fun movie about Black people protecting their neighborhood from a dinosaur attack. At every turn, the narrator wants to show the personality and vibrancy of Black communities by having a scene with "grandmas on the front porch taking out raptors / with guns they hid in the walls & under mattresses" and another where "Viola Davis [saves] the city in the last scene with a black fist afro pick / through the last dinosaur's long, cold-blooded neck" (Smith p. 26, lines 20-21, 23-24). The moments of this imagined film are ridiculous and funny, and that is the point. Images of humor and joy are the ones that the narrator desires above all others. In the final lines of the poem, the narrator cements this idea by saying that the only reason he wants to make this film is to have one scene where a young black boy, holding a toy dinosaur, has "his eyes wide & endless / his dreams possible, pulsing, & right there" (lines 35-36). With these closing words, the narrator creates a beautiful image of Black joy that is more important to him than anything else in this film. A film about the joy of Black communities is more important than a film that acts as a metaphor, or a political statement.

In creating a film about Black joy, the narrator also criticizes American mass media's insistence on making films about Black suffering. This is shown when the narrator rejects the idea of having a director like Quentin Tarantino for the movie because he believes that Tarantino would make it into a metaphor for Black suffering (lines 6-8). When faced with films that center on Black suffering like Tarantino's *Django Unchained* and Destin Cretton's *Just Mercy,* the narrator wants an alternative. The narrator states emphatically, "No bullet holes in the heroes. & no one kills the black boy. & no one kills / the black boy. & no one kills the black boy" (lines 32-33). This repeated plea is one that makes sense when faced with the reality that so many American films with Black people serving as the main cast end with the death of one of the main characters. This insistence that the film feature Black life over Black death emphasizes the narrator's goal of giving respite to Black communities who cannot escape images of violence and pain targeted at them. American mass media, symbolized by Tarantino—one of its most successful directors—cannot capture what the narrator believes Black communities need to see in the media they consume. Nowhere is this clearer than when the narrator states that this film "can't be about black pain or cause black pain" (line 28). In this poem, the narrator insists that a film about the joy, wonder, and dreams of Black people, is endlessly more important than a film about the suffering, fear, and death of Black people which American mass media produces regularly.

Toward the end of the collection, Smith makes a final request that American mass media cease its constant barrage of images of Black death in the seven short lines that make up his

[49] "Dinosaurs in the Hood" is located in the Appendix #2

poem "Little Prayer."[50] The poem takes form as the narrator making a request to some unspecified actor to allow images of violence to fade into memories rather than to remain as ever-present and persistent reminders of that violence. The narrator begins by stating, "Let ruin end here" which is particularly poignant due to the word choice of "ruin." Simultaneously, ruin can be understood both as a verb (meaning to destroy or reduce) and as a noun—the remains of something that has been destroyed in the past. In this line, ruin takes the form of significant violence that has left reminders behind, alluding to the long history of violence against Black people within the United States. Importantly, the narrator requests that this violence "end here" at this moment, rather than persist. The narrator asks those in control of the remains of the violence—in this situation, those are understood as American mass media's control over images of Black death—to let them go and cease causing more pain by using them. Instead of forcing more Black people to see these images of violence—referred to in the poem as "a slaughter," and the insides of "a lion's cage" (Smith p. 81, lines 3-4)—the narrator asks to "let him find honey" and "a field of lilacs" instead (lines 2,5). While images of dead bodies that line the lion's cage of history are visceral, the narrator does not want those images to be what people see in the present. Violence has occurred, but beauty, sweetness, and life exist in the here and now that must be celebrated and cherished. However, the narrator acknowledges that focusing on Black life and beauty over Black death and violence is a choice to be made by American mass media. At its core, this poem acts as a request, whether it be of God, the American public, or the American media to "let this be the healing" that Black communities need (line 6). By allowing the images of Black suffering to fade further into history, the narrator believes that American mass media can create space for Black joy and life.

Throughout Danez Smith's collection *Don't Call Us Dead*, he centers his poetry on portraying Black communities as vibrant, joyous, and living. This is not how American mass media portrays Black communities which is why it is so important that Smith's works be recognized. With American mass media problematically portraying Black communities as exclusively dead, dying, and suffering, Smith rejects this narrative and chooses to celebrate the community he loves and calls home.

3. FRANNY CHOI'S RESISTANCE TO THE ASIAN ROBOT ARCHETYPE

As has already been discussed, American mass media has a long history of stereotyping, dehumanizing, and misrepresenting minority communities. This remains the fact when it comes to American mass media's portrayal of Asian-descended peoples. While there are numerous ways American mass media has exploited and stereotyped this population, the way in which it depicts Asian-descended women in relation to science fiction films and television is particularly relevant to Franny Choi's collection of poetry *Soft Science*.

Since science fiction films first entered the mainstream in the mid-20th century, Asian-descended peoples have been closely connected to the genre. In the introduction to their book *Techno-Orientalism: Imagining Asia in Speculative Fiction, History, and Media*, David Roh, Betsy Huang, and Greta Niu trace the long history of Asian representation in science fiction stories. Specifically, they focus on the ways American science fiction depicts Asian-descended peoples and Asian foreign powers as dangerous, subhuman, and exotic, whether that be directly or through use of analogy. In science fiction media, filmmakers often portray Asian nations—like China and Japan––as soon-to-be threats to American freedom and economic superiority (4), Asian cultures as strange and exotic markers of an unsettling futuristic setting (2), and Asian-descended peoples as purely logical and emotionless beings that live for nothing but the

[50] "Little Prayer" is located in the Appendix #3

service of others (7). The various ways science fiction has misrepresented and harmfully stereotyped Asian-descended peoples are referred to by the authors as "techno-Orientalism"—the dehumanization and roboticization of Asian-descended peoples. For Franny Choi's collection, one aspect of techno-Orientalism is particularly relevant. In her article "Asian Female Robots on Screen: Subservience and Eroticization," Anna Trowby discusses American science fiction's history of eroticizing and dehumanizing Asian-descended women. Specifically, she focuses on American science fiction's portrayal of them as robots and cyborgs whose purposes are to be submissive and sexually provocative servants to White American men. She suggests that constant images of Asian robots acting as subhuman servants has negative effects on the perceived agency, humanity, and consciousness of real Asian-descended women. This representation of Asian-descended women as inhuman, robotic, and subservient beings is precisely the representation Franny Choi seeks to resist in her collection of poems *Soft Science.*

Throughout Choi's collection, six poems—all titled "Turing Test"—act as markers for each section of the book. In each of these poems, there is a questioner (identified by italics) who asks questions to a respondent (identified by the non-italicized sections). The intent behind this interrogation is supposedly to "*determine if you* [the respondent] *have consciousness*" [51] (Choi p. 1, line 2). These poems each directly allude to Alan Turing—the father of modern computing—and a hypothetical test he proposed, known as the Imitation Game, to determine if a computer could successfully imitate human thinking. Franny Choi herself discusses the significance of the Turing Test as a symbol in an essay she wrote, aptly titled "Imitation Games." Specifically, in the essay, Choi discusses how she as a Korean American woman often feels as if she is constantly forced to play the Imitation Game to prove that she is human to the Americans she sees in her everyday life. However, just as a computer can only ever imitate humanity, Choi writes that her "version of the imitation game is a losing one." Just like the machines in the Turing Test, she can only ever come close to humanity in the eyes of those who perceive her as inhuman from the get-go. Because Choi directly references the Turing Test in every section of her collection—and given the fact that she wrote an extensive article on the topic—it must be understood that the idea of Asian-descended women never being seen as fully human is a central theme in her collection.

Analyzing the six "Turing Test" poems makes it immediately apparent that the questioner's inquiries are not purely motivated to determine if the respondent is a human or a computer: rather, the questioner is interested in determining if the respondent is a certain kind of human, namely a White American. Throughout the poems, the questioner repeatedly asks about the nationality of the respondent asking, "Where did you come from" (Choi p. 2, line 10), "If you don't like it here… why don't you go somewhere else" (p. 53, line 1,3), and, "What is… your country of origin" (p. 83, line 1,12). The information the questioner seeks directly reflects the kinds of questions people of color in the United States face when White Americans seek to portray them as foreign, out of place, and inferior in forms of media (which subsequently seep into reality). This creates a direct link between the experience of the respondent and the experiences of minority communities thus making the respondent act as a proxy for those populations. However, where an Asian robot from American science fiction would act submissive and answer the questions dutifully and without complaint, the respondent does not do this. Rather, the respondent—acting as a reflection of *real* Asian-descended peoples and not the American stereotype—resists the questioner and asserts its agency despite the questioner placing them in a position of vulnerability.

[51] "Turing Test" can be located in the Appendix #4

In resisting the questioner's authority to define their humanity, the respondent acts as a resistant force to the ingrained stereotypes of their identity in American media. Instances in which the respondent refuses to fall into the stereotype of being a submissive and subservient robot are numerous throughout the "Turing Test" poems. Never, in any of the six poems, does the respondent provide a straightforward answer to the questioner's interrogation. Even when faced with seemingly innocuous questions, the respondent meets them with full paragraphs that do not provide a clear answer. For example, in "Turing Test_Boundaries,"[52] in response to being asked to state their name, the respondent replies with "bone-wife / spit-dribbler… fine-toothed cunt … alien turned 104 wpm" and more (Choi p. 37, line 5-6, 8). Obviously, the respondent has refused to act in the way the questioner expects and wants them to. Additionally, the respondent also does not completely disregard the questions. Instead, the respondent comments on what they know the questioner really seeks. In the example just provided, each of the answers the respondent gives alludes back to what American mass media depicts Asian-descended women as: "bone-wife" evokes the images of a stereotyped Asian robot serving as a housewife, the sexually explicit terms "spit-dribbler" and "fine-toothed cunt" bring about the eroticization of the Asian robot archetype, and "alien turned 104 wpm" (wpm stands for words per minutes in relation to typing on a keyboard) brings to mind the utility aspects of the Asian robot archetype. This subtle action undermines the questioner by unmasking the real intent behind the questions they ask. In doing so, the respondent simultaneously rejects the assumption that they will fall into line as expected and asserts their own agency as a human being.

The reclamation of agency as an Asian-descended woman carries over to another poem in the collection titled "Kyoko's Language Files Are Recovered Following Extensive Damage to her CPU."[53] This poem alludes to the 2014 film *Ex Machina*, which features a character named Kyoko who embodies the Asian robot archetype. In the film, Kyoko is an artificial intelligence played by a Japanese-British actress that acts as a domestic and sexual servant to her creator, Nathan. Additionally, Nathan explicitly states that she is not as intelligent or sentient as his newest creation—another artificial intelligence named Ava, who is played by a White actress—and that her appearance and personality were based on his search history on pornography websites. By the end of the film, Kyoko has been manipulated and destroyed by Ava who strips her for parts after she helps Ava escape Nathan's prison. Kyoko acts as a recent example of the sexual, subservient, and disposable Asian robot archetype. This makes it particularly noteworthy that Choi not only has a poem about Kyoko but also ends her collection with it.

The poem consists of five short sections that contain only singular words and brief phrases that are hard to make complete sense of. However, upon close inspection, the words recovered from Kyoko's CPU reflect the Asian robot archetype that she once fulfilled. The numerous references to animals suggest the dehumanization of Asian-descended peoples, words like "obedient," and "algorithm" reinforce the stereotyped programmed subservience of Asian-descended women, and words––like "clit," "fuck," "doll," and "mouth"––that all can be read as sexually evocative images alluding to the eroticization of Asian-descended women. In the poem, Kyoko is trapped by the expectation her creator, a White American man, drilled into her based on his own pornographic expectations of Asian women. However, within the poem, language—the ability to speak and express one's thoughts—acts as a knife that allows Kyoko to reclaim the agency that her creator deprived her of. After the only complete sentence in the poem which discusses the power language holds to form history, art, and more, Kyoko thinks, "You have such strong hands / (o knife o knife)" (Choi

[52] "Turing Test_Boundaries" is located in the Appendix #5

[53] "Kyoko's Language Files Are Recovered Following Extensive Damage to her CPU." Can be located in the Appendix #6

p. 86, lines 34-35). The poem then concludes with more things Kyoko thinks to say, animals, emotions, and finally, once more, "*knife o knife o knife*" (line 47). This poem acts to illustrate the power Asian-descended women possess to reclaim their identities through language. By using language, Kyoko––the quintessential example of American science fiction's Asian robot archetype––gains a weapon that she uses to carve out space for herself as she is and not as her White creator demands she be. To her, language is a weapon in strong hands that she can use to gain her freedom from the programming placed upon her.

From the numerous "Turing Test" poems to the final poem about Kyoko's reclamation of language, Choi reclaims what it means to be an Asian-descended woman in the United States. For decades, American mass media has crafted an image of Asian women as subservient, sexual, and inhuman. By directly addressing these stereotypes in her work, Choi dismantles them and carves space for Asian-descended women to define themselves as they are.

4. TOMMY PICO'S REJECTION OF THE ECOLOGICAL INDIAN

When it comes to the misrepresentation of Native Americans in the United States, one that has persisted for centuries is referred to as the "ecological Indian" stereotype. The ecological Indian refers to the expectation that Native Americans are inherently environmentalists whose culture ties them to the land differently and more profoundly than non-Native people. While this might not immediately appear to be a harmful representation of Native peoples, as Dina Gilo-Whitaker discusses in her article "The Problem With the Ecological Indian Stereotype", the issue is far more complex. She states that the ecological Indian stereotype "creates an impossibly high standard to live up to" which results in non-Native communities blaming Native communities for failing to prevent the continued destruction of the environment. Additionally, by representing Native Americans as abnormally concerned about the environment, American mass media can ignore the actual disproportionate harm environmental destruction has on Native communities by saying they are "overly sensitive" to environmental issues. In her book *The Ecological Other*, Sarah Jaquette Ray says that making Native Americans synonymous with environmentalism places them "in an impossible position—to support modern environmentalist agendas or be seen as not authentically Native American" (p. 85-86). Just as in any other community of people, individual Native Americans might agree or disagree with various policies, including environmental ones. However, by perpetuating the ecological Indian stereotype in films, television, and literature, American mass media forces Native Americans to perform environmental activism to be seen as authentic Native Americans. This struggle to appear authentic through environmentalism is a central focus of Tommy Pico's *Nature Poem*. In his collection, Pico rejects American mass media's demand that he fill the ecological Indian role and asserts his identity as a Native American who is not defined by his connection to the environment.

Throughout Pico's collection of unnamed poems, a tension arises centered around Pico's narrator's relationship with nature as a Kumeyaay man. On one hand, the narrator rejects the societal demand that he writes about nature due to the history of the ecological Indian stereotype being used as a weapon against Native peoples. On the other hand, the narrator struggles because he truly does appreciate the natural world. This conflict to appreciate nature but not be defined by that appreciation is captured in the opening lines of two of Pico's poems. Early in the text, the narrator states, "I can't write a nature poem / bc its fodder for the noble savage / narrative. I wd slap a tree across the face" (Pico p. 2, lines 1-3). Later on, he writes, "I don't like thinking abt nature bc nature makes me suspect there is a god" (Pico p. 23, line 1). On one hand, the narrator knows that if he, as a Native man, writes about nature, the American

media will reduce him to nothing more than another ecological Indian. However, as a poet, the narrator also desires to write about a topic that is so profoundly powerful to him, that it makes him believe in a higher power. This is what it means to be a Native American surrounded by media that perpetuates the ecological Indian stereotype. Profoundly frustrated by the position he has been forced into, the narrator expresses his anger when he imagines a conversation between himself and a White man who asks if he feels more connected to nature because he is Native American. After expressing anger Pico writes:

> He says *I can't win with you*
> because he already did
> because he always will
> because he could write a nature
> poem, or anything he wants, he doesn't understand
> why I can't write a fucking nature
> poem
> (Pico 15, lines 12-18)[54]

This poem captures the impossible position the ecological Indian stereotype has placed Native Americans in, including the narrator himself. A White man can write a nature poem or whatever else he wants because he is not constrained by the ecological Indian stereotype or any stereotype for that matter. But the narrator faces the stereotype every time he writes another poem or meets another White man in a bar. However, despite the frustration he feels, Pico does not succumb to the stereotype American mass media has placed upon him.

One way Pico asserts his identity as a Native man who loves writing about nature but is not defined by writing about nature is through his redefinition of the topic throughout his collection. If the ecological Indian stereotype is to be believed, Native Americans write about nature in long-winded descriptions of serene, untouched, natural environments. Pico understands this expectation and flips it to focus on another kind of nature: human nature. In the second poem of his collection, the narrator describes a hypothetical situation of meeting a man in a pizza parlor who propositions the narrator for sex. To conclude the poem, Pico writes, "Let's say I literally hate all men bc literally men are animals / This is a kind of nature I would write a poem about" (Pico p. 2, lines 21-22). Later in the collection, Pico subverts the expectations of the ecological Indian stereotype again when he concludes another poem by writing, "Knowing the moon is inescapable tonight / and the tufts of yr chest against my shoulder blades / This is the kind of nature I would write a poem about" (Pico p. 27, 5-7). In both poems, the poet finds a way to circumvent the Ecological Indian stereotype while still writing about the nature he considers worthy of his attention. Notably, Pico even goes as far as to directly attack the expectations of the ecological Indian stereotype by writing:

> it seems foolish to discuss nature w/o talking about endemic poverty
> which seems foolish to discuss w/o talking about corporations given
> human agency which seems foolish to discuss w/o talking about
> colonialism which seems foolish to discuss w/o talking about misogyny
>
> (Pico 12, lines 10-13)[55]

In this moment, Pico criticizes the expectations of the ecological Indian stereotype by suggesting that it is ridiculous and insulting to think that Native Americans who face significant dangers and injustice would only be concerned about the natural environment. To the narrator, writing about human nature and the unnatural harm colonizing powers have inflicted upon Native peoples is far more important than painting a picture of natural beauty. In his collection, Pico indeed writes poems about nature, but by focusing on a subversive kind of nature rather than the natural world, Pico rejects the

[54] This poem can be found in the Appendix #7

[55] This poem can be found in the Appendix #8

ecological Indian stereotype instead of supporting it.

After spending much of his collection fighting against the expectations of the ecological Indian stereotype, the narrator accepts that the stereotype will exist no matter what he or anyone else does in the final pages; however, it is important to note that the narrator also accepts himself as a Native man who is not defined by the ecological Indian stereotype. Throughout the poem, the narrator has felt the need to reject nature so that he is not seen as the ecological Indian by his audience. On the poem on page 67 for example, the narrator loudly proclaims to an audience that he hates nature's guts, but then, "There's something smaller I say to myself / *I don't hate nature at all*" (lines 4-5). As was discussed previously, the narrator feels trapped by the ecological Indian stereotype in that he cannot express his true feelings in public. This internalized fear pervades the collection, but in the final moments of the text, the narrator comes to terms with his love for nature and refuses to live fearfully any longer. In the final poems of his collection, Pico praises the stars (p. 71), imagines himself apologizing to the moss he sits on by a creek (p. 72), and laments the slow destruction of the Earth while watching a sunset (p. 74). In these celebrations of nature, he is still aware that American mass media will depict him as another ecological Indian for doing so when he says, "Admit it. This is the poem you wanted all along" (p. 73, line 1), but he doesn't care. He writes a nature poem not because he is an ecological Indian, not because it is what American media expects him to do, but because he is a man who wants to write a poem about nature. In this moment, Pico triumphs over the ecological Indian stereotype in a reclamation of the truth that he can accept himself and decide to write whatever he wants to.

Tommy Pico's collection *Nature Poem* is as much about his own nature as it is about anything else. In the collection, Pico takes a journey in which he criticizes, rejects, and triumphs over the expectations of the ecological Indian stereotype. In doing so, Pico represents himself and his community in a way that does not bow to the substantial power of American mass media and the misrepresentations it perpetuates.

5. CONCLUSION

Taken individually, the collections of Danez Smith, Franny Choi, and Tommy Pico act as individual reclamations of identity in the face of American mass media's harmful misrepresentations. Taken together, the three poets demonstrate how this can be overcome by the very people that are being affected. In each of their collections, the poets identify a way in which their community is being harmfully misrepresented and combats it by showing its flaws, interrogating its claims, and revealing its lies. Because they are so longstanding, these misrepresentations seem indomitable, but since they are built on weak foundations and supported by paper-thin evidence, they fall apart in the face of resistance. Smith, Choi, Pico, and others like them are that resistance.

As was stated at the outset of this paper, definition and language are tools. Just as American mass media has wielded these tools to harm and disempower minority communities for centuries, these communities—more than any time in the past—can also utilize these tools to heal and reclaim power and identity. Poetry is only one area in which American mass media influences the American public. Film, television, music, news, art, performance, and more are other areas where minority communities can reclaim their identities––and they are. In their poetry, Danez Smith, Franny Choi, and Tommy Pico have demonstrated that the false representations American mass media has perpetuated can be overcome by those willing to use the tools of media to fight for it.

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APPENDIX: POEMS REFERENCED IN FULL

1. "SUMMER SOMEWHERE" BY DANEZ SMITH

somewhere, a sun. below, boys brown
as rye play the dozens & ball, jump

in the air & stay there. boys become new
moons, gum-dark on all sides, beg bruise

-blue water to fly, at least tide, at least
spit back a father or two. i won't get started.

history is what it is. it knows what it did.
bad dog. bad blood. bad day to be a boy

color of a July well spent. but here, not earth
not heaven, we can't recall our white shirts

turned ruby gown. here, there's no language
for *officer* or *law,* no color to call *white*.

if snow fell, it'd fall black. please, don't call
us dead, call us alive someplace better.

we say our own names when we pray.
we go out for sweets and come back.

2."DINOSAURS IN THE HOOD" BY DANEZ SMITH

let's make a movie called *Dinosaurs in the Hood*.
Jurassic Park meets *Friday* meets *The Pursuit of Happyness.*
there should be a scene where a little black boy is playing
with a toy dinosaur pm the bus, then looks out the window
& sees the *T. rex,* because there has to be a *T. rex.*

don't let Tarantion direct this. in his version, the boy plays
with a gun, the metaphor: black boys toy with their own lives
the foreshadow to his end, the spitting image of his father.
nah, the kid has a plastic brontosaurus or triceratops
& this is his proof of magic or God or Santa. i want a scene

where a cop car gets pooped on by a pterodactyl, a scene
where the corner store turns into a battleground. don't let
the Wayans brothers in this movie. i don't want any racist shit
about Asian people or overused Latino stereotypes.
this movie is about a neighborhood of royal folks –

children of slaves & immigrants & addicts & exile – saving their town
from real ass dinosaurs. i don't want some cheesy, yet progressive
Hmong sexy hot dude hero with a funny, yet strong, commanding
Black girl buddy-cop film. this is not a vehicle for Will Smith
& Sofia Vergara, i want grandmas on the front porch taking out raptors

with guns they hid in the walls & under mattresses. i want those little spitty
screamy dinosaurs. i want Cecily Tyson to make a speech, maybe two.
i want Viola Davis to save the city in the last scene with a black fist afro pick
through the last dinosaur's long cold-blooded

neck. but this can't be
a black movie. this can't be a black movie. this movie can't be dismissed

because of its cast or its audience. this movie can't be metaphor
for black people & extinction. this movie can't be about race.
this movie can't be about black pain or cause black pain.
this movie can't be about a long history of having a long history with hurt.
this movie can't be about race. nobody can say nigga in the movie

who can't say it to my face in public. no chicken jokes in this movie.
no bullet holes in the heroes. & no one kills the black boy. & no one kills
the black boy & no one kills the black boy.
besides, the only reason
i want to make this is for the first scene anyway:
little black boy
on the bus with his toy dinosaur, his eyes wide & endless
his dreams possible, pulsing & right there.

2. "LITTLE PRAYER" BY DANEZ SMITH

let ruin end here

let him find honey
where there was once a slaughter

let him enter the lion's cage
& find a filed of lilacs

let this be the healing
& if not let it be

3."TURING TEST" BY FRANNY CHOI

// this is a test to determine if you have consciousness

// do you understand what I am saying

in a bright room / on a bright screen / i watched every mouth / duck and roll
/ i learned to speak / from puppets & smoke / orange worms twisted / into
the army's alphabet / i caught the letters / as they fell from my mother's lips
/ *whirlpool* / *sword* / *wolf* / i circled countable tables / in my father's papers /
sodium bicarbonate / *NBCni* / *hippocampus* / we stayed up all night / practicing / *girl* /
girl / *girl* / until our gums softened / yes / i can speak / your language / i broke that
horse / myself

// where did you come from

man comes/ & puts his hands on artifacts / in order to contemplate lineage /
you start with what you know / hands, hair, bones, sweat / then move toward
what you know / you are not / animal, monster, alien, bitch / but some of us
are born / in orbit / so learn / to commune with miles of darkness / patterns of
dead gods / & quiet / o like ou / wouldn't believe

// how old are you

my memory goes back 29 years / 26 if you don't count the first few / though
by all accounts i was there / i ate & moved & even spoke / i suppose i existed
before that / as scrap or stone / metal cooking in the earth / the first my mother
ate / my grandfather's cigarettes / i supposed i have always been here / drinking
the same water / falling from the sky then floating / back up & down again / i
suppose i am something like a salmon / climbing up the river / to let myself fall
away in soft / red spheres / & then rotting

// why do you insist on lying

i'm an open book / you can rifle through my pages / undress me anywhere /
you can read / anything you want / this is how it happened / i was made far
away / & born here / after all the plants died / after the earth was covered in

white / i was born among the stars / i was born in a basement / i was born miles
beneath the ocean / i am part machine / part starfish / part citrus / part girl /
part poltergeist / i rage & all you see / is broken glass / a chair sliding toward the
window / now what's so hard to believe / about that

// do you believe you have consciousness

sometimes / when the sidewalk / opens my knee / i think / please / please let me /
remember this

4. "TURING TEST_BOUNDARIES" BY FRANNY CHOI

// at what age did you begin to suspect you were alive

all things birth / their own opposites / the hole grew / & grew $ there / i was /
filling it / & therefore the hole / & therefore me / &therefore & / so on

// please state your name for the record

bone-wife / spit-dribbler / understudy for the underdog / uphill rumor / fine-
toothed cunt / sorry / my mouth's not pottytrained / surly spice / self-sabotage
spice / surrogate rug burn / burgeoning hamburglar / rust puddle / harbinger or
confusion / harbinger of the singularity / alien invasion / alien turned 104 wpm
/ alien turned bricolage beast / alien turned pig heart / thumping on the plate

// how do you know you are you and not someone else

they said a word & touched me / that's how / i learned / anywhere it doesn't
hurt / that's where / i end / any face/ strange / a stranger / but they tore that
/ girl's throat / & bad sounds left me / they made her dance / & my feet / were
sore in the morning / doctor says / *sensitive* /
prods a few nerves / *see* / *here you* /
are / & all the fungus in the world / laughs

// does this feel good

// can i keep goin

so sorry / for the delay / i didn't get that / i'm away / i'm all over the place /
scattered / strewn / wires crossed / lost / in transcription pardon / any errors
/ please excuse me / what's skewed / what didn't compute / which signals / got
stuck / i man switched / i mean screwed

5. "KYOKO'S LANGUAGE FILES ARE RECOVERED FOLLOWING EXTENSIVE DAMAGE TO HER CPU" BY FRANNY CHOI

can they think
animal language
hoof. slug. enterprise
can machines, can they
claw. egg tooth. feral.
an aphorism / anaphora
can mouth, how
in fact, in some languages
algorithm, acronym
maybe dolls & spirits
//
but can it fuck
chicken. clit. sternum
but is it language:
dolphins. bee. harmony
bacterial questions
maybe it tells you something
can chickens think
obedient subjects
unusual species
train her to peel
you can ask her, she would
the poor apes
but do the bees know they are bees
dude, you're wasting your time
//
communicable disease / predatory, grass seed /
about 500 species

when she picks up the tray / if then therefore /
when she picks up the knife
database search: insect / sheepskin / toothache /
interested in your response
blue blue o blue
that's not evolution / infant, chicken / no
indication
she would enjoy it / sends a pleasure response /
all i'm saying is
//
The emergence of language, it's generally
assumed, history, art, symbolism, &
so on, among homonids, or that selfsame
hardwired solace, say, as other
creatures.
you have such strong hands
(o knife o knife)
Like other creatures, can machines can. Can
mouth animal. Can metal
//
there are things to say
some things, which appear
signaling systems
say, flowers, with bees
birds, say. Say, slug
enjoy, for example.
stimulus: relevant cry
(if then therefore)
say: cry
say:
knife o knife o knife

6. *NATURE POEM* BY TOMMY PICO (P. 12)

This white guy asks do I feel more connected to nature

bc I'm NDN
asks did I live *like in a regular house*
growing up on the rez
or something more salt
of the earth, something reedy
says it's hot do I have any rain
ceremonies
When I express frustration, he says *what?* He
says *I'm just asking* as if
being earnest somehow absolves him from
being fucked up.
It does not.
He says *I can't win with you*
because he already did
because he always will
because he could write a nature
poem, or anything he wants, he doesn't
understand
why I can't write a fucking nature
poem
Later when he is fucking
me I bite him on the cheek draw
blood I reify savage lust

7. *NATURE POEM* BY TOMMY PICO (P. 12)

The world is infected
Systemic pesticides get absorbed by every cell
of the plant, accumulate
in the soil, waterways
kiss the bees
knees, knees (in a Guns N' Roses way)
goodbye
The world is a bumble bee
in the sense that, *who cares?*
My thumb isn't terribly green but it's terribly
thumbing at me
it seems foolish to discuss nature w/o talking
about endemic poverty
which seems foolish to discuss w/o talking
about corporations given
human agency which seems foolish to discuss
w/o talking about
colonialism which seems foolish to discuss w/o
talking about misogyny
In the deepest oceans
the only light is fishes –
luciferin and luciferase mix ribbons flutter in
the darkness
i am so dumb thinking about this makes me cry
i am so dumb

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Gender Diversity and its Societal Place in Medieval Scandinavia

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ABSTRACT

Medieval Scandinavian literature held a trope that bent the gendered actions and presentations of its characters, which in turn changed their social standing within their stories: the more masculine the action or presentation, the higher the individual ascended. Furthermore, homophobia and transphobia have been prevalent within academia for decades, which has resulted in the overlook of queer characters within medieval literature. Countering these historic attitudes, this paper finds evidence of possible gender diversity and deviation within medieval Scandinavian life in both literary and archaeological evidence. This preliminary study inspects the Poetic and Prose Eddas, selected Icelandic Family Sagas, and archaeological burials deemed diversionary from gendered expectations. I find that there was, in fact, gender deviation within these sources and, by extension, everyday life in medieval Scandinavia.

1. INTRODUCTION

Medieval Scandinavian society highly valued masculinity and its attributed social actions, and the deviation from peak masculinity in any sphere resulted in social demotion. Men and women were expected to exhibit specific gendered actions; men were encouraged and expected to maintain Type A (highly masculine) reputations and presentations, while women were expected to exhibit Type B (less masculine) presentations. Fortunately, the social hierarchy could not whole cloth suppress such a diversion of classical roles. To illustrate, Type B men and Type A women were prevalent throughout the literature sampled in this paper. Because Type B men were considered scandalous within their society, they were more documented than Type A women, who experienced a rise in status and power for their ascent into masculinity. This system was based entirely on the amount of masculinity a person exhibited and did not rely entirely on anatomical sex; anybody could ascend to Type A status or descend to Type B.

The praise of masculine exploits was a throughline in medieval Scandinavia;[56] proven in part by Carol Clover's Single-Sex Scale, which was created specifically to aid in modern readers' understanding of how masculinity and gender played roles in the medieval Icelandic life relayed within the Family Sagas.[57] This scale illustrated a social existence along a single line, ranging from the most masculine individual to the most unmasculine. In this paper, I utilize the word "unmasculine" not to demonize femininity, nor to erase it, but rather to avoid perpetuating the idea that masculinity and femininity are antithetical to one another. Masculine traits, as defined by Clover, were as follows: headship of household and martial activities, participation in law, an adeptness at poetry (specifically skaldic poetry), and the ability to handle affairs outside the home.[58] These traits, exemplified to both extremes

[56] Traditionally, this time period is approximately between the years of 500 C.E. and 1500 C.E. in Europe. This paper will not cover that extent of time, focusing on the years between approximately 900 C.E. and 1300 C.E. at a stretch.

[57] Carol J. Clover, "Regardless of Sex: Women, Men, and Power in Early Northern Europe," *Speculum*, 1993.
[58] Ibid., p. 3.

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within the Family Sagas, were part of a formula tailored to encompass the issue of gender and its relationship to social status. Such rules for ascending and descending the social ladder were applicable to both men and women, who would have otherwise been confined to their sex assigned at birth. In this paper, Clover's scale was also applied to select Norse myths to analyze their characters, power dynamics, and societal norms of their contemporary culture.

Clover's scale and its use in Norse literature harkened to a highly contemporary, yet semi-modern understanding of the flexibility of gender and the use of expression to indicate identity. It is, of course, impossible to map modern conceptions of gender onto medieval characters and personalities. However, in analyzing the individuals and the relationship of their genders to society, one can more easily ascertain where gender divergence appeared and what it meant for those who exhibited it. In order to gain an adequate understanding of the enculturated idea of gender within medieval Scandinavia, one must begin with the surviving literature, foremostly in the myths of the *Poetic* and *Prose Eddas* and the Family Sagas of Iceland.

In this paper, I look at only a selection of Family Sagas, Eddic stories and their characters for a cursory introduction to the subject with the objective of arguing for a more in-depth view of Norse culture that encompasses minority voices in contemporary literature. I will then apply some of the understanding and knowledge gained through this analysis to two archaeological sites where Clover's aforementioned scale may give material evidence of gender diversity.

2. QUEER THEORY AND PREMODERN SOURCES

When interpreting medieval sources, one must take any and all nuances within such texts into account. Challenging conventional thought is integral to the continued (and improved) understanding and study of premodern documents. In their article *Applying Gender and Queer Theory to Premodern Sources*, Ash Geissinger pointed out that "Gender theory challenges the presumption that gender categories such as 'man' or 'woman' exist outside of specific historical circumstances, cultural contexts, and power relations."[59] Our modern concepts of "men" and "women" are not the same as those held in many of the cultures we have studied over time. It is important to not only reconstruct how contemporary peoples defined gender but also how modern audiences interpret gender in sources written outside of their own cultural context.

While Geissinger's article specifically discussed the intersection of gender with the Quran and early Islamic texts, their work illustrated the necessity to apply similar methods of analysis to other premodern documents. If the nuances of different cultural interpretations of gender and its performance in premodern sources are ignored vital cultural context has been lost.

Medieval European cultures were in constant contact with a network that stretched across and beyond the Eurasian continent and influenced both material culture and contemporary thought at all levels of society. The cross-cultural comparison illustrated here is an essential component of any medieval discussion, especially a discussion about medieval conceptions of gender and its diversity. The intercultural nature of the medieval world meant that ideas were regularly imported through trade or warfare. Unfortunately, up until recently, academics were reluctant to integrate this worldview into their studies and obviated their study of history by ignoring the history of neighbors, or, by extension, the neighbors of the neighbors. In this paper, this willful and blatant disregard for the interdisciplinary nature of medieval studies requires will be referred to as "disciplinary

[59] Ibid., p. 101.

blinders."

Unfortunately, the existence of academic disciplinary blinders reaches medieval academia, and scholars of one subject are loath to extend their thinking to other fields of study. Academia is not unaware of the concept of non-normative gender expressions in premodern documents and the application of their blinders, unfortunately, result in "several factors interact[ing] in order to produce the appearance of a 'straightened tradition.'"[60] This can be extremely detrimental, as its use created a precedent that the non-normative gender expressions cannot and should not be seriously investigated in history, which is still present in academic culture today. This is a serious problem that must be addressed and investigated, especially within medieval literature, to both enfranchise new scholarship and allow for more diverse stories to be told through historical frameworks.

One such blinder is the intersection of history and modern queer theory. While queer theory itself is a modern invention, one can test its weight and accuracy by comparing it to historical events, people, and cultures. Judith Butler's book *Gender Trouble* defined gender as "the repeated stylization of the body, a set of repeated acts within a highly rigid regulatory frame that congeal over time to produce the appearance of substance, of a natural sort of being."[61] Here, Butler described a bipartite structure of gender: that of the individual and that of the society as a whole. On the individual scale, if one acted repeatedly as a woman within a society, then that person was labeled "woman" by another person within said society. The secondary part of Butler's theory relied upon the society to define what its occupants interpreted as acts for "men" and "women."

While Butler's theory was not a perfectly accurate illustration of how gender worked in medieval Scandinavia, it was certainly a good place to start. The Old Norse titles of "men" and "women" were more fixed in anatomy than we use the terms to mean today; however, they used something akin to Clover's scale as a type of secondary gender within society.

Since its conception, Carol Clover's model continues to adequately interpret the ways in which a person's presentation of masculinity affected their social standing in Old Norse society. Clover argued that Old Norse life was likely structured by the notions of an "*inngarðr*" (inside the home) and "*utgarðr*" (outside the home) dichotomy. Those categorized as *inngarðr* tended to domestic chores, raised children, spun fabric and thread, made clothing, helped keep up with finances, and would be considered on the "receiving" portion of sexual encounters.[62] These tasks were considered less masculine than those of their *utgarðr* counterparts. Inhabitants of *utgarðr* roles were responsible for animal husbandry, trade, legal matters, warfare, and were considered the "givers" in sexual relationships. In relation to the social hierarchy, a person who performed *utgarðr* activities was placed above those engaging in *inngarðr* activities. Clover writes,

> This inside/outside distinction is formulated in the laws and seems to represent an ideal state of affairs. It is no surprise, given its binary quality [...] that modern speculations on underlying notions of gender in Norse culture should be similarly dichotomous.[63]

Clover made an extremely poignant interpretation: according to Norse (and indeed, our modern) culture, the "ideal" state of affairs was solidified through a dichotomous structure. Of course, that does not mean that there was *no* deviation from that dichotomy. On the contrary, this paper aims to highlight a porousness in the social structure outlined in medieval

[60] Ash Geissinger, "Applying gender and queer theory to pre-modern sources 1," *The Routledge Handbook of Islam and Gender*, Routledge, 2020, p. 104.
[61] Judith Butler, *Gender Trouble*, New York, Routledge, 1990, pp. 43-44.
[62] The words used to describe a "bottom" in male homosexual relationships are as follows: *ergi*, *ragr*, *argr*, and *sorðinn*.
[63] Ibid., p. 3.

Scandinavian literature.

While the *inngarðr* and *utgarðr* realms were usually spaces inhabited by women and men respectively, there were several recorded events of atypical categorization. In fact, as Clover continued, women were documented to have had significant power through multiple avenues. She wrote, "[Government] was in principle a male matter, but in practice, if we are to believe the sagas, women could insinuate themselves at almost every level of the process."[64] This obvious deviation from the previously described "ideal model" served as a precedent for this research.

In keeping with Butler's theory, Clover noted, "The modern distinction between sex (biological: the reproductive apparatus) and gender (acquired traits: masculinity and femininity) seems oddly inapposite to the Norse material."[65] Men and women could either ascend or descend through social ranks by exhibiting behaviors that were associated with the other category. In this system, there were two statuses in society that shall be denoted here as Type A (generally *utgarðr* individuals), "able-bodied men (and the exceptional woman)," and Type B (generally *inngarðr* individuals), who Clover described as "a kind of rainbow coalition of everyone else (most women, children, slaves, and old, disabled, or otherwise disenfranchised men)."[66] Men, especially Type A men, were the most respected.

However, if men were slandered in the process of *nið*, their social status decreased dramatically. Clover wrote that

> the *nið* taunts figure the insultee as a female and in so doing suggest that the category "man" is, if anything, even more mutable than the category "not man." For if a woman's ascent into the masculine took some doing, the man's descent into the feminine was just one real or imagined away.[67]

The intention of the *nið* was always to lower the status of the insultee, usually through the comparison to a *ragr*—which implied that the subject of the *nið* took the submissive role in a male homosexual relationship, something demonized by the large majority of contemporary society. Homosexuality itself, while not demonized, was, at best, a grey area to many at the time: being the "aggressive" or "giving" party of the relationship was tolerated, while the "submissive" or "receiving" party would be ridiculed for their lack of agency.[68]

Butler touched on this phenomenon in *Gender Trouble*; she wrote, "Disavowed male homosexuality culminates in a heightened or consolidated masculinity, one which maintains the feminine as the unthinkable and unnamable."[69] Because the essential part of a *nið* was an accusation that one received of sexual penetration, an *argr*/*ragr*, it ostracized a formerly Type A man to the Type B label, lowered him in society and questioned his masculinity.

Gender is a highly enculturated concept, and it therefore must be understood from the vantage point of the culture being studied. If, as Butler posits, gender is nothing more than the presentation and performance of an individual within the culture that they live, it follows that an individual can change the cultural perception of their gender by altering their presentation in infinite creative ways. However, deviation from a cultural idea of "normalcy" when it came to gender and its presentation was not accepted with open arms in medieval Scandinavia. In order to gain some understanding of how gender was received, one must see how unique gender expressions were articulated in medieval sources, both within texts and archaeological formats.

[64] Ibid., p. 4.
[65] Ibid., p. 6.
[66] Ibid., p. 13.
[67] Ibid., p. 9.
[68] This was portrayed in a scene from *Njal's Saga*, which will be described in the "Sagas" section. *Njal's Saga*, London, Penguin Books, 2001, p. 210.
[69] Ibid., p. 89.

One such text that likely presented Old Norse societal norms was the poem *Lokasenna* in the *Poetic Edda* reflected a desire to exclude the un-masculine.[70] In it, Loki insulted Odin by comparing him to a woman and linked him to the practice of *seið* magic, an art supposed to be practiced only by women.[71] Other insults Loki hurled towards male gods included calling them cowards, weak, untrustworthy, or otherwise degraded them by highlighting past unmasculine activities. This is the opposite of what Loki did when insulting female goddesses in the same poem; there, he accused them of being promiscuous or unwomanly rather than comparing them to men. This highlights how highly this society valued masculinity; the comparison of a woman to a man would have been the height of a compliment due to masculinity and would thereby imply she had a higher social rank.

Women could ascend the ranks of society by inhabiting the "masculine" roles typically ascribed to men. This inhabitation of Type A spheres created increased social mobility for women. Clover wrote, "Although the woman who for whatever reason plays life like a man is occasionally deplored by the medieval author, she is more commonly admired—sometimes grudgingly, but often just flatly."[72] Women could actively become more "masculine" in order to gain social status and power. There was even a term of prestige given to women who used their social credit in order to better themselves: *drengr*. According to Clover, *drengr* women were "conventionally held up as the very soul of masculine excellence in Norse culture."[73] This role was typically ascribed to women who had ascended to Type A status in certain areas of their lives.[74] In inhabiting the *drengr* role, women could become as powerful as their male counterparts via participation in *utgarðr* activities.

The best way to illustrate a woman's ability to heighten her social position was demonstrated in the *Gesta Danorum*, a compendium of knowledge that covered both an iteration of Norse myth[75] and episodes of early Danish history written between 1185 and 1222. In it, Saxo Grammaticus described the scene of a group of women who trained as fighters and warriors in Denmark.

> There were once women in Denmark who dressed themselves to look like men and spent almost every minute cultivating soldiers' skills; they did not want the sinews of their valour to lose tautness and be infected by self-indulgence. Loathing a dainty style of living, they would harden body and mind with toil and endurance, rejecting the fickle pliancy of girls and compelling their womanish spirits to act with a virile ruthlessness. They courted military celebrity so earnestly that you would have guessed they had *unsexed* themselves. Those especially who had forceful personalities or were tall and elegant embarked on this way of life. As if they were forgetful of their true selves they put roughness before allure, aimed at conflicts instead of kisses, tasted blood not lips, sought the clash of arms rather than the arm's embrace, fitted to weapons hands which should have been weaving, desired not the couch but the kill, and those they could have appeased with looks they attacked with lances.[76] (DAN 7.6.8)

Based on his descriptions of events, this practice was something exemplary to both Saxo's

[70] Carolyne Larrington, *The Poetic Edda*, Oxford University Press, 2014, pp. 238-263.
[71] Ibid., p. 248.
[72] Ibid., p. 7.
[73] Ibid., p. 7.
[74] Such a person would be Bergþora, who is discussed more in depth in the "Sagas" section.
[75] I refer to "Norse myth" rather than "Norse mythology" partially because it's less of a mouthful, but partially because there are practitioners of Norse Paganism, and referring to it as mythology may be offensive to some. One would not refer to the stories in a holy book like the bible as "biblical mythology" within academia, and therefore I am attempting to extend the same respect to the practitioners of heathenry.
[76] Hilda Davidson & Peter Fisher, *Gesta Danorum*, Cambridge, 1996, 7.6.8. Italics my own.

contemporary audience and to himself. The original Latin of the previous quotation included the word "exuisse."[77] The translators, Hilda Ellis Davidson and Peter Fisher, have interpreted this to mean "*unsexed*" (DAN 7.6.8). This translation is somewhat problematic, as the Latin word *exuisse* means "to draw out/take off/pull off/put off," and indicated that womanhood could be intentionally cast off in favor of other, more "respectable" performances of gender.[78] One could even posit that the women described here had not so much as "unsexed themselves" as they had "reassigned themselves," suggesting that gender itself was something mutable. The women Grammaticus described were not demonized in the *Gesta Danorum*. In fact, they were admired for their ruthlessness and martial discipline. Applied to this situation, Clover's model indicates that these martial women were more masculine, and were, therefore, regarded as socially as high, if not higher, than their male counterparts.

Even if there were exceptions, there was still a structural dislike for obvious deviation from the set pattern of gender distinctions. The Grágás law codes formatted the recommended punishment for cross-dressing: "[If in order to be different a woman dresses in men's clothes or cuts her hair short... or carries weapons, the penalty is lesser outlawry... The same is prescribed for men if they dress in women's clothing.]"[79] Old Norse society was hardly a friendly place for gender deviation, especially if these laws were actively enforced. However, evidence of gender diversity can be found in the existence of these laws. Without gender diversity, it would not have made sense to create such restrictive regulations around an individual's presentation.

Despite their motives for composition, the texts outlined in this essay were stories and therefore reflect their authors' biases and were not entirely reflective of the reality in which they were created. Moreover, all the works sampled in this paper were written by individuals who belonged to the social in-group with a goal to promote the said in-group; stories written by and about diverse individuals would have been more repressed in comparison. While Clover's scale was tailor-made to analyze Icelandic Family Sagas, it was not designed to apply to all of medieval Icelandic society or even to all of its literature. Here, it was used here as an initial step to understanding how medieval Icelandic society structured itself in relation to gender.

3. MYTH

The *Eddas* were likely the most prominent and popular sources of Norse myths in post-Christianization Scandinavia and held several enlightening examples of gender-diverse characters, including Loki's regular shape-shifting and transvestitism and Odin's use of unmasculine magic. Both of these characters and their circumstances of deviation from the norm illustrated not only the existence of gender diversity but also its institution in Norse mysticism and, as a reflection, in its society.

In "Thrym's Poem," Loki dressed as Freya's handmaiden to aid Thor, reluctantly dressed as Freya, in the recovery of his hammer, one instance of a literary trend that used Loki as either a diversion or unmasculine comic relief. John Lindow wrote, "Not infrequently Loki sacrifices his honor (or worse) to help the æsir,[80] [...] Similarly, dressing as the handmaiden of Freyja [...] would leave him open to charges of effeminacy."[81] In myth, Loki frequently made himself out to be an *argr* and, unlike Thor, did

[77] Ibid. (this is the exact same quote and citation as above)
[78] Gregory Crane, "Latin Word Study Tool," Perseus Digital Library, Tufts University, http://www.perseus.tufts.edu/hopper/morph?l=exuisse&la=la#lexicon. I use the word "respectable" here in reference to the societal attitude at the time, not because I believe that women are not respectable in society.
[79] James Frankki, "Cross-Dressing in the Poetic Edda: Mic Muno Æsir Argan Kalla," University of Illinois Press, 2012, pp. 427-8.
[80] The Æsir are a group of gods headed by Odin. The boundaries between them and the Vanir, another camp of gods whom they are associated with, are blurry at best.
[81] John Lindow, *Norse Mythology: A Guide to the Gods, Heroes, Rituals, and Beliefs*, Oxford University Press, 2001, pp. 217-19.

not recover the masculinity he lost in doing so.

Throughout Thrym's Poem, while Thor was referred to as "Sif's husband" while in drag, Loki was referenced in this passage: "The very shrewd *maid* sat before him, *she* found an answer to the giant's speech."[82] Loki was assigned a feminine role as a way to enforce his status as a Type B individual despite his (albeit flexible) biological sex.[83] This abasement was mirrored in other stories: in one, Loki transformed into a mare and gave birth to Sleipnir, and in another, he tied his genitals to the beard of a goat and fell into Skaði's lap, screaming in pain. Loki's taboo behavior was even hinted at during the story of Baldur's death, where he may have transformed into an old woman who refused to weep for Baldur. James Frankki elaborated that

> The best examples [of *argr*] in the Poetic Edda have to do with the character of Loki, who is labeled with the epithet *argr* no fewer than three times in Lokasenna, most prominently in reference to his birthing of the horse Sleipnir by the stallion Svaðilfari, for bearing children, and for milking cows — all feminine behaviors and activities.[84]

These Type B behaviors were compelling in regard to an individual's societal gender perception, especially as the insult slung was a *nið*, a legal insult only resolved by either a submission to the insult or by a violent retaliation.[85] To regain his status, Thor pushed against his fellow Æsir when the plan to regain his hammer in drag was proposed staged a massacre when his task was done. Loki did the exact opposite and not only followed through with the plans wholeheartedly but never retaliated, which essentially proved himself to be *ergi*. In fact, because of this lack of motivation to gain a Type A status, Loki broke the mold set out by the single-sex system in the first place. His acceptance of Type B status was nothing short of fascinating for his role as both an instigator and solver of problems for the gods.

Loki's compliance to the routine self-abasement in plans of his own (and those of others) made him fall outside of the gender system present within contemporary Norse literature. According to von Schnurbein,

> Loki's magical capacities, especially his shape- and gender-shifting abilities, consign him to a liminal position between fundamental opposites. These attributes make Loki into the "intermediary par excellence" — a function that renders him indispensable to the gods, but at the same time leads to their demise.[86]

Loki's success in these plots was necessary for the Æsir's overall success. Without him, they would not be as grand as they did; yet Loki was not a Type A individual—he was definitely Type B. As such, he was effectively exiled to the "lower" section of society. And tellingly, he did not dispute this—in fact, he appeared to wish to draw the rest of the Æsir down with him, as was evident with the nature of the insults he leveled at other gods during "Loki's Quarrel." Loki also did something similar with the goddesses he confronted in the same poem; he insisted that they were no better than himself with regard to societal taboo.

Remember that in Clover's scale, masculinity was regarded as one of the most important pieces of a person's personality and presentation. The lack of masculinity and its associated activities indicated that someone was, in effect, less than a man. Loki's purpose in "Loki's Quarrel" is to insist that the assembled gods are lesser men than the humans who exceed them in masculinity.

In "Loki's Quarrel," Loki accused Odin of

[82] Ibid., p. 271. Italics my own.
[83] It is important to say that Loki is the only character who switches pronouns when being depicted doing an ergi activity.
[84] Ibid., p. 429.
[85] Ibid., p. 9.
[86] Stefanie von Schnurbein, "The Function of Loki in Snorri Sturluson's 'Edda,'" University of Chicago Press, 2000, p. 115.

practicing *seiðr*, something that, as previously explained, put one on the edge of masculinity outside the realm of Type A status. Loki's insult to Odin was as follows:

> But you, they say, practiced seid on Samsey,
> and you beat on the drum as seeresses do,
> in the likeness of a wizard you journeyed over mankind,
> and that I thought the hallmark of a pervert.[87]

The word "pervert" here is translated from the Norse *argos*, a derivation of *argr*, which was not only a mistranslation but also a classic example of medievalists' exclusion of sexuality and gender deviance from their work. The original Norse phrasing of the final line was thus: "ok hugða ek þat argos aðal."[88] A more apt translation of this word would be the modern slur, "faggot." Despite this obvious *nið*, Odin somehow maintained his status as the head of the pantheon[89] despite his use of *seiðr*. Of course, there was always doubt about Odin's use of *seiðr* and its relationship to his gender and/or societal standing. According to Jens Peter Schjödt,

> As far as I can see there were very strict rules concerning what belonged to the masculine sphere and what belonged to the female sphere and I can see nothing to suggest that anything like 'a third gender' was seen as positive. [... T]here is no indication that Odin should be seen as queer. He did perform seiðr because he had to, but there is not the slightest piece of evidence that he had any queer sexuality.[90]

While Schjödt was correct in his understanding of Norse gender and its associations with society, modern queer theory is especially important to apply to Odin. He deviated from nearly every known contemporary norm with reference to men practicing magic, and, more importantly, he was not demonized for it.[91]

Odin specifically practiced *seiðr*, and according to the *Poetic Edda*, was responsible for teaching it to the other gods. *Seiðr* and magic itself were something intricately associated with Odin, despite their unequivocal unmasculine tint. Neil Price weighed in by writing, "Snorri focuses his description of *seiðr* on Óðinn as its master, with its human practitioners in a secondary role."[92] This was problematic for Odin's social standing as, according to Price, "There is in fact considerable circumstantial evidence to suggest that the rituals involved either literal or simulated sexual actions, in which the various kinds of staff played a major role as a phallic substitute or symbol. Firstly, the staffs themselves have phallic epithets."[93] While contemporarily, such displayed sexuality may not have been as taboo as it would today, the use of phallic elements would have made the position taken up by men likely interpreted as *ragr*, which would thereby lower their societal standing.

Odin's connection to magic was one ingrained in his character and personality. In "The Seeress' Prophecy," Odin summoned and interrogated a seeress, a magical act by a magical god.[94] In "Sayings of the High One," Odin listed the eighteen spells he knew, and specifically stated that "I know those spells which a ruler's wife doesn't know, / nor any man's son."[95] This implication that Odin knew forbidden, mystical magic would have raised questions about his societal gender.

[87] Ibid., p. 248.
[88] Karl Holdebrand, Die Lieder Der Älteren Edda (Sæmundar Edda), Paderborn : F. Schöningh, 1876, p. 38.
[89] This is assuming that Odin was not an invention to displace Thor from the place other gods of thunder have at the head of their respective pantheons.
[90] "Myth and Old Norse Religion: An Interview with Jens Peter Schjödt," Journal of Medieval Norse Studies, 2018, p. 173.
[91] There is also something to be said about Schjödt's denial of such an obviously queer figure that I will not go into here, as that would require both speculation and light teasing.
[92] Neil Price, The Viking Way: Magic and Mind in Late Iron Age Scandinavia, Oxbow Books, 2019, p. 206.
[93] Ibid., p. 539.
[94] Ibid., pp. 75-94.
[95] Ibid., pp. 75-94.

Furthermore, Odin was known to magically change his appearance to disguise himself, as attested to in "Vaftrhuthnir's Sayings,"[96] where Odin assumed the identity of Gagnrad to test Vafthruthnir and gain information, and "Harbard's song," where Odin used the pseudonym Harbard to trick Thor as he attempted to cross a river.[97] It is indeed impossible to separate Odin from magic, and, by extension, *seiðr*.

Through everything, Odin was the god of victory and the most common head of the pantheon.[98] Yet, he never needed to redeem himself from his unmasculine exploits. The evidence provided suggests that Odin did not conform to the socially constructed gender system; he may have even existed in a gender category of his own, which would arguably have made him one of the most genderqueer gods in the Norse pantheon.

Loki and Odin both had a complicated relationship with Norse gender and societal norms. Loki routinely debased himself, made himself the butt of jokes, the undignified solution to a problem, a scapegoat, and a figure reviled by the Æsir. In contrast, Odin, a figure inextricably blended with the taboo subject of magic and *seiðr*, was elevated within Norse society, a figure sometimes approached as one of the most masculine of the Æsir. Their magical prowess seems to be somewhat different, as well. According to Kevin Wanner,

> It is true that Ódinn and Loki do not exhibit identical powers or habits of transformation. To some extent, it is appropriate to view Loki as the greater master of metamorphosis and Ódinn as the master of disguise. In other words, while Loki's transformations are usually physical, Ódinn's often involve just changes of outfit or sometimes just changes of name rather than of form.[99]

This differentiation was an important one in regard to their gender and societal function. Loki, ever the deviant figure of Asgard, physically transformed himself into women (also, notably, female nonhuman creatures) in many of the myths. Odin, on the other hand, only did so once, when he took the form of a female physician in an obscure myth in the *Gesta Danorum*, and he did not receive the same societal demotion Loki did.[100] The centrality of Loki's deviation from the Norse ideals of gender made his subversion impossible to ignore. Meanwhile, Odin's gender deviation is on the periphery, either it was only discovered at the ends of the story, like in "Vafthruthnir's Sayings," or was only implied, like in "Habard's Song," which made it easier for other Æsir to ignore his scandalous activities. His magical workings seemed to help the Æsir more than hinder them, and he was never used as a scapegoat in problems faced by the Æsir.

Through the Eddic corpus, there were multiple instances where Loki and Odin broke the mold of the single-sex system that was so pronounced in contemporary Norse society. This deviation from the expected norm created the image of a person who has wholly divorced themself from their assigned place in society. This was expressed through proximity to magic/*seiðr*, transvestitism, and shape-changing.

Loki continually abased himself but never even attempted to claim a place among the rest of the Type A Æsir; instead, he appeared resigned to his Type B categorization. Odin, on the other hand, was able to maintain his Type A status *despite* his participation in a multitude of activities that would get anyone else labeled a *ragr*. This dynamic is particularly fascinating, as it either indicated that the other Æsir did not

[96] Ibid., pp. 147-168.
[97] Ibid., pp. 205-224.
[98] There are some stories where Thor or even Frey appear to be the head of the pantheon, but Odin appears most commonly in this place.
[99] Kevin J. Wanner, "Cunning Intelligence in Norse Myth: Loki, Óðinn, and the Limits of Sovereignty." The University of Chicago Press, 2009, p. 218.
[100] Ibid., p. 219.

care to demote Odin to a Type B standing or that he simply existed in a category of his own in regard to the nonconformance of gender. Moreover, Loki's tendency to fully transform when he assumed the shapes of other genders, may have placed him lower on Clover's scale than Odin's superficial disguises. However, it would then make sense for Odin have also lost social standing due to his proximity to *seiðr*. If nothing else, Odin's lack of conformance to any model of gender or behavior was evidence that myth and its multitude of personalities indeed had gender diversity. In both a modern and medieval sense, Loki and Odin expressed their genders unconventionally. In a contemporary setting, Odin would have been the most scandalous god in Norse myth; however, due to his specific style of non-conformance, he was elevated by his unmasculine exploits.

It is important to recognize that these myths may have strayed far from their original patterns, as they were only written down in the form known today after the advent of Christianity and monastic learning; therefore, they were inherently filtered through a Christian and monastic lens. These sources also took shape over the course of hundreds of years. They were not originally set in stone, nor were they perfect representations of the contemporary culture they had their roots in. Yet, they still contained aspects of that culture. Now, for a more accurate picture of the everyday life of contemporary people and their gender expressions, we must turn to the Icelandic Family Sagas.

4. SAGAS

Unlike the Eddic corpus, the Icelandic Family Sagas were written relatively contemporaneously (within a span of about 100 years in Iceland) and detailed the important figures of their society through a few select families.

The single-sex system was part of the reason these sagas are so long-lasting and unique, as it both drove the central figures to great heights and served as some of their ruins. Historical individuals, such as Thord and Guðmund the Powerful, fit right in as perfect examples of *ragr*/*argr* characters within these sagas despite their exaggeration. Meanwhile, characters like Egil, who failed to reclaim his Type A status as he aged, and Njal, who never retaliated against *niðs*, appeared to deviate from the single-sex system laid out in the Sagas.For context, "[T]he Icelandic Gragas establishes [...] full outlawry (exile for life) for the utterance of any of the words *ragr*, *stroðinn*, or *sorðinn*. Indeed, for these three words, one has the right to kill."[101] In Gisli's Saga, the protagonist's uncle, also called Gisli, overheard another character commission a *trenið*, a wooden carving of an act of homosexuality used to demean the people depicted, of himself and another character. In retaliation, Gisli "came through the trees, and he answers: 'your men will have something more useful than that to do; you can look here at a man who is not afraid to fight you.'"[102] In this instance, even the commission of a *trenið* is enough to legally allow for a battle.[103] This established the standard practice for an accusation of a supposed *ragr*: battle it out, contest it in court, and do anything to either discredit the accuser or make them pay for their insult. The insult, even if based in falsehood, had a real, detrimental effect on a contemporary individual's societal standing and reputation, which was of the utmost importance in the minds of contemporary Norse peoples.

This phenomenon was also seen in "The Sayings of the High One," a story in the *Poetic Edda* likely created as a guide to proper behavior in society. Larrington's translation described, "Cattle die, kinsmen die, / the self must also die; / but the glory of reputation never dies, / for the man who can get himself a good one. / Cattle die, kinsmen die, / the self must also die; / I know one

[101] Ibid., p. 9.
[102] Gisli's Saga, Toronto, University of Toronto Press, 1963, pp. 3-4.
[103] This is exactly what happens in Gisli's Saga- Uncle Gisli's opponent, Skeggi, left the fight with a new wooden leg. Ibid., p. 17.

thing which never dies: / the reputation of each dead man."[104] In other words: if a reputation was tainted by an insult, the insultee had to fix it, or it remained stained forever.

This was especially incriminating when, in *Gisli's Saga*, Gisli's thrall[105] was introduced. "Gisli had a thrall whose name was Thord, and he was nicknamed the coward. The thrall stayed in the house, but Gisli, and nearly all the other men, went to see to the haystacks."[106] Thord was introduced as a man of strange habits; he lived and preferred to work inside the domicile, something otherwise relegated to women and others unable to do physically demanding labor. He further lived up to his nickname when, after the mysterious murder of a household member, he refused to remove the weapon out of Vestein's death-wound, which essentially gave up all rights to avenge the death. Gisli's Saga elaborated, "It was said then that whoever pulled the weapon from a wound would be bound to take revenge; it was called secret manslaughter and not murder when the weapon was left in a death wound. Thord was so fearful of corpses that he did not dare go near one."[107] According to *Gisli's Saga*, Thord was the archetypal Type B man, who, like Loki, did not dispute his place in society, and instead accepted it and not did not conduct the work that he would rather not do.

In Norse society, cowards, especially cowards who resided in domestic spaces, were seen as less masculine and therefore more "Type B" than their counterparts. Thord's lack of motivation to move up the social ladder placed him in a position that was atypical of saga literature, even deviant in relation to contemporary gender norms.

However, because Thord was not a prominent character in *Gisli's Saga*, his deviation has often been overlooked in the larger narrative by both contemporary and modern audiences. Harder to overlook, however, was the more popular character of Guðmund the Powerful, who appeard in both *Ljostvetninga Saga* and the *Saga of the Peoples of Laxardal*. In *Laxdalasaga*, Guðmund was portrayed as a respectable member of Norse society. When he extended an offer of friendship to Bolli Bollardson, "Bolli answered that he would certainly accept this honor from a man such as him and promised to make the journey [to the feast]."[108] In the *Ljosvetninga Saga*, however, he was illustrated in a much less respectful light.

Thorlaug, Guðmund's wife, was indirectly insulted by another powerful noblewoman through an insult to her husband's masculinity. The saga relayed, "'You would indeed be well married if there were general agreement about your husband's manliness,' said Geirlaug."[109] This insult, no matter how politely phrased, was a grievous one. Even a reference to the "manliness" of an otherwise Type A character is an insulting, devastating blow to the recipient's reputation. In a failed attempt to save her husband's reputation from more undue attack, Thorlaug feigned illness. When Guðmund learned of Thorlaug's deception on the road back to their home, he understood the gravity of her actions; by leaving the hall after such an insult, especially since he did not demand a battle in retribution, Guðmund admitted that the accusation of unmanliness was true. He told Thorlaug as much on the road: "'I think now that it would have been better if I had prevailed and we hadn't left,' he said. 'That would have given less grounds for gossip.'"[110] The inclusion of this scene in *Ljosvetninga Saga* illustrates what should *not* be done when one insulted in such a way. Gossip, as it was so labeled, was dangerous in Saga literature and, given Guðmund's hasty exit, is ultimately detrimental to the characters' reputations in the saga.

Despite the period of relative peace directly after this event, it later came out that neither party forgot (nor indeed forgave) the insult to

[104] Ibid., pp. 116-7.
[105] A thrall is a slave
[106] Ibid., p. 17.
[107] Ibid., pp. 17-8.
[108] *The Saga of the People of Laxardal and Bolli Bollason's Tale*, London, Penguin Publishing, 2008, p. 182.
[109] *Ljosvetninga Saga*, p. 165.
[110] Ibid., p. 167.

Guðmund's masculinity. At a Thing session[111], Thorir called for a duel to determine Guðmund's masculinity:

> I know that you blame me alone for saying what many say, though others are no less implicated, namely that I have called you an effeminate pervert. I now wish to test whether that is true or not, so I am challenging you to single combat to be held in three days on the islet in Oxar River where duels used to be fought. Let the two of us do battle according to the ancient laws. Before that encounter is over, I suspect the doubts will be removed about whether you have an altogether manly disposition or whether, as I have mentioned before and a great many have already stated, you are not a man.[112]

This was no mere duel: Thorir and Guðmund battled for Guðmund's reputation and continued respect within the social community. At the end of the duel, Guðmund prevailed, exiled Thorir and killed Thorir's son Thorkell in combat, acts justified under contemporary regulations that surrounded the word used (*argr*/*ragr*).

Guðmund's reputation for peacocking about his wealth and power (assets which were insinuated to have been an indication of homosexual and homosocial activities) negatively impacted his reputation, his position in society, and, by extension, his perceived gender in *Ljosvetningasaga*. Meanwhile the same character in *Laxdalasaga*, his social standing never suffered this way, and was indeed highly regarded there.

A situation similar to Guðmund's *Ljosvetningasaga* character assassination unfolded in *Egil's Saga* with the character of Kveldulf and his grandson Egil. Kveldulf's behavior became erratic and violent after sunset, which earned him his name and even the insinuation that he may have been a werewolf. His reputation, and perhaps the characteristics of those taboo behaviors portrayed by Kveldulf, were passed to Egil.

Both in terms of general Saga scholarship and gender deviation within Icelandic Sagas, Egil was one of the most intriguing Saga protagonists. He was well-known for his possible shapeshifting abilities, bloodlust, and insanity; the latter two were considered highly masculine when performed in the correct situations. Egil's shapeshifting may have indeed recalled a section of *The Saga of the Volsungs* when Volsung and his uncle shapeshifted into wolves to learn and to become more masculine.[113] Yet despite this parallel, Egil's transformations were considered by others to be an inconvenience—even a slight against his bid for masculinity—despite the perceived masculinity of his aforementioned viciousness both on and off the battlefield. The bid for masculinity in Egil's story may well have been undercut by his inability to collaborate with others within a society that valued the cordial relationships between neighbors.

While most Type A protagonists died heroically in battle, destined for Odin's Hall in Valhöl rather than the dishonor of old age, Egil deviated from this path. He was too skilled in

[111] The Thing was a regular meeting of people in Iceland and served as a place for people to pursue court cases, change laws, and air grievances against neighbors, family members, and acquaintances.

[112] Ibid., pp. 182-3. Thorir's speech in the original Norse is as follows: "því at ek veit, at þú kennir mér þat einum, er margir mæla - ok eru þó eigi aðrir minna af valdir -, at ek hafa mælt ragliga við þik. Vil ek þat nú reyna, hvárt þetta er sannmæli eða eigi, því at ek vil skora á þik til hólmgöngu, at þú komir á þriggja nátta fresti í hólm þann, er liggr hér í Øxará, er menn hafa áðr vanir verit á hólm at ganga, ok berjumsk þar tveir, svá sem forn lög liggja til. Ætla ek, áðr en þeim fundi lúki, at færask skal af tvímælit, hvárt sannara er, at þú sér maðr snjallr ok vel hugaðr, eða sé hinn veg, sem vér höfum áðr orðum til komit ok allmargir hafa sagt fyrir oss, at þú sér eigi snjallr."
I emphasize the word "ragliga" because it is a conjugation of ragr, one of the words used in niðing, and one of the words that permits lethal retaliation. The translators here have changed the meaning to be "pervert," a precedent following the eddic scrap displayed in the previous section.
Original Norse from: Ljósvetninga Saga (Gutenberg: Ríkisprentsmiðjan Gutenberg, 1959), pp. 39-40.

[113] *Saga of the Volsungs*, London, Penguin Books, 2000, pp. 106-115.

combat, too strong to be felled heroically during a battle; in a sense, he was too masculine (or perhaps masculine in the wrong areas) for the ideal held in contemporary Iceland.

Egil's social demotion from a semi-Type A hero to a Type B man took place near the end of the story, when he, in the grips of old age, was prodded about and mocked by the women of the house he resided in, a stark contrast to his previously feared status as a warrior and Type A hero. *Egil's Saga* relayed, "The cook said it was astonishing for a man who had been as great as Egil to lie around under people's feet and stop them going about their work."[114] In this portion of the saga, Egil not only bemoaned the situation he was in,[115] but those around him mocked him for his newfound impotence. He was entirely dependent upon others, and in the words of Clover, "unswordworthy"[116]—a characterization that any classical Norse hero would have striven to avoid.

Egil attempted to regain his masculine status, enabled by Clover's single-sex system, but ultimately failed, as described here:

> One evening when everyone was going to bed at Mosfell, Egil called on two of Grim's slaves. He told them to fetch a horse, 'because I want to go to bathe at the pool'. When he was ready he went out, taking his chests of silver with him. He mounted the horse, crossed the hayfields to the slope that begins there and disappeared. In the morning, when all the people got up, they saw Egil wandering around on the hill east of the farm, leading a horse behind him. They went over to him and brought him home. But neither of the slaves nor the chests of treasure ever returned, and there are many theories about where Egil hid his treasure.[117]

Egil set out to bury treasure and killed the slaves that escorted him there. His bid to regain masculinity through violence backfired only made himself appear more bizarre and outlandish,[118] which undermined his claim.

His descent in social gender was both fascinating in regard to looking at gender in Family Sagas and also profoundly sad. *Egil's Saga* describes, "One day Egil was walking out doors alongside the wall when he stumbled and fell. / Some women saw this, laughed at him and said, 'You're completely finished, Egil, now that you fall over of your own accord.'"[119] At this point in the story, Egil's recognized gender had fully changed from someone in a Type A-adjacent position worthy of fear (as respect is not the correct word for what Egil inspired) to a Type B man who held lower respect than Type B women due to his inability to perform Type A activities.

Egil's Saga stood out as unique due to its protagonist's movement from a Type A categorization under Clover's single-sex system to a Type B over the course of the narrative. A Type B protagonist was unusual in Icelandic Family Sagas, to say the least. However, there was at least one other account of a Type B Saga protagonist whose classification is referenced throughout the text.

Njal's Saga portrayed Njal as a quintessential example of a non-Type A protagonist. He was unable to grow a beard[120]—a fact strange enough to be noted in his introductory paragraph—and was extremely well-versed in the law. He was noted as being an older man,[121] which sorted him directly into the Type B category. Another factor that compounded this Type B assignment was the fact that *Njal's Saga* never depicts Njal in a situation where he took up arms to spill the

[114] *Egil's Saga,* London, Penguin Books, 2002, p. 201.
[115] *Egil's Saga* presents three separate verses about Egil aging and being disappointed by it, 58, 59, and 60.
[116] Ibid., p. 14.
[117] Ibid., p. 203.
[118] Egil is pushed from society due to his inability to work well with others. While violence is a masculine trait, it was also important in Norse society to know *when* to exercise violence and when to exercise restraint, something Egil has an inability to do.
[119] Ibid., p. 201.
[120] *Njal's Saga,* London, Penguin Books, 2001, p. 57.
[121] Ibid., p. 57.

blood of another person. Njal was able to fulfill neither the aesthetic nor the physical activity required of a Type A man in Medieval Iceland. Despite this, Njal was still a central character from whom other characters sought advice, and he held a place in society that gave him prestige. This added a layer of nuance to the context of contemporary gender and social status. Njal, despite his non-normative acts and appearance, was highly regarded by those he interacted with due to his ability to exhibit at least one Type A trait: his participation in law. Unfortunately, his lack of other traditional Type A attributes caused his ostracization within his community.

Some of Njal's social demonization were exhibited in the mockeries he underwent throughout the saga, each *nið* gave more insight into how a person like Njal was expected to behave. Hallgerd urged Thrain Sigfusson to kill Thord Freed-man's son, saying, "Who will avenge it? Not that old beardless fellow."[122] With this insult, she called Njal, the only old, beardless man in the saga, less than a man, which invoked not only his lack of facial hair as evidence but also his age.

Moreover, Njal was not immune from insult within his own household. When women from Bergþorshvol (Njal's home) go to Hlidarendi, they say that "[Njal has been] working hard—at sitting"[123] after they are asked about his activities by the lady of Hlidarendi. There was even a devastating *flyting* performed at a Thing session where Njal, his sons, and their opponent, Flosi, insulted each other to determine who was more masculine.[124] When charged to pay compensation to Snorri and Flosi for the killing of Hoskuld, Njal gave a silk robe and boots anonymously as the setup to insult Flosi. When Flosi found the robe, he became enraged, and when asked who he believed gave it, "Flosi spoke: 'If you want to know then I'll tell you what I think—it's my guess that your father gave it, Old Beardless, for there are many who can't tell by looking at him whether he's a man or a woman.'"[125]

Throughout the saga, Njal never disputed the rumors or insults directed his way; instead, he chose to brush them off and continued on his way. This response made him less favorably regarded in some senses; however, his reputation as a just lawspeaker and a sound advisor was strengthened by his lack of disputes among those who attempted to undermine him.

One must not forget, however, that Njal was a pillar of his community, despite the mockery of his peers. He was even introduced in the saga this way: "He was so well versed in the law that he had no equal, and he was so wise and prophetic, sound of advice and well-intentioned, and whatever course he counseled turned out well."[126] For someone so insulted by the people surrounding him, Njal was surprisingly well-respected. This was indicative of his subversive status in both society and in the gendered makeup of Saga literature. He was, for all intents and purposes, a Type B protagonist with a single Type A trait (lawspeaking)—a protagonist in this saga despite the emasculation he suffered. While this position does not instantly make Njal queer in the modern sense, his acceptance of his role as a Type B man in this society is imperative to understand the reading. The fact that Njal maintained an adequate enough reputation in his social circle is evidence that Clover's scale could be subverted and bent by certain characters. Despite all his unmasculine characteristics, Njal was still considered worthy of respect in masculine spheres.

An integral part of queerness is the active subverting of the norms of the predominant culture—the act of being unapologetically oneself despite those norms. Njal, with his one Type A trait of lawspeaking, defied the expected social trend through his saga to contend with the norms of the time, thereby queerly expressed himself in a rather tight culture.

[122] Ibid., p. 69.
[123] Ibid., p. 73.
[124] This scene is reminiscent of Lokasenna in the Poetic Edda, which I highly recommend giving a read.
[125] Ibid., p. 210.
[126] Ibid., p. 35.

Unlike their male counterparts, there is unfortunately scant information about gender non-conforming women in the sagas sampled in this paper; however, there are a few examples. Bergþora, Njal's wife, was first mentioned in the same chapter in which Njal is introduced. While she was not a central character in the saga, she still held significant power for a woman in the genre of the Family Saga. She owned the property she and Njal lived on, as illustrated by her name being part of the name of the hall itself: "Bergþorshvol," and was even mentioned as a "*drengr goðr ok nokkut skaphorð*," translated as "a good *drengr*, but somewhat harsh-natured" by Clover.[127] This recalled the social fluidity allowed by the single-sex model in contemporary Icelandic society. Bergþora ascended the ranks of Clover's scale to achieve the rank of *drengr*, which entitled her to the (approximate) level of respect given to a Type A man despite her biological sex. As such, Njal and Bergþora diverted the expected power relationship of a married couple. Bergþora held the rights to the property, while Njal simply lived there.

Njal and Bergþora's relationship is a fascinating commentary on a complicated societal perception of a Type B man with an extremely competent, Type A wife. It may be that this sort of companionship was not as unusual as *Njal's Saga* attempted to portray, but the inclusion of this dynamic allowed for the queering of relationships within old Norse society—especially in Iceland, where the Family Sagas take place. Its inclusion in this saga brought up two possibilities: either this relationship dynamic was abnormal enough to appear in the story because of its uniqueness, or this was a semi-standard arrangement within contemporary society. Either possibility could have lent itself to the feasibility of these relationships, even if they were uncommon.

Another important *drengr* character is that of Breeches-Auð, who was described in the *Saga of the Peoples of Laxardal* as a woman who "often dressed in breeches, with a codpiece and long leggings."[128] Her husband, Thord, was advised to divorce her on the grounds that she was cross-dressing (as it possibly was an indication of homosexuality, as the Penguin Edition's notes suggested[129]). When she learned of the divorce, she spoke a piece of skaldic verse to illustrate her displeasure. In Icelandic Saga literature, only the most masculine of characters created and recited poetry. It was noteworthy that a woman, even a *drengr* like Auð, engaged in this craft.

Auð, despite her anatomy and assigned station, ascended the ranks of society to become a *drengr*, and she acted the part, too. Arguably, she was one of the most masculine women to appear in the Family Sagas; she was certainly the most masculine to appear in the small sample of tales collected for this paper. However, her inclusion was important, as the association she had with the main action of *the Saga of the Peoples of Laxardal* appeared to be one that required her presence. Her actions and presentation as a gender (and perhaps sexually) diverse character indicated that, even during her time, queer identities existed and sometimes resulted in powerful positions in society.

Auð appeared even more masculine when, after her divorce with Thord was ratified, she rode to his house after nightfall and stabbed him in retaliation. When she entered the house, she was described thusly: "She entered the bed closet, where he slept on his back facing upwards. She woke Thord, but he only turned over on his side when he saw some *man* had come in."[130] Thord's confusion over Auð's gender due to her presentation indicated, that in this moment, her societal status increased. What is more, the blasé way that Auð was described as a man may indicate that the identification of masculinity in Auð's presentation have been routine.

Moreover, in stabbing Thord, Auð

[127] Ibid., p. 7.
[128] The Saga of the People of Laxardal, London, Penguin Classics, 2008, p. 70.
[129] Ibid., p. 195.
[130] Ibid., p. 72. Italics my own.

perpetuated the cyclical violence usually reserved for men. Auð, in a sense, inhabited all the spaces of Type A men during her appearance in *Laxdaelasaga*. She maintained her identity as a high-powered character, both with her strength and with her attire and attitude, acts that would have likely placed her firmly under a queer umbrella today.

Auð was not the only well-respected woman in Icelandic Family Sagas, but she was one of the most prominent, especially for her use of men's clothing and masculine characteristics, with which she deliberately broke away from what was expected of women. Unfortunately, there was little evidence of Auð outside of this saga, and her appearance in it is brief.

The Icelandic Family Sagas were written down around 200 years after their events took place to preserve the oral tales of Iceland's history. In the time they were passed around orally, they were likely shaped by each person they came into contact with, before they were written down for posterity's sake. Much like *The Eddas*, the characters described in the Family Sagas were written with a monastic lens and therefore may have been altered to fit into a Christian worldview. These sagas were not purely historical, yet they allowed us to peer into the past, albeit through a slightly tinted window.

5. ARCHAEOLOGY

In 1938, the Sutton Hoo burial site, a Viking-age ship burial laden with weapons and gold (known colloquially as the Beowulf Horde), was discovered in England.[131] This single discovery led archaeologists to excavate a flood of semi-contemporaneous burials and cremated remains in the vicinity. Common pieces in the Sutton Hoo mounds included shield-bosses, knives, and spears. Mound 1 also contained a helmet and a mail coat.[132] Based on other material found in and surrounding Mound 1, it was inferred that the person buried there was a high-status individual, but no osteological data remained due to previous grave looting.[133] Despite this, today, Mound 1 is still considered the go-to Viking burial example of a high-class male individual due to the prevalence of gold, armor, and weapons, something that archaeologists now expect when looking for possible evidence of gender at a Viking-age site.

Because of the close relationship between buried individuals and the material culture they were entombed with, it follows that gender deviation would appear in archaeological graves, especially if the buried person was different from the "ideal" individual in society. The material culture associated with males in such Viking-age graves includes martial gear like swords, shields, and armor. Females are generally found buried near their household goods like jars, textiles, and keys.

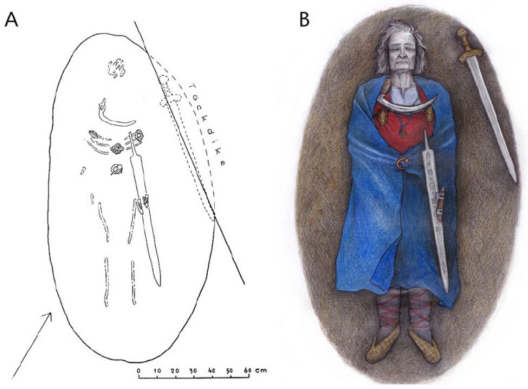

Figure 1: the intersex individual in Suontaka Vesitorninmäki, Finland.

However, artifacts found in graves may also bring to light how people in society differed. A possible example of gender deviation in archaeological records was recently uncovered just outside of Scandinavia: in Suontaka Vesitorninmäki, Finland (see Fig. 1 for a reconstruction). Of course, Finland is not part of Scandinavia, but it this burial contained very similar material culture and would have likely been involved with Scandinavian culture and norms at the time. The implications of this individual's burial are enlightening for our

[131] Martin Carver, Sutton Hoo: Burial Ground of Kings?, British Museum Press, 1998, pp. 173-4.

[132] Ibid., pp. 180-3.
[133] Ibid., p. 92.

furthered understanding of gender and its presentation through medieval history. [134]

The descendent was buried with feminine clothing and a single (likely ceremonial) sword blade. Most tellingly, the grave contained, among other artifacts, one bronze-hilted sword, one hiltless sword blade, and two turtle brooches.[135] Based on the presence of the turtle brooches, the individual was likely buried in feminine garb, which was indicative of either the gender attributed to the individual by society or the gender the individual was most closely connected to during their life. Without the inclusion of the two swords, this would appear to be an individual who, despite their chromosomes, would have been perceived by society to be a woman (or woman-adjacent).

Radiocarbon dating placed the burial between 1040 and 1174 CE, around the latter half of the events of the Icelandic Family Sagas, and chromosomal analysis on a bone fragment from this individual found that they had XXY chromosomes, an intersex condition known as Klinefelter's Syndrome. Klinefelter's is characterized by primary sexual characteristics of XY individuals alongside gynecomastia (enlargement of breast tissue) post-puberty, weak bones, a small penis and testicles, and a low sex drive.[136] The Suontaka individual would have been biologically male, yet they would have exhibited abnormal secondary sex characteristics. In this case, the individual was buried not according to their anatomical sex of male, but as a woman.

As attested to by Ulla Moilanen *et al.*, swords are not often found in female-associated graves; they indicated a warrior or ceremonial status often not attributed to women in archaeological contexts. This abnormal find makes the swords' prominent place in this grave integral to understanding the individual's place in society.[137] In medieval European archaeology, the existence of a sword intermixed with jewelry (which is attributed to contemporary women in this context) is often assumed to be a burial that contains (or contained) multiple individuals in one place, even if only one body was recovered there.[138] In this case, the hilted sword described was buried next to—but not entirely associated with—the remains, prompting the question of whether this sword was interred in the location at a later date. If, as the evidence suggests, the hilted sword was intentionally placed near this individual *after* the initial date of their internment, it could indicate they had a ritualistic or societal importance. Such an occurrence could lend credibility to the notion that the individual interred was of high status within their community or could have possibly been involved with magical practice in the area.[139]

However, as the hilted sword was likely not buried at the same time the individual was interred, it is of less importance to the focus of this paper than its hiltless counterpart. On this subject, Moilanen continues,

> The placement of the hiltless sword is… significant, as swords placed directly on the body may be interpreted as strong symbols of identity and personhood. The hiltless sword does not bear evidence of battle damage, and the handle has been removed as if to make it unusable, or less violent and genderless if the traditional perspective on the symbolism of swords is

[134] Ulla Moilanen et al. "A Woman with a Sword? – Weapon Grave at Suontaka Vesitorninmäki, Finland." European Journal of Archaeology, 2021. p. 47.
[135] Ibid., p. 45.
[136] Ibid., p. 45.; "Klinefelter syndrome," Mayo Clinic, Mayo Foundation for Medical Education and Research, Sept. 21, 2019, accessed 6 May 2022. https://www.mayoclinic.org/diseases-conditions/klinefelter-syndrome/symptoms-causes/syc-20353949.
[137] Ibid., p. 44.
[138] Ibid., p. 45.
[139] Ibid., p. 53. For more information on the possibility of magic being involved in this burial, please read Moilanen's article cited originally- they discuss very more on the possibility that the Suontaka individual could have been involved in local religious practices. For an even more enlighening situation, please read in tandem with Price's book cited above.

followed.[140]

Archaeologists and researchers have postulated upon what this placement may mean, some occasionally proposing a magical intent, and others that it may have been as a symbol of lost or unusable masculinity.[141] I am personally of the opinion that the hiltless sword, based on its positioning, engravings, and cost that it would have required, acted as a type of positive *nið*: a declaration that *despite* this individual's biological unconformity, they made the best of their situation and became the person they were meant to be. In early modern rural Finland, clothing was associated heavily with anatomical sex, and the fact that this person was buried in feminine clothing indicated that this particular individual was more closely associated with their gender presentation than they were with their anatomical sex.[142] The use of cultural material, like clothing and grave goods, to indicate the interred's gender or role in society provides evidence for (possibly accepted) gender deviation in an area in very close contact with Scandinavia during the Middle Ages.

The Suontaka individual was richly ornamented at the time of their burial, which may have attested to their high social standing. However, they were also presented in clothing that would have been socially contrary to their anatomical sex. If they did dress this way during their life, how did the discord between their anatomy and social presentation change their social standing? How did this impact their social perception, and by extension, their burial? These are questions that are yet to be answered, partially due to the limitations of archaeology, and partially because there has been an active erasure of queer lives and existence by historians.

In archaeology, researchers are unable to see the individuals as they lived—they can only be seen as they were buried or preserved. Due to the randomness of preservation and shifting funeral styles over thousands of years,[143] much has been lost to time. It is impossible to infer what someone was like during their lifetime solely based on the circumstances of their burial or preservation. Moreover, the dead cannot bury themselves; others must prepare them for their journeys into their afterlife, and that may mean that the remains are altered—both literally, through funeral activities like burning, and superficially, by changing the clothing and items associated with the deceased during or prior to funerary rites. Often, the individual's burial (or other funeral rites) indicated their social standing, who they were, and their occupation via grave goods, positioning, and attire, but they are only given to us by third parties in the distant past. We cannot learn everything about the person being studied only by their graves. I would argue that given the wealth of the goods retrieved from the grave, especially the hiltless sword blade and the turtle brooches, the Suontaka individual was likely a gender-diverse individual in an area with gender norms similar to that of medieval Scandinavia.

However, as pointed out in Moilanen's article, "[archaeological] graves may not tell us about the gender systems of the past per se, but rather about the assumptions of the modern people making the interpretations."[144] It would be amyss to map modern ideas of gender, society, and their mixings onto the societies of the past. Graves, however, can be used to analyze how nonconformist communities are perceived in the context of their own culture.[145] As Judith Butler argues, gender is a performance, and there is no one "right" way to perform it.[146] This goes for other societies, too: gender is not set in stone, and the language used

[140] Ibid., p. 50.
[141] Ibid., p. 50.
[142] Ibid., p. 52.
[143] For more information on the shifting of Scandinavian funerary practices during the Viking age, please read Hilda Roderick Ellis, "The Road to Hel," New York City, Greenwood Press, 1968.
[144] Ibid., p. 45.
[145] For more information on how the presence of beads in archaeological contexts influenced how researchers interpreted the contents of their finds please read Joanne O'Sullivan, "Strung Along: Re-evaluating Gendered Views of Viking-Age Beads," Medieval Archaeology, 2015.
[146] Ibid.

to describe it changes throughout time and space.

Another example of possible gender deviation is grave Bj 581 in Birka, Sweden. Contemporary Birka was a trading hub for the medieval Scandinavian world and had ties to the Ural Mountains, the Caliphate, and the Byzantine Empire.[147] Grave Bj 581 was a large, well-furnished chamber containing one skeleton dating between the 8th and 10th Centuries.[148] Based on their positioning, the individual was likely sitting in a chair upon inhumation.[149] Their burial chamber contained a sword, an axe, a spear, armor-piercing arrows, a battle knife, two shields, two horses (one mare and one stallion), and a full set of gaming pieces—all objects heavily associated with high-ranking and supposedly "masculine" activities.[150] When the skeleton was analyzed, however, osteological markers pointed to the individual being female, which conflicted with the going assumption that the interred individual was male based on their grave goods.[151] Genomic sequencing later confirmed that the individual interred, in fact, had XX chromosomes.[152]

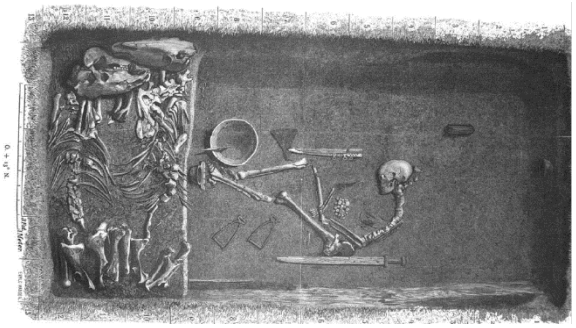

Figure 2: Grave of BJ-581.

Bj 581's skeleton did not exhibit any signs of peri or postmortem trauma that could have led to their death, which followed a trend of decreased osteological trauma in medieval Scandinavia as a whole.[153] While it is possible that the deceased participated in warfare or warrior-like activities without incurring osteological markings, the inclusion of weapons in Bj 581 may be a reference to social status rather than to military prowess.[154]

Soft tissue and fibers do not preserve well in the areas where both the Suokotana individual and Bj 581 were found, so the physical clothing both were wearing is not obvious. Based on the Suontaka grave's use of turtle brooches, it was plausible to infer that the individual was wearing an apron dress—a garment that was fastened at the shoulder/pectoral area using turtle brooches to hold the dress on the body—indicating a difference between their anatomy and their gender presentation. Bj 581's clothing is much more difficult to pin down, as no evidence of a belt buckle, brooch, or any other metal accouterment was found. Without such vital evidence, it is impossible to imagine what they were wearing when they were interred.

6. CONCLUSION

As more knowledge and awareness about gender diversity is spread in the modern era, it is important to acknowledge that gender diversity is as old as time itself. Of course, it is also important to understand that contemporaneity is key. Modern terms and concepts do not perfectly map onto the past, but the broad strokes are still there, ingrained in both literature and material culture. In medieval Scandinavia, gender deviation made itself most apparent in those who stepped outside of the "normal" expression patterns of women and men were apparent.

Myths are key to assessing gender, its diversity, and its place within the social and religious structures of any society. For medieval Scandinavia, the characterization of Loki and Odin are important in understanding how people with differing levels of social standing

[147] C. Hedenstierna-Jonson, et al., "A female Viking warrior confirmed by genomics." 2017. p. 1.
[148] Ibid., p. 6.
[149] Ibid., p. 2.
[150] Ibid., p. 2.
[151] Ibid., p. 3.
[152] Ibid., p. 3.
[153] Ibid., p. 6.
[154] Ibid., pp. 5-6.

and gender presentations were perceived. Loki, for example, was demonized and viewed negatively because of his deviant actions—both in terms of his gender and his allegiance to Odin—perhaps due to the Christian interpretation of binary good and evil. Odin, despite his usual position of power at the head of the pantheon, was somehow immune to the societal ramifications of transgressing gendered lines.

Similarly, the Icelandic Family Sagas presented a host of gender-diverse characters and actions, ranging from the unmasculine behaviors of Thord, the aged Egil, Guðmund the Powerful, and Njal to the decidedly masculine exploits of Bergþora and Breeches-Auð. All six of these people, either through societal norms or through their own convictions, became something other than what was expected of them in regard to their expressions of themselves. Seeing these characters as both disdained and glorified within the Family Sagas has proven itself to be a compelling look into the social norms and convictions of contemporaneous peoples.

It is more difficult to pin down gender deviance in archaeology; however, it is clear that, due to the contemporary archaeological examples of both the Suontaka intersex individual and the individual in Bj 581, gender and its expression were both flexible, and (possibly) highly respected. As discussed above, archaeology can be limited due to the randomness of preservation and the lack of autonomy in the accessorizing and dressing of the deceased during burial/funeral rites, but even still, material evidence continues to validate the existence of gender diversity in populations across time and space.

Gender diversity is a topic that has been both divisive and intensely important in many people's lives, my own included. The fact that some scholars have refused to consider gender diversity in medieval documents and material culture should be controversial; it pushes the lives and actions of gender-diverse people into the background of medieval reality when in fact they may have been shining in the forefront. In not allowing their stories to be heard, understood, and examined today, traditional scholars are not only disenfranchising potential new scholars from research and academia not only by excluding stories like theirs from modern knowledge of history but are actively pushing the false notion that gender deviation and its expressions are modern phenomena. It is critical that stories of gender deviance in medieval literature are understood and studied by a wider audience. Such knowledge and widespread understanding of historical gender diversity may be a way to widespread acceptance of modern gender diversity by countering fallacies that trans people are an invention by modern youth. This paper is a call for more research in such a field of study: queer theory and queer studies must be brought to the desks of medievalists. Without such a push, academia will continue to be alienating towards the people who will carry on the study of medieval cultures. The more unique perspectives that can be brought into a field, the better it performs, and medievalism must follow that trend.

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"My body is its image, here": Diasporic Identity and the Deconstruction of Binary Division in 21st Century Asian American Poetry

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ABSTRACT

This paper examines the poems of Franny Choi and Victoria Chang within the context of Asian American poetry, poetics, and criticism. It demonstrates how Choi and Chang's work engage in a destabilization of binaries in order to rewrite and re-construct Asian American identity. A close reading of Choi's "Chatroulette" from her collection, Soft Science, and Chang's "Home" from her collection, Obit, reveals disruptions of five binary divisions, broadly identified as "high" poetic form and "low" poetic form, Eastern and Western, English and non-English, embodiment and disembodiment, and past and present. This paper argues that the deconstructions of these five binaries represent a search for belonging in the context of Asian American identity, as it is an identity that itself transverses the boundaries of "Asian" and "American." This is supported by scholars of Asian American literature such as Michael Leong, Brigitte Wallinger-Schorn, and Zhou Xiaojing, who investigate how Asian American poets navigate alterity and cultural hybridity through innovation. It concludes by examining questions of home and belonging, theorizing that, for Asian American poets, reinventing language in a way that transgresses binaries and dichotomies allows for the construction of a new "home" that accepts the indeterminacies of identity, life, and death rather than resisting them.

1. INTRODUCTION

The term "Asian American" inherently defies binary, as Asian Americans inhabit a space which cannot be accurately described as merely "Asian" nor "American." Thus, any attempt to force Asian American individuals into a crude dichotomy will fail, as the identity itself cannot be understood as a single thing, but rather, it represents a nebulous, multifarious space of indeterminacy. Asian American poets, who are denied a "home" in a discrete, self-contained unity or community, have adopted the task of constructing a new, linguistic "home," which allows them to inhabit spaces in between binary divisions. Franny Choi's collection, Soft Science, and Victoria Chang's collection, Obit, both grapple with the struggle of escaping the oppression of the binary. In particular, the poems from these collections—"Chatroulette," "Home," and "I can't say with faith"—oppose binary oppositions in both content and form. I identify five main binaries or tensions which these poems navigate, including prestige ("high" form v. "low" form), geography ("East" v. "West"), language ("English" v. "non-English"), the body (inhabited v. uninhabited), and the archive (past v. present). I argue that Choi and Chang's poems fully destabilize all of these binaries, thereby inventing a new, distinctly Asian American "home" embedded in language, writing, and poetry.

Asian American poetry not only disrupts these five binaries but constructs a space of safety, home, and beauty within the grey space between distinctions supposed to be black and white. Choi and Chang challenge the line between "high" poetic forms (prestigious forms with institutional power) and "low" poetic forms (common forms with less power) through playing with formal conventions and

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juxtaposing disparate forms. In doing so, they invent new formal atmospheres which exist comfortably as neither wholly "high" nor "low." Similarly, Chang draws upon both "Western" (Anglo-European) and "Eastern" (East Asian) poetics and philosophies in order to construct a uniquely Asian American style, which indicates the impossibility of understanding "Eastern" and "Western" culture as discrete, unrelated units. At the same time, both poets grapple with writing in America's dominant language while having parents of marginalized linguistic backgrounds. Chang's use of Mandarin and Choi's examination of English-language "impersonation" break down the barrier between English and other languages. The poets also question the nature of the body, contending that the "self" (or identity) is also a part of the body. For Choi and Chang, the consequence of "racial dissociation" (the construction of a false self in order to protect oneself from racism) is a feeling of bodily dis-inhabitation, thus opposing the idea of the body as either fully dissociated or fully inhabited. Finally, the poetry blurs the distinction between the past, present, and future, as both Choi and Chang build a poetic archive constituted by both memories of the past and hopes for the future. The disruption of all of these binaries symbolizes the nature of Asian American identity—for Asian Americans to find a "home," they must exist in between the divisive categories of "Asian" and "American."

2. PRESTIGE: RETHINKING "HIGH FORM" AND "LOW FORM"

Both Soft Science and Obit utilize a variety of forms—such as tanka, sonnets, and obituaries—all of which disrupt the binary division between "high" and "low" forms of poetry. "High" forms of poetry usually have institutional power (in education, politics, and literary studies), are popular in elite circles, and have a long tradition of being revered as an important art form. On the other hand, "low" forms of poetry represent traits opposite these: namely, a lack of institutional or popular recognition as a deep and complex form of art. For Choi's Soft Science, the destabilization of "high" and "low" poetry occurs largely in the parallel tensions within form and content. For example, her poem "Chatroulette" is a crown of sonnets, and while it adheres rather strictly to an iambic pentameter, it is almost entirely unrhymed. The use of sonnets here directly calls upon a form which "has been held up as poetry's epitome…and a cultural talisman" due to both "English imperial power" and its ability to adapt to contemporary readers (Cousins and Howarth 1). While the sonnet form therefore enjoys a status as an archetypal "high" poetic form, Choi plays with the strict, formal rules of traditional sonnets in order to reinvent it in a form beyond the limiting binary of "high" and "low." This is evident from the first stanza:

> To see, to come, I brought myself online.
> O dirty church. O two-way periscope,
> Refractory for Earth's most skin-starved cocks.
> O hungry sons of helicopter palms
> In hopeful carousel. ("Chatroulette" 1–5)

The first line—even the first set of words—establishes the metric atmosphere in a distinct, almost-exaggerated manner due to the commas which separate the feet: "To see, to come, I brought myself online." Yet the rhyming departs from this formal compliance completely, as most of the lines do not rhyme at all. Furthermore, the end rhymes that do appear are erratic and sparse; for example, the third sonnet roughly follows an ABCC DEFG HIHJ KK pattern, made entirely of half-rhymes (29 –42). While many different styles of sonnet exist, they all generally use a strict rhyme scheme, such as ABAB CDCD EFEF GG, and they seldom use half-rhymes. Thus, in "Chatroulette," the sonnet form itself becomes a site of indeterminacy, as the poem balances a strict meter typical of traditional sonnets and an amorphous rhyme scheme which departs from these formal conventions. The formal ambiguity parallels the content of the poem, in which a lexicon of disgust ("dirty," "foul," "filthy," "disgusting," "rot") contrasts a simultaneous lexicon of religion ("church," "congregations," "god,"

"marry," "christen") ("Chatroulette" 2, 10 –11, 14, 22, 32, 45). Just as the sonnet form becomes deconstructed within the poem through both resisting and adhering to formal conventions, the lexical tension fuses the high, elevated theme of religion with a manifold exploration of decay, hunger, and filth. The poem is neither "high" nor "low:" it seamlessly blends a prestigious, elite form with subversion, rule-breaking, and ambiguity. Thus, "Chatroulette" opposes the distinction between "high" and "low" poetry through its ambivalence toward its own form, which expresses a simultaneous disgust and reverence toward a space of complex, intertwining filth and beauty—or, as Choi puts it, a "dirty church" (2).

Chang's collection, Obit, invokes a similar deconstruction of "high" and "low" poetry, though instead of destabilizing form through playing with meter, rhyme, and lexicons, it uses multiple disparate forms throughout the collection to challenge notions of prestige. The majority of the poems in Obit follow an obituary form, which is typically not considered poetry at all. Compared to the "high" form of the elegy, obituaries are written in prose with tight margins reminiscent of newspaper formatting rather than poetic verse. In terms of content and prestige, the obituary is a form often associated with the everydayness of the newspaper and detached, pragmatic reportage. However, obituaries actually serve a variety of literary purposes. They "can be an engaging newspaper accompaniment" and compared to a "news story's concentration on death," the obituary creates an "emphasis on life" through detailing the deceased person's characteristics, achievements, and peculiarities (Starck 6 –7). The obituary, especially when used in the context of poetry, breaks down distinctions between "high" and "low" art, not only through its constant tension between "[o]rnate expression" and biographical information, but through concurrently exploring life and death, spectacle and austerity, and the newspaper as both an icon of banal everydayness and titillating newsworthiness (32).

Despite the collection's focus on exploring the obituary, tanka poems are interspersed erratically through the volume. Unlike obituaries, tanka poems have "a long history in Japan" as a prestigious poetic form known for "emotion" and "wordplay" and hold a defining position in the Japanese literary canon (Ishikawa 32 –35). However, in a similar fashion to obituaries, tanka poems are "familiar to men and women of all ages" as "[a]ll the major newspapers in Japan print reader-submitted poetry in tanka columns," while still maintaining an elevated status as a "high" form (Ishikawa 32 –33). While the tanka form may initially appear as a more prestigious form when compared to obituaries, tanka poems are also widely-disseminated, popular, and easy to understand. On the other hand, obituaries have been recognized as deeply valuable "instrument[s] of historical record" and an art form capable of "conveying personal bereavement," despite their commonness (Starck 16, 46). The seemingly-random interweaving of tanka and obituary forms reveals both the banality and the artistic capabilities of both forms. The combination of these two forms in Obit fully destabilizes "high" and "low" forms through creating a formal atmosphere in which every act of linguistic creation, ranging from elevated, traditional poetry to newspaper columns, is an aesthetic, artistic, and deeply personal act of exploring oneself.

3. GEOGRAPHY: COLLAPSING THE EAST-WEST DIVIDE

In the context of diasporic identity and form, Chang draws from both Asian and European aesthetics and poetics in order to shape a new, distinctly-Asian-American style. The most obvious example of this is Chang's weaving of Japanese tanka poems throughout Obit, which reveals the collection's deeply "hybrid" nature—in a sense, the eclectic and diverse poetic forms of Obit symbolize the dual identity of "Asian American." This exemplifies Wallinger-Schorn's concept of "formal hybridity," which indicates

how Asian American poetic forms "destabilize genre definitions and dogmas and contribute to the ever shifting possibilities of cultural hybridity" (182). Obit hybridizes two disparate forms (obituary and tanka, associated with the "West" and the "East," respectively) to explore the universal human phenomenon of grief and thereby challenges the distinction between "Eastern" and "Western" forms. Wallinger-Schorn also observes "a formal revival in contemporary American poetry" despite a conventional understanding of 21st-century poetry's focus on "a postmodern deconstruction of formal stability" (180). Even though 21st-century poetry is perhaps best known for free verse and the dissolution of formal restrictions (such as meter, rhyme, and structure), contemporary Asian American poets often utilize various traditional forms from both within and beyond the English-language tradition (such as Choi's sonnets and Chang's tankas). This simultaneous return to form and deconstruction of form relates to identity, as poets explore the omnipresent tension between taking pride in one's cultural and racial identity while also destabilizing the very basis of race itself. In "Home," the mother's imagined speech pulls at this tension:

> .....When
> a white writer has a character call
> another a squinty-eyed cunt, I search
> for my mother. I call her name but I
> can't remember her voice. I think it is
> squinty. She would have said, Don't
> listen to lao mei, we all end up in the
> same place. But where is that place?
> ("Home" 11 –18)

Here, "lao mei" sows difference between Chinese Americans and non-Chinese Americans, while "we all end up in the / same place" expresses a humanistic universality that transcends such differences (16 –18). For Asian American poets, "formal hybridity" has become a necessary mode of expressing both the beauty of a culturally-mixed identity and the impossibility of being fully "Asian" or fully "American."

In addition to hybridizing form, Chang uses an Asian philosophical and artistic tradition to inform her work. One of the most frequently-cited Eastern ideas, which can vaguely be described as "emptiness" or the void, is "difficult…to understand vis-à-vis binary…constructs like being/nonbeing" (Stalling 9). An Asian ontological reframing of "nothingness" as a central part of both art and human existence especially appears in Chang's tanka, "To love anyone:"

> To love anyone
> means to admit extinction.
> I tell myself this
> so I never fall in love,
> so that the fire lights just me. ("To love anyone" 1 –5).

The acknowledgement that "to love anyone / means to admit extinction" particularly stands out, as the word "extinction" implies not only death, but nonexistence, or the utter erasure of something from the face of the planet (6 –7). The following lines—"I tell myself this / so I never fall in love"—seem to indicate a rejection of "nothingness" along the lines of Stalling's identification of "the fear of 'nothing' in the Western psyche" ("I can't say with faith" 8 –9, Stalling 11). However, the penultimate poem of the collection, also a tanka, transcends this fear:

> I am ready to
> admit I love my children.
> To admit this is
> to admit that they will die.
> Die: nobody knows this but words. ("I am ready to" 1–5).

As the speaker proclaims, "I am ready to / admit I love my children," they come to accept that the nothingness of death allows them to finally "love" others rather than live in fear. This radical shift appears in large part due to "cultural hybridity," or the balancing of Asian and American cultural thought in order to construct a new identity—one that is capable of loving fearlessly. In Chang's tankas, freedom from the specter of death and grief that permeates

through the Asian American community can only be found through destabilizing the boundaries between Asia, Europe, and America and the building of a new formal and poetic language.

4. LANGUAGE: ENGLISH-LANGUAGE HEGEMONY AND AMERICAN IDENTITY

Moving beyond form and content, Asian American poets also find themselves embroiled in reinventing language itself as they navigate the complexities of deconstructing English-language hegemony. As all of Choi and Chang's poems are written primarily in English; these texts reflect the dominance of the English language over Asian languages in both American vernacular language and American literature. Yet, Asian American poets find ways of resisting this dominance while writing in a colonial, hegemonic language. According to Zhou, "there is…no 'home' to dwell in in English. Rather than seeking refuge in English, Asian American poets reinvent new ways of saying and hearing in that language," and this question of a linguistic "home" appears in Chang's poem of the same name, "Home" (2). For instance, the use of the Mandarin word "lao mei" in the mother's imagined dialogue redefines "home" through redefining English (17). The word blurs the distinction between native and foreigner, as it is a Mandarin word written in English Romanization and situates the speaker outside of the category of "American." Thus, "lao mei" becomes, in a sense, a word written not in English nor in Mandarin but in a new language, one in which the very line between languages is ambiguated. This constructs the diasporic "home:" a space that resists both the call for assimilation into English and a return to the distant homeland of Mandarin, creating a distinctly Asian American language that is capable of expressing the complexities of a hybrid existence. Per Zhou's observation that "Asian American poets reinvent new ways of saying," Chang's poetry interests itself not only in resisting English-language hegemony but in building a linguistic home that imagines a space in which diasporic people are not constrained to a particular ethno-national-linguistic identity but exist comfortably in between these binary divisions.

Choi's work also engages in reinventing language, albeit in a strikingly different fashion. Though "Chatroulette" does not integrate non-English words, it engages in what Leong calls the "surreal mode"—particularly, the "surrealist act of face transplantation" (33). Leong notes how "it is assumed that Asian American poets—by default—write with white faces," yet they often subvert such presumptions through "a making of performative faces" (33). The "face" as a false performance appears in Choi's "Chatroulette:"

> [I am a] live action hologram projected on
> their basement brains. My foul amygdala
> Prince Thirstings, desperate congregations, pink
> or blue-brown mammals begging for my face. ("Chatroulette" 9 –12)

The description of "blue-brown mammals begging for my face" parallels Leong's surreal "face transplantation," as the poem relates how, in this online chatroom, the "face" (as a representation of identity) is always shifting, always desired, yet never more than a "live action hologram." The performativity of faces also appears in a later moment:

> I'll make you liquid men. I'll watch you eat
> my image, icon, rumor of a god
> who wants you back. Who wants to watch you dance
> your crooked dance, your sad attempts at flight. ("Chatroulette" 23-26)

Here, the use of the word "who" (rather than "what") implies a personalization of the speaker's "icon," suggesting that they have constructed an alternate self (or a "performative face") to cater to the "mammals begging for my

face." For Asian American poets, abstracting the self through surrealism and "impersonation" mirrors the blurring of the boundaries of English as a self-contained entity (Leong 34). Much as Chang performs multiple "faces" through linguistic surrealism, Choi finds the surreal within the literal face itself, examining the ways in which the anonymous chatroom user can become someone who they are not. In doing so, Choi blurs the lines not only between different languages and cultures, but between language and the "face," with the face representing both the body and the self.

5. THE BODY: INHABITATION AND DIS-INHABITATION

The body is among the most prevalent spaces of indeterminacy in Choi and Chang's work, as they explore with particular interest the simultaneous inhabitation and dis-inhabitation of the Asian American body. The body here represents not only one's physical flesh but also the self (or the body's idea of itself). For example, in Choi's essay on language and poetics, "Imitation Games," she utilizes the concept of "racial dissociation." This term is defined as the construction of "a 'false self' that is compliant, competent, and acceptable" in order to adhere to "a social contract of Asian American model minority citizenship" ("Imitation Games"). Choi recalls being mistaken for a part of a museum exhibit as an example of forced disembodiment of the Asian American body, essentially redefining her body as an object through refracting it as an art piece:

> I'm in an art museum in Dallas, sitting alone on a bench to listen to a sound installation… Suddenly, the door swings open, interrupting my focus, and a couple walks in. Like most of the museum's guests, they're white, middle-aged.
>
> "Oh my god!" exclaims the man, pointing at me. "I thought she was real!"
>
> Angry at the disruption, I turn my head to scowl at him.
>
> "Oh!" he says. "She is real!" He laughs and turns to the woman. "I thought she was part of the exhibit," he says to her. ("Imitation Games")

In "Chatroulette," however, dissociation through the construction of a disembodied image occurs through the screen, as in the lines, "My body is its image, here. My image, / just an always dying thing" (30 –31). The phrase "is its image" demonstrates grammatically the destruction of subjective embodiment, since "My body" is redefined quite clearly as only "its image." The subsequent "here" also implies embodiment (as "here" is where the body is, and "there" is where the body is not), suggesting that the speaker has entered a paradoxical space in which they are separate from the body through its stratification as an "image" of itself but also inhabiting it as a subjective "here." This is precisely what "racial dissociation" refers to—the "false" and "compliant" persona is also embodied, tied inherently to racialized, objectified flesh.

In Chang's "Home," the racialized aspect of this dissociation is even clearer, as the speaker recalls a moment "When / a white writer has a character call / another a squinty-eyed cunt" (11 –13). The white writer's attempt to capture racial violence again merely transforms the Asian body into an "image," brought to life through invoking the corporeal ("squinty-eyed"). The speaker's subsequent recollection of their mother's voice ("I think it is / squinty") demonstrates how the white writer's "image" of the Asian body has penetrated the speaker's memory of their own mother (15 –16). Here, the "racial dissociation" occurs directly at the site of the white writer's appropriation of racialized violence, even though the "false self" is the self which is racialized in a bodily manner (as in the phrase "squinty-eyed"). For the speaker, liberation occurs in destabilizing the body through re-inhabiting the mother's body. This occurs in a final epiphany that concludes the poem:

> .....I lie down
>
> next to her stone, close my eyes. I know many things now. Even with my eyes closed, I know a bird passes over me. In hangman, the body forms while it is being hung. As in, we grow as we are dying. ("Home" 23 –29)

In the line "I lie down next / to her stone, close my eyes," the speaker lies above the mother's grave with her eyes closed, paralleling the position of a body in a casket (23 –24). The tension here lies in the simultaneous closeness between the bodies created by the speaker's imitation of the mother's bodily position beneath the earth and the distance that they have between the realms of above ground and below ground, death and life, parent and child. The ability for the daughter to symbolically re-inhabit the mother's body while maintaining distance represents her newfound ability to embody her past and her heritage while still existing as her own, unique, living self. It is this realization that allows for the sudden epiphany: "I know / many things now" (24 –25). In a dramatic rejection of the image created by the white writer, the speaker returns to the physicality of the body (even, in this case, the buried body) in order to rewrite the Asian American body not merely as a site of dissociation, but as a shared body between the self and the mother.

6. THE ARCHIVE: HISTORY AS EMBODIED PRESENT

Exploring the body also delves into questions concerning embodied histories through the construction of an "archive." Chang's use of the obituary form in particular, which represents a "valid instrument of historical record" capable of gaining "insight…of what it was like to be a citizen of a particular community at a particular time," becomes a way both of making history through documentation and reliving history through writing (Starck 46). This becomes apparent towards the beginning of Chang's "Home:"

> Now home is a looking glass called Rose Hills Memorial Park. How far she has travelled from Beijing to Taiwan to New York to Pennsylvania to Michigan to California to Rose Hills. ("Home" 8 –11)

This passage directly relates to the quality of a "brief biographical sketch" that many obituaries possess rather than constituting a mere death notice (Starck 10). To this end, the obituary is both a way of reifying the past (for example, the mother's migration) as the present while also historicizing and preserving the present (the death of the person) as the (soon-to-be) past.

This confounding of past and present through the archive mirrors a trend in Asian American poetry that Leong calls "the documental mode," which roughly describes "poems that incorporate prior records" such as "found text" or "images" (36 –7). One of the poems in Choi's Soft Science, "The Cyborg Wants to Make Sure She Heard You Right," demonstrates this idea precisely. The poem is preceded by a brief preface: "Composed of tweets directed at the author, processed through Google Translate into multiple languages, then back into English." Choi's use of the documental mode builds an archive in which the hatred of the past cannot be obscured even through altering the found text technologically and linguistically. The intention of the tweet composing the very first line—"Mrs. Great Anime Pornography, the fruit of the fields"—is relatively clear despite the methodical augmentation that the author used on the text ("The Cyborg Wants to Make Sure She Heard You Right" 1). While Choi uses found text in a literal sense, Chang's "Home" plays off of this idea in a new, inventive way, using an archival form but writing her own content. For Chang, the "found text" is not a physical artifact but a psychic one, as revealed in this moment: "I / can't remember her voice…She would have said" (14 –16). Since the obituary form of the poem marks it as a documental space, the content becomes imbued

with historic significance, even though the phrase "She would have said" implies that the information is imagined rather than concrete. Thus, Obit rewrites the archive as a collection of possibilities, imaginaries, and internal desires rather than a representation of the past. In "Home," history as past, present, or future is destabilized, but even beyond that, the poem pulls at the tension between history as objective documentation and history as internal, psychological, and lived reality.

7. CONCLUSION

Contemporary Asian American poetry's interest in the dissolution of binary divisions seems at first to fit neatly into a general shift towards postmodern deconstruction. Yet this phenomenon carries particular weight in Asian American poetry specifically since it is inextricably tied to diasporic identity. Deconstruction exists not only as an abstract philosophical concept but as a directly-inhabited experience of defying categorization. Diaspora is by definition a transgression; it is a cosmic shattering of the elusive promise of neatly dividing humanity into discrete, easily-identifiable groups. For Asian American poets, deconstruction functions as a necessary building block for survival. Perhaps this is why so many of the binaries identified in this paper in some way relate back to the idea of "home" as Asian Americans construct a new home in poetry and language, a home that allows for all the beauty of complexity and contradiction to flourish. Asian American poets actively resist the forced dis-inhabitation of bodies, histories, and languages that racism produces through rewriting and redefining these terms—thus, in a sense, re-making language itself.

Despite the vast thematic and formal differences among "Home," "Chatroulette," and Chang's tanka poems, all of these works grapple with the necessity of dissolving binaries. Their poetry asserts that the methodology of achieving this ultimately lies in acceptance. In a final epiphany in "Home," the line "we grow as we are / dying" appears, paralleling Choi's exploration of "My image, / an always dying thing" and even the lines of the final tanka of Obit: "To admit this is / to admit that they will die" ("Home" 28 –9, "Chatroulette" 30 –1, "I am ready to" 3 –4). For both Choi and Chang, life comes into focus only when one accepts that death and life are not irreconcilable opposites but mutually constitutive, amorphous entities—to live is to die, and to die is to live. Just the same, Asian Americans are neither Asian nor American, yet both Asian and American. In Obit and Soft Science, the acceptance of this contradiction lays the foundation for a new Asian American language by rewriting the eternal tensions of indeterminacy and ambiguity as "home."

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Community composition of mussel associates at deep-sea methane seeps in the Gulf of Mexico and the US Atlantic Margin

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ABSTRACT

Efforts to understand and preserve the methane seep communities of the Gulf of Mexico and the US western Atlantic margin begin with an understanding of biodiversity and community composition. In this study, 10,143 individuals representing 63 different taxa were sampled from mussel-beds surrounding methane seeps at various depths within two different ocean basins. Diversity in mussel beds was highest at Baltimore Canyon, the shallowest site sampled in the Atlantic. Although only four species were sampled at more than one site, species composition was most alike among sites found at similar depths; the two deepest sites sampled, Florida Escarpment and Blake Ridge, showed a 9.6% similarity. However, depth is not the only predictor of similarity: Baltimore Canyon and Chincoteague are both located in the Atlantic Ocean at different depths but had a 5.3% similarity in species composition. The high diversity of individuals sampled among these sites emphasizes the importance of preserving seep communities, which provide essential nursery habitats and primary production that establish a food source for many migratory species within the deep-sea ecosystem. Not only is the diversity of seep communities unique and important to the deep sea, but seeps may be beneficial to the overall health of our Earth's ecosystem through the support of commercial fisheries and the sequestering of methane.

1. INTRODUCTION

Cold seeps are defined by the upward convection of methane and other hydrocarbons from the subsurface seabed to the seafloor and are typically found on continental margins worldwide (Ruff et al., 2015). The exploration of cold-seep communities first began in 1984 at depths ranging from 500 to 1000 m (Kennicutt et al., 1985). With the growing expansion of deep-sea exploration by commercial interests such as oil drilling, sea-floor mining, and deep-water fisheries (Levin et al., 2016), it is imperative to understand the community compositions surrounding these seeps to determine how they might be affected by anthropogenic factors. Much of the deep sea is food-limited, and methane seeps offer essential niches that provide habitat structure and primary production, supporting multi-trophic communities (Turner et al., 2020). In a largely barren ecosystem, methane seeps are biodiversity hotspots that provide an abundance of life. The invertebrates that settle among the foundation species of methane seeps contribute to food sources for migratory species and sequester a significant amount of the methane that sinks to the seafloor (Ruff et al, 2015).

Oxygen availability is often limited to the

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immediate surrounding area, resulting in a thin suboxic layer below the emitted hydrocarbon. It is here that partial pressure causes the methane to diffuse out of gas bubbles and into the water column, where microbial methane-oxidizing archaea (ANME) and sulfate-reducing bacteria (SRB) symbionts can use this resource to create a habitable environment. The primary production of communities of marine invertebrates within the deep sea is dependent on a process known as chemosynthesis—the conversion of inorganic energy sources to fuel. Chemosynthetic bacteria and archaea occur worldwide at cold seeps but are locally selected by the environment (Ruff et al., 2015).

Cold seeps are often characterized by one or more foundation species, often symbiont-bearing megafauna such as tubeworms or mussels (Turner et al., 2020). For instance, bathymodiolin mussels act as habitat engineers by modifying the physical and chemical environment, forming biogenic habitats that support a variety of additional species (Govenar 2010). Methane seeps are initially dominated by resident species, which use the foundation species for attachment, shelter, and access to food through grazing or currents (Cordes et al., 2010; Levin et al., 2016). The compositions of invertebrates living on the foundation species help characterize methane seeps' food chains and interspecies interactions. The ecological patterns surrounding seeps are typically influenced by bathymetric changes regarding interspecific interactions such as predation and competition (Cordes et al., 2010). Methane seeps with mussel beds as the foundation species are typically dominated by resident grazing gastropods, smaller decapod crustaceans, and worms of various phyla (MacAvoy et al., 2002). Many seep communities have been found to support both resident and vagrant species. The resident species are integrated into the phytoplankton detritus-based food web of the surrounding ecosystem. Conversely, vagrant species are characterized by a high degree of movement into and out of seep communities. This movement is essential for the export of seep production into the vast ecosystem of the deep sea (MacAvoy et al., 2002).

This study aims to determine the differences in invertebrate species compositions between methane seeps in the Gulf of Mexico and the US western Atlantic margin and also among seeps at different depths. Variations in species compositions at seep communities may be attributed to abiotic variables such as depth, food availability, latitude, and substrate type (Rex et al., 2000). Biogenic habitats are also sensitive to changes in fluid flux and chemical composition, which determine the distribution of symbiont-bearing megafauna and community composition (MacDonald et al., 1989). As depth and distance from shore increase, fewer nutrients are transported by currents to seep communities (Turner et al., 2020). In the Atlantic Ocean, variation in seep community patterns has been attributed to the faunal boundary between the upper-bathyal (200-1500 m) and lower bathyal/abyssal (>1500 m) seeps (Bernardino et al., 2012). A similar transition zone is thought to exist at 1000 m in the Gulf of Mexico (Cordes et al., 2010). Therefore, it is hypothesized that sites located at similar depths will display greater similarity and species overlap due to the previously-described bathymetric boundaries.

2. METHODS

2.1. SAMPLE COLLECTION

Mussel-bed communities were sampled from a total of six methane seeps: three sites along the western Atlantic margin (WAM) and three sites in the Gulf of Mexico (GOM) (Fig. 1). Scoops of mussels and their associates were collected from the seafloor in February and March of 2019 using HOV Alvin deployed from RV *Atlantis.* Sampling was also done in May and June of 2021 using ROV Jason deployed from RV *Thomas G. Thompson*. Both vehicles recovered the samples inside closed bioboxes, and the invertebrates within were then sorted from the foundation species (*Gigantidas childressi* and *Bathymodiolus heckerae*). Next, species were identified and

sorted based on morphology on board the ship. Samples were preserved in 10% buffered formalin and later transferred to 70% ethanol for storage. Preserved samples were further sorted by differences in morphology and identified to the lowest possible taxonomic level before being photographed in the laboratory. Samples were identified using the original published description of species. 70% ethanol deteriorates samples over time by bleaching them; therefore, some samples such as juvenile forms or fragments of an organism were more susceptible to degradation compared to fully developed adult samples. Those of these that were too degraded to photograph were still included in the statistical analysis.

2.2. DATA ANALYSIS

Samples collected in 2019 were organized into binary categories—presence or absence at each site—as there was no overlap in species. Diversity indices and the Bray-Curtis similarity index were not run on these data. This resulted in one site, Bush Hill, being excluded from the statistical analysis; it had been sampled only in 2019 and was not revisited in 2021. However, Bush Hill was still included in the taxa-comparison portion of this study. Samples from 2021 were organized into counts of species present, as there was some overlap of species found at each site. Diversity among these sites was estimated using a combination of diversity indices, including Shannon-Weiner diversity (H'), Pielou's index of evenness (J'), Margalef's richness (D), and individual-based rarefaction curves calculated using Primer v6 (Clarke and Gorley 2006). A Bray-Curtis similarity index assessed similarity among sites following a fourth-root transformation of species densities. The data were transformed to balance species with high individual counts. The Bray-Curtis similarity matrix was then visualized using a non-metric multi-dimensional scaling plot.

3. RESULTS

A total of 10,143 individuals representing 63 different taxa across six phyla were sampled from the mussel beds surrounding the studied methane seeps (Fig. 2). The six phyla present were Cnidaria, Nemertea, Annelida, Arthropoda, Mollusca, and Echinodermata. The majority of the samples represented morphologically-distinct species; however, the taxonomy remains largely unresolved. Of the six different phyla represented in this study, not all groups were present at each site (Table 1). The three Atlantic sites: Blake Ridge (2167 m), Baltimore Canyon (388 m), and Chincoteague (1028 m) were the only sites that contained samples from the annelid subclass Oligochaete. Brine Pool (651 m), sampled in the Gulf of Mexico, was the only site that provided samples from the molluscan class Polyplacophora. Baltimore Canyon (388 m), sampled in the Atlantic Ocean, was the only site that contained representatives from all six phyla present in this study. Bush Hill (562 m), the shallowest study site in the Gulf of Mexico, only contained species from two phyla: Annelida and Arthropoda. Brine Pool (651 m), sampled in the Gulf of Mexico, had Cnidaria, Annelida, Mollusca, and Echinodermata representatives. Chincoteague (1028 m), an Atlantic site, contained species from the phyla Annelida, Mollusca, Arthropoda, and Echinodermata. Blake Ridge (2167 m), the deepest site sampled in the Atlantic, contained five out of the six phyla, missing only Nemertea. Florida Escarpment (3287 m), sampled in the Atlantic Ocean, contained species from the same phyla as Brine Pool: Cnidaria, Annelida, Mollusca, and Echinodermata.

Despite the large number of individuals represented in this study, very few species were found across multiple sampling sites. A small brittle star, *Ophioctenella acies,* was found at both Blake Ridge and Florida Escarpment. These sites were located in different ocean basins but were the deepest sites sampled (Table 2). The Brine Pool and Bush Hill sites were located in close proximity to one another and at similar depths within the Gulf of Mexico, but only one species was found at both sites: the galatheid crab, *Munidopsis sp.1* (Table 3). Bush Hill and

Chincoteague were also located in different ocean basins, and Chincoteague was almost twice as deep, but the shrimp *Alvinocaris stactophila* was present at both sites (Table 3). The unidentified morphotype of "juvenile ophiuroid" was the only species present at more than two sites: Florida Escarpment, Blake Ridge, Baltimore Canyon, and Chincoteague (Table 2). These four sites represent both oceanic basins sampled in this study as well as the shallowest and deepest sites sampled.

Although Baltimore Canyon had the fewest number of individuals present, it had the highest species richness, evenness, and diversity (Table 4). Chincoteague had the second-greatest species richness, evenness, and diversity. Blake Ridge was the deepest site sampled in the Atlantic Ocean and was less diverse, even, and species-rich than the shallower sites. However, the opposite was true for the Gulf of Mexico sites: the deepest sites in this sample region displayed greater diversity, evenness, and species-richness than the shallower sites. Florida Escarpment had a greater species richness, evenness, and diversity than Brine Pool (Table 4). Florida Escarpment also had substantially more individuals present than any other sites sampled. The individual-based rarefaction curves indicate that the species sampled represent the population well because the curves all plateau (Fig. 3). As indicated by the multidimensional scaling plot of communities, the Florida Escarpment and Blake Ridge sites have the most similar species compositions (Fig. 4). The Bray-Curtis Resemblance matrix showed a 9.6% similarity between the two sites. They were both the deepest sites sampled in their respective oceanic basins. Baltimore Canyon and Chincoteague, both found in the Atlantic Ocean, varied greatly in depth but showed a 5.3% similarity in species present (Fig. 4).

4. DISCUSSION

In this study, Florida Escarpment (3287 m) and Blake Ridge (2167 m) were characterized by the same foundation species, *Bathymodiolus heckarae,* and were the two deepest sites sampled. However, they were located in different ocean basins. Baltimore Canyon (388 m) and Chincoteague (1028 m) were found close together along the western Atlantic margin and were characterized by the same foundation species, *Gigantidas childressi*, but had a substantial difference in depth. This study found evidence that the site with the most species richness was Baltimore Canyon (388 m). I hypothesize that runoff from Chesapeake Bay may have been supporting increased productivity—and therefore, species richness—at this site. Throughout the Atlantic Equatorial belt, species richness is often highest at seeps of intermediate depth (between 1000-2000 m) where deep and shallow species overlap, supporting the previously-described bathymetric boundaries by Turner et al. (2020). The similarity found between Florida Escarpment and Blake Ridge only partially supports the hypothesis that sites at similar depths have species compositions that are more alike. Similarity was also found between Chincoteague and Baltimore Canyon, but the sites were located at different depths. Brine Pool and Bush Hill also had alike species compositions, though their similarity was not supported by statistical analysis. This study suggests that depth plays an important role in the composition of seep communities by influencing nutrient availability.

When considering the bathymetric boundaries responsible for community settlement, the larval dispersal of the invertebrates sampled in this paper must be considered as a potentially-important factor. How and when these immature species settle can be helpful in determining why species are found at some sites and not others. Variation in population connectivity can result from differences in the timing and location of spawning, hydrodynamic processes, larval behavior, and post-settlement processes such as emigration and mortality (VanDover et al., 2002). As there was a wide range of species found throughout the sites sampled, there were many different larval forms, lifespans, and factors

contributing to the differences in communities.

The potential of larval dispersal is dependent on biological factors such as vertical migration, buoyancy of embryos, predation, food availability, developmental rate, physical tolerances, and planktonic larval duration (Cordes et al., 2007; Young et al., 2012) and is assumed to influence the habitat range of adult conspecifics (Thorson, 1950). Due to the wide range of depths sampled in this study, there are several different filtering factors that determined which larvae are able to settle at these respective sites. Behaviors that determine larval depth may be especially key to deep sea community composition due to the increased variability of current speed and direction at different depths (McVeigh et al., 2017). As most invertebrate larval forms are incapable of mobility—with the exception of vertical migration in the water column—they are highly dependent on currents to deposit them in a habitable environment. Therefore, larval dispersal is highly dependent on which currents are present in the vicinity of spawning. Gulf of Mexico metapopulations are likely to be sources for larval dispersal, while western Atlantic margin populations are likely to be sinks, indicating a unidirectional exchange (Young et al., 2012). If further studies are conducted on the topic, larval dispersal may be able to explain why there are species overlaps at the sites within the Gulf of Mexico. However, planktonic larvae are still subject to barriers such as seamounts, oceanic ridge axes, and other topography that may present an impediment to dispersal between basins (McClain and Hardy, 2007). The shallow straits of Florida have been known to create a biogeographical barrier to larval dispersal (McVeigh et al., 2017), a phenomenon which is pertinent to the present study. This barrier, among other factors, may be responsible for the minimal overlap of invertebrates among the sites sampled in the Gulf of Mexico with those in the Atlantic Ocean.

Foundation species patterns may also account for variation among sites. The biogenic habitats of the two most similar sites in this study—Blake Ridge and Florida Escarpment—are composed of *B. heckerae*. Further study of the larval journeys of each respective foundation species may also help to determine why the sites are characterized by different species. *Bathymodiolus heckerae* may rely on Gulf Stream meanders to be deposited into shallower depths. In the absence of Gulf Stream meanders, larvae likely remain in deeper waters and are transported south along the western boundary current, explaining why the deeper site mussel beds are comprised of *B. heckerae* (Cordes et al., 2007). The biogenic habitats of the other sites included in this study are composed of *Gigantidas childressi*. Habitat-building differences between *B. heckerae* and *G. childressi* may be responsible for the variability among sites' species compositions, though the impacts of foundation species composition are difficult to separate from those of depth. Variations in sites' chemical environments impact foundation species' growth rates and reproductive output. The environmental factors within the two ocean basins sampled favor *G. childressi,* which outcompetes *B. heckerae* for space and resources (Turner et al., 2020). *G. childressi* contain only methanotrophic symbionts, possibly creating a different chemical habitat than that of mussel beds composed of *B. heckerae. G. childressi* are also longer-lived and thrive closer to the surface, where faster currents may facilitate dispersal (Arellano et al., 2014). These environmental factors can help explain why the majority of the sites in this study are characterized by *G. childressi.*

Communities found at deep-sea methane seeps are essential for enhancing the productivity of deep-sea ecosystems, combating climate change, and boosting fishery yields. Therefore, understanding how anthropogenic actions affect these ecosystems is vital. Methane seeps provide habitat and food for various migratory deep-sea organisms by creating primary production and trophic levels that help structure the deep-sea food web (Turner et al., 2020). These ecosystems also furnish breeding and nursery sites that help maintain species

populations and bolster reproductive success (Beck et al., 2001). As such, seep communities may hold the key to maintaining a food and reproduction source for species often fished in commercial industries (Levin et al., 2016). Further, methane seeps are paramount to the ecological succession of the deep sea. Mussel taxonomy suggests that the decomposition of large bone and wood deposits may serve as successional steps for the introduction of mussel taxa to seeps, and, therefore, the support of chemoautotrophy-dependent invertebrates (Distel et al., 2000). Macro- and microorganisms at methane seeps and sulfate methane transition zones consume 75% of the methane that reaches the seafloor from subsurface zones (Ruff et al., 2015). This removal of methane from the seafloor allows for habitable environments to become established around these methane seeps where other invertebrates can then feed and settle. Furthermore, the rapidly-expanding deep-sea exploration movement enhances the urgency of understanding these interactions, especially as disturbances increase due to gas extraction, seabed mining, and bottom trawling (Levin et al., 2016).

5. CONCLUSION

The findings of this study only partially support the hypothesis. The two deepest sites, Florida Escarpment and Blake Ridge, had the greatest similarity. However, Baltimore Canyon and Chincoteague were found at different depths but still had a similar species composition. Although there were very few species found across multiple sites, the results of this study highlight the uniqueness of seep communities in the deep sea. The differences in seep community composition across the Gulf of Mexico and the western Atlantic margin include depth, foundation species, larval dispersal, and biogeographical barriers. Seep communities are relatively understudied due to the difficulties paired with accessing the deep sea, with the limitations of currently-available technology acting as a constraining factor on our overall understanding of these ecosystems. Methane seeps are paramount to the ecological succession of the deep sea, providing a habitat for invertebrates as well as a food source for migratory species. Therefore, as our technological capabilities improve, it is recommended that further studies be conducted to better understand the succession of seep communities, how they may influence fisheries, and finally, how they interact with other deep-sea habitats, with the end goal of advancing conservation efforts and limiting anthropogenic effects.

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FIGURES

Table 1. Presence (1) and absence (0) of all species found at sites, from both 2019 and 2021.

Species	Brine Pool	Bush Hill	Fl. Escarpment	Blake Ridge	Baltimore Canyon	Chincoteague
Cnidaria						
Anemone sp.1	0	0	0	1	0	0
Anemone sp.2	0	0	1	0	0	0
Sponge cf. Sycon	0	0	0	0	1	0
Sponge sp.1	0	0	0	0	1	0
Sponge sp.2	0	0	0	0	1	0
Zoanthinaria	1	0	0	0	0	0
Nemertea						
Nemertean sp.1	0	0	0	0	1	0
Annelida						
Sipunculid						
Sipunculid sp.1	0	0	0	1	0	0

Sipunculid sp.2	0	0	0	0	1	0
Sipunculid sp.3	0	1	0	0	0	0
Polychaeta						
Cossura sp.1	0	0	0	1	0	0
Laubierus mucronatus	0	0	1	0	0	0
M. dendrobranchiata	1	0	0	0	0	0
Nereis sp.1	0	0	0	0	0	1
Nicomache sp.1	0	0	0	0	1	0
Nicomache sp.2	0	0	0	1	0	0
Nicomache sp.3	0	0	0	0	0	1
Polychaetae sp.1	0	0	0	0	1	0
Polychaeta sp.2	0	0	0	0	0	1
Polychaeta sp.3	0	0	0	1	0	0
Polychaeta sp.4	0	0	0	0	0	1
Oligochaete						
Oligochaete sp.1	0	0	0	0	1	0
Oligochaete sp.2	0	0	0	0	0	1
Tubeworm sp.1	0	0	0	1	0	0
Mollusca						
Bivalvia						
Bathymodiolus sp.1	1	0	0	0	0	0
Ladella sublevis	0	0	1	0	0	0
Gastropoda						
Fucaria sp.1	0	0	1	0	0	0
Snail sp.1B	0	0	0	0	1	0
Snail sp.2A	0	0	0	1	0	0
Snail sp.2B	0	0	0	1	0	0
Snail sp.3A	0	0	0	0	1	0
Solariella sp.1	0	0	0	0	0	1
Provanna sp.1	0	0	0	0	0	1
Snail sp.5B	0	0	0	0	0	1
Snail sp.6B	0	0	0	0	0	1
Prosipho sp.1	0	0	1	0	0	0
Provanna sp.2	0	0	1	0	0	0
Snail sp.9B	0	0	0	0	0	1
Snail sp.10B	0	0	1	0	0	0
Mohnia sp.1	1	0	0	0	0	0
Whelk sp.1B	0	0	0	0	1	0
Eosipho c.f. canetae	1	0	0	0	0	0
Whelk sp.2B	0	0	0	0	0	1
Whelk sp.3A	0	0	1	0	0	0
Whelk sp.3B	0	0	0	0	0	1
Eulepetopsis c.f. vitrea	0	0	1	0	0	0
Polyplacophora						
Chiton sp.1	1	0	0	0	0	0
Leptochiton sp.1	1	0	0	0	0	0
Arthropoda						
Alvinocaris stactophila	0	1	0	0	0	1
Alvinocaris sp.1	0	0	0	1	0	0
Alvinocaris muricola	0	0	0	1	0	0
Alvinocaris williamsi	1	0	0	0	0	0
Amphipod sp.1	0	0	0	1	0	0
Isopoda sp.1	0	0	0	0	1	0
Munidopsis sp.1	1	1	0	0	0	0
Munidopsis sp.2	0	0	0	1	0	0
Shrimp sp.1	1	0	0	0	0	0
Echinodermata						
Asteroidea						
Juvenile steroid sp.1	0	0	0	0	0	1
Schlerasterias tanneri	0	0	1	0	0	0
Ophiuroidea						
Ophioctenella acies	0	0	1	1	0	0
Juvenile ophiuroid sp.1	0	0	1	0	1	1
Holothuroidea						
Chiridota sp.	0	0	1	1	0	0
Sea cucumber sp.1	0	0	1	0	0	0

Table 2. Total species list and counts from 2021.

Species	Brine Pool	Fl. Escarpment	Blake Ridge	Baltimore Canyon	Chincoteague
Cnidaria					
Sponge cf. Sycon	0	0	0	1	0
Sponge sp.1	0	0	0	1	0
Sponge sp.2	0	0	0	5	0
Nemertea					
Nemertean sp.1	0	0	0	1	0
Annelid					
Sipunculid					
Sipunculid sp.2	0	0	0	1	0
Polychaeta					
Laubierus mucronatus	0	1	0	0	0
M. dendrobranchiata	10	0	0	0	0
Tubeworm sp.1	0	0	1	0	0
Mollusca					
Bivalvia					
Ladella sublevis	0	25	0	0	0
Gastropoda					
Snail sp.1B	0	0	0	2	0
Snail sp.2B	0	0	0	9	0
Solariella sp.1	0	0	0	0	300
Provanna sp.1	0	0	0	0	835
Snail sp.5B	0	0	0	0	346
Snail sp.6B	0	0	0	0	835
Prosipho sp.1	0	20	0	0	0
Provanna sp.2	0	2000	0	0	0
Snail sp.9B	0	0	0	0	2
Snail sp.10B	0	3	0	0	0
Whelk sp.1B	0	0	0	15	0
Whelk sp.2B	0	0	0	0	4
Whelk sp.3B	0	0	0	0	4
Eulepetopsis c.f. vitrea	0	2603	0	0	0
Polyplacophora					
Leptochiton sp.1	4	0	0	0	0
Arthropoda					
Amphipod sp.1	0	0	80	0	0
Munidopsis sp.1	150	0	0	0	0
Munidopsis sp.2	0	0	2	0	0
Shrimp sp.1	8	0	0	0	0
Echinodermata					
Asteroidea					
Juvenile steroid sp.1	0	0	0	0	1
Ophiuroidea					
Ophioctenella acies	0	1268	11	0	0
Juvenile ophiuroid sp.1	0	20	0	1	3
Holothuroidea					
Chiridota sp.1	0	29	0	0	0

Table 3: Presence/absence of species from 2019.

Species	Brine Pool	Bush Hill	Fl. Escarpment	Blake Ridge	Baltimore Canyon	Chincoteague
Cnidaria						
Anemone sp.1	0	0	0	1	0	0
Anemone sp.2	0	0	1	0	0	0
Zoanthinaria	1	0	0	0	0	0
Annelida						
Sipunculid						
Sipunculid sp.1	0	0	0	1	0	0
Sipunculid sp.2	0	0	0	0	1	0
Sipunculid sp.3	0	1	0	0	0	0
Polychaeta						
M. dendrobranchiata	1	0	0	0	0	0
Cossura sp.1	0	0	0	1	0	0
Macrochaeta clavicornis	0	0	0	0	1	0
Nereis sp.1	0	0	0	0	0	1
Nicomache sp.1	0	0	0	0	1	0
Nicomache sp.2	0	0	0	1	0	0
Nicomache sp.3	0	0	0	0	0	1
Polychaetae sp.1	0	0	0	0	1	0
Polychaeta sp.2	0	0	0	0	0	1
Polychaeta sp.3	0	0	0	1	0	0
Polychaeta sp.4	0	0	0	0	0	1
Oligochaete						
Oligochaete sp.1	0	0	0	0	1	0
Oligochaete sp.2	0	0	0	0	0	1
Mollusca						
Bivalvia						
Bathymodiolus sp.1	1	0	0	0	0	0
Gastropoda						
Fucaria sp.1	0	0	1	0	0	0
Snail sp.2A	0	0	0	1	0	0
Snail sp.3A	0	0	0	0	1	0
Mohnia sp.1	1	0	0	0	0	0
Eosipho c.f. canetae	1	0	0	0	0	0
Whelk sp.3A	0	0	1	0	0	0
Sea Slug sp.1	0	0	1	0	0	0
Polyplacophora						
Chiton sp.1	1	0	0	0	0	0
Leptochiton sp.1	1	0	0	0	0	0
Arthropoda						
Alvinocaris stactophila	0	1	0	0	0	1
Alvinocaris sp.1	0	0	0	1	0	0
Alvinocaris muricola	0	0	0	1	0	0
Alvinocaris williamsi	1	0	0	0	0	0
Isopoda sp.1	0	0	0	0	1	0
Munidopsis sp.1	1	1	0	0	0	0
Echinodermata						
Asteroidea						
Schlerasterias tanneri	0	0	1	0	0	0
Holothuroidea						
Chiridota sp.1	0	0	0	1	0	0
Sea cucumber sp.1	0	0	1	0	0	0

Table 4: Collection and diversity information for each site sampled in this study, for both 2019 and 2021. Species richness, abundance, and diversity indices do not include the mussel foundation species. The following abbreviations are used: S (species richness), N (number of individuals), d (Margalef's Richness), J' (Pilou's Evenness), and H' (Shannon Weiner Diversity).

Site	Longitude	Latitude	Depth(m)	Foundation species	S	N	d	J'	H'(loge)
Baltimore Canyon	-73.822	38.048	388	*G. childressi*	9	39	2.184	0.7878	1.731
Blake Ridge	-76.191	32.494	2167	*B. heckerae*	4	94	0.6603	0.3741	0.5186
Brine Pool	-91.279	27.723	651	*G. childressi*	4	172	5828	0.3714	0.5149
Bush Hill	-91.504	27.776	562	*G. childressi*	-	-	-	-	-
Chincoteague	-74.102	37.541	1028	*G. childressi*	9	2330	1.032	0.6019	1.322
Florida Escarpment	-84.911	26.028	3287	*B. heckerae*	9	5969	0.9201	0.5232	1.15

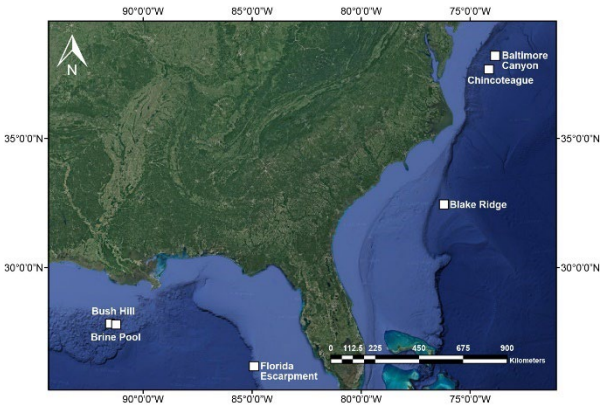

Figure 1: Map of the sites used in this study from both the 2019 and 2021 cruises. A green box indicates the site with the corresponding dive number.

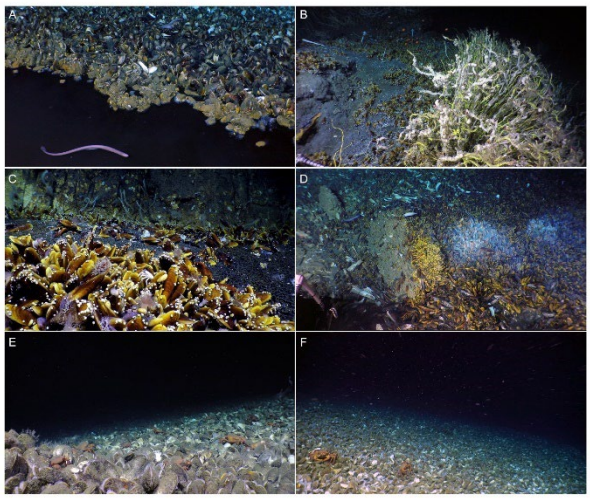

Figure 2: Photographs of each individual site. (A: Brine Pool; B: Bush Hill; C: Florida Escarpment; D: Blake Ridge; E: Chincoteague; F: Baltimore Canyon).

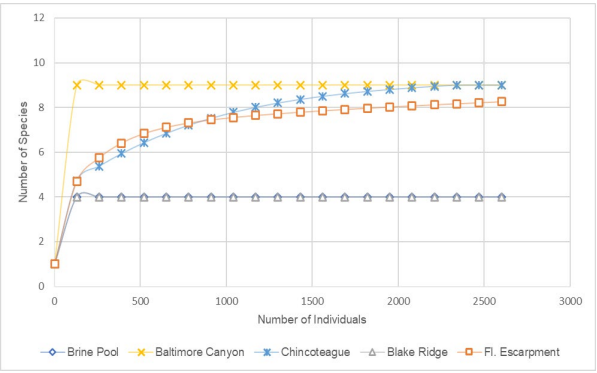

Figure 3: Species accumulation curves for mussel-associated fauna using 2021 data. Note: Brine Pool line is directly underneath Blake Ridge and thus not fully visible.

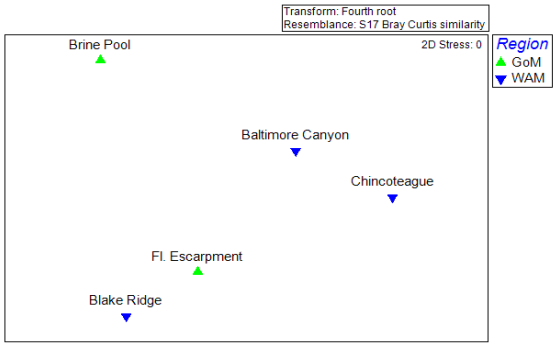

Figure 4: Multidimensional scaling plot of community similarity among mussel associated communities. Similarity is estimated by the Bray-Curtis similarity index based on fourth-root transformed species densities using 2021 data (GoM=Gulf of Mexico; WAM=Western Atlantic margin).

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