



JOURney

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Letter From the Editor

Dear Reader,

The entire editorial board and staff are pleased to present the second annual volume of the University of North Carolina's Journal of Undergraduate Research (UNC JOURney). This journal expresses the wide variety of academic disciplines and opportunities the University of North Carolina at Chapel Hill (UNC-CH) offers students. The seven articles published in this editions explore the social sciences, humanities, and natural sciences. I hope the growth UNC JOURney and other student engagement from the Office for Undergraduate Research (OUR) continue to spur and inspire students to engage in research opportunities on and off campus.

The goal of UNC JOURney in the overall OUR student engagement ecosystem serves to give students a place to publish faculty-mentored research, including SURF projects, partial and full honors theses, and other independent research. UNC JOURney is an annual journal dedicated to celebrating and supporting the original research conducted early in students' academic careers that reflects appropriate scope and complexity for excellent undergraduate work.

UNC JOURney would not have been possible without our dedicated editorial and publicity board. I would like to thank all of our section editors and publicity team members. Next, a huge than kyou to my managing editor Maggie Hilderbran ('19) and publicity director Sean McCaffery ('20). Their ideas, passion and leadership on this edition have carried us to publication, and I could not be prouder to have served as their editor-in-chief. Lastly, I am wishing the best of luck to next year's co editors-in-chief April Wang and Zoe Hazerjian.

I would also like to acknowledge the unwavering support of OUR. They have continuously offered their guidance during the second year of this venture on campus. Specifically, I want to thank Associate Dean and Director Troy Blackburn (Department of Exercise and Sports Science), Associate Director Monica Richard, Associate Director Boots Quimby, and Business Services Coordinator Denise Carter.

Lastly, thank you to everyone who submitted a manuscript for consideration in this edition of UNC JOURney and to our readers for taking the time to explore and learn about the research occurring at UNC-CH. Please enjoy this second edition of UNC JOURney; the entire staff and I hope that you enjoy these unique and interesting pieces of research.

Sincerely,



Gabi Stein
Editor-in-Chief

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The AP United States History Curriculum: A Battle Between Historical Perspectives

by Sarah Cheely

An updated version of The College Board's AP United States History course curriculum was released in 2014 but faced conservative backlash for its revisionist historical perspectives. The College Board once again updated its curriculum in response to the backlash. First, this paper explores the two most prevalent methods of historical teaching: revisionist history and American exceptionalism. This is done in the form of a literature review that analyzes scholars' work on K-12 history education and scholars' different interpretations of American exceptionalism. Primarily, this research paper seeks to discover significant changes between the 2014 curriculum and subsequent versions of the curriculum. By conducting a content analysis of the 2014 and 2017 curriculums, it is found that the American exceptionalism perspective was the more dominant perspective in the 2017 version, while revisionist had been the more dominant perspective in the 2014 version. Specifically, the 2017 version demonstrated an American exceptionalism perspective due to: support for the modern conservative movement, greater emphasis on the sanctity of America's beginnings, wording differences in the two curriculums, and decreased emphasis on teaching historical thinking skills to students. The paper concludes that the 2014 conservative backlash affected the course curriculum in a negative manner and argues for the revisionist method of teaching history to students.

Keywords: AP United States History Curriculum, Revisionist History, American Exceptionalism, K-12 history education, Conservative influences on historical teaching

Introduction

Advanced Placement United States History, henceforth in this paper referred to as APUSH, released an updated curriculum framework in 2014 after nearly a decade of revising the previous curriculum framework. The College Board, the parent company that administers Advanced Placement courses and exams, quickly faced conservative backlash in response to the new curriculum. Ben Carson—even before he was a Republican presidential candidate—claimed that APUSH students would have such anti-American perspectives after completing the course that they would want to join ISIS (Strauss, 2014). In response to the conservative criticism, The College Board released a new curriculum in 2015. This update helped to appease conservative critics, but brought new liberal backlash.

History courses have stirred up controversy long before the 2014 APUSH curriculum change. I have summarized the two most prevalent perspectives on how history, specifically United States history, should be taught. The first group can be labeled as the “revisionist perspective.” This cohort encourages an APUSH

curriculum that promotes critical thinking of American history, even if that means questioning decisions in America's past (Levy, 2016). On the political spectrum in present-day America, liberals (and thus, the Democratic Party) are most often supportive of this perspective. I have defined the second group as the “American exceptionalism perspective.” This perspective argues that the 2014 APUSH curriculum views American history in a negative way and expresses anti-American sentiments. They prefer a curriculum with patriotic undertones that promotes a history in line with American exceptionalism, the belief that the United States is uniquely superior to other nations (Levy, 2016).

In this document, I seek to answer the question: How does the 2014 version of the Advanced Placement United States History curriculum differ from subsequent versions? I will compare the 2014 version and a later version of the APUSH curriculum to see how the curriculum was re-written in response to the conservative backlash to the 2014 curriculum. Prior research has only gone so far as newspaper articles, such as the NPR and Newsweek articles I cited in my research, and there has not been an

in-depth sociological study about the fundamental framework of the APUSH curriculum. I find that the APUSH curriculum has a greater emphasis on the American exceptionalism perspective in versions of the curriculum after the 2014 conservative backlash. I argue that the biased curriculum changes themselves are indicative of the need for critical thinking and perspective taking in historical analysis. Thus, I argue for a revisionist method of teaching history, particularly for teaching APUSH.

Limitations & Motivations

Since the controversy surrounding the updated curriculum happened relatively recently (approximately three years ago at the time of this study), there has not yet been an in-depth comparison of the two APUSH curriculums that I will compare outside of newspaper articles and magazines. How could the outside political influences affect students' knowledge of US history, their fundamental beliefs about the US, and how well will they be prepared for college history courses and global citizenship in a world that requires them to think critically about relevant issues? Politics and education are intertwined and may impact how students learn about the US and how they view their own identity as citizens of the US.

Literature Review & Prior Research

In this section, I will explain the two approaches to teaching history in schools: the revisionist and American exceptionalism perspectives. I begin by summarizing and analyzing literature that corresponds with the revisionist perspective, and then doing the same for literature that corresponds with the American exceptionalism perspective. I conclude by evaluating which perspective I believe should be practiced.

There are two sides to history: the "sacred" and the "profane" (Waters, 2007). The "sacred" are the morally right and selfless acts in American history, which are memorialized with totems, rituals, and sacrificial heroes that recreate the sacred aspects of history in the public eye (Waters, 2007). This philosophical ideal aligns with the American exceptionalism perspective. The "profane" are the selfish impulses that cause the country's failings and prevent America from living up to its sacred ideals; it is the reality of the world (Waters, 2007). This category aligns with the revisionist perspective, as it requires more critical thinking to synthesize all of the information and perspectives of a situation. Inevitably, there is tension between the sacred and profane perspectives (in other words, tension between the conservative and liberal perspectives). College history courses teach the "profane" side of history while K-12 teaches the "sacred" side (Waters, 2007). Thus, college students practice more critical thinking about the historical issues that affect current social change than primary and secondary students. Often, students are taught a more positive "glass half-full" approach (which aligns with American exceptionalism) in K-12 and a more critical "glass half-empty" approach (which aligns with the revisionist perspective) in college (Waters, 2007). The revisionist method of teaching equips students with the skills to analyze evidence and think critically about their country's failings, as students are presented with the "profane" side of history and forced to reconcile it with the "sacred" side that they learned in earlier grades.

The field of women's history has long been treated as "profane" and excluded from the curriculum, even though it explores the

history of approximately half of the population. While there has been a greater emphasis on women's history in college courses over the last few decades, K-12 curriculums have not done the same and still lack women's history (Winslow, 2013). The inclusion of women's history in the history curriculum of younger grades would coincide with the revisionist perspective of history education, since students would learn about a broader range of topics, increase their gender awareness, and question the status quo at an earlier age. Collaborations between history departments at colleges and secondary schools could bridge the gap and incorporate gender awareness into secondary school curriculums, but colleges usually do not want to associate with K-12 (Winslow, 2013). Teaching programs at colleges do not usually include courses on teaching women's history, so the teachers are not prepared either (Winslow, 2013). Additionally, there has been a "narrowing of the curriculum" (Winslow, 2013, p. 324) in response to the accountability movement that favors test scores over breadth of learning, granting instructors less time to teach history. Teachers refuse to squeeze women's history into their (already) short time for history instruction since history instruction has been replaced with math and reading instruction for children to perform well on standardized tests (Winslow, 2013). When history is prioritized, teachers follow the state standards and only teach what will be on the test. Thus, teachers focus on economic and political history, which may be tested, and ignore social and cultural history (Winslow, 2013). When researchers reviewed the New York Regent's exam for history over a period of years, questions about women's history only comprised (on average) zero to three of the fifty questions (Winslow, 2013). Winslow advocates for future history instruction that will automatically include all people's history and not need to be divided up with a special field for women's history. Her argument aligns with the revisionist perspective that aims to analyze all history and not just the history of those who were historically powerful and wrote the history books.

Revisionist history promotes the inclusion of all people's histories, which British history education began to do successfully in the last decade of the twentieth century. Great Britain teaches the history of all of its regions (England, Northern Ireland, Wales, and Scotland) to ensure that students get a broad understanding of British history (Phillips, 1999). Great Britain's history teaching method (i.e. including the history of all British people) shows that American history education could also include all of its people's history (e.g. Native Americans, African-Americans). There was a distinctive Welsh curriculum established in Wales by the 1990s to teach students the history of their ancestors, rather than simply mainstream English history (Phillips, 1999). The Welsh curriculum, known as "Curriculum Cymreig," had its basis in the Welsh nation and culture and encourages cultivation of Welsh culture through teaching Welsh history, literature, art and religion (Phillips, 1999). Phillips describes this revitalization of Welsh instruction as "cultural restoration" (Phillips, 1999, p. 362). Phillips argues that history allows for cultural transmission and leads to how imagined communities and people view themselves. When the Welsh curriculum (and British history curriculum as a whole) was being constructed in the 1990s, there were different perspectives on what (and, innately, whose) history should be included (Phillips, 1999). Some people wanted a nostalgic perspective, but curriculum-writers fought for (and were successful in

creating) a curriculum with a “broad-based vision of Britishness” that required British students to evaluate their position in the post-colonial world, analyze their role in Europe, and to consider the relationship of mainland Britain to the British Isles (Phillips, 1999, p. 361). Britain’s method of teaching history promotes learning about the history of its entire population and thus aligns with the revisionist perspective.

Why do teachers and school boards not include everyone’s history in their lessons? It is likely that many teachers and politicians (particularly conservatives in this case) do not want to discuss uncomfortable topics in American history that may not frame Americans in a positive manner. However, Dr. Cameron McCarthy and Dr. Yolanda Sealey-Ruiz (2010) argue that educators must teach the uncomfortable events of the past so that students can see how people previously dealt with oppression. They remain firm that it is impossible to teach complex historical themes (such as slavery) in simple terms (McCarthy & Sealey-Ruiz, 2010). While simple terms may allow students (particularly children) to comprehend the material easier, it “disempowers” people who were involved in the making of history and the people who live their lives based on their interpretations of history (McCarthy & Sealey-Ruiz, 2010, p. 75). If teachers are afraid to teach the past, then they do not allow students to properly understand the past or their present situations (McCarthy & Sealey-Ruiz, 2010). In their article, McCarthy and Sealey-Ruiz cite Eric Williams’ book on slavery as an example of “post-colonial pedagogy” and how to teach the uncomfortable truths of history (McCarthy & Sealey-Ruiz, 2010, p. 75). Teaching about the transatlantic slave trade opens the gates to many other topics that are interrelated—the West Indies, US, South America, Africa, and Europe are all linked through the transatlantic slave trade, and there is also a relationship between slavery and capitalism (McCarthy & Sealey-Ruiz, 2010). Societies have “deep-bodied hostility towards the people’s history” and actively suppress learning about the “lower orders” of people (McCarthy & Sealey-Ruiz, 2010, p. 76). This hostility is aided in how history is taught in schools to the masses and how teachers are taught to teach history—it is cyclical (McCarthy & Sealey-Ruiz, 2010). Secondary schools need to teach history as people’s history, rather than the history of specific interest groups (McCarthy & Sealey-Ruiz, 2010). Ignoring the West Indies’ history and its interrelated history across the region thus ignores the connections to African descendants’ current socioeconomic statuses around the Western Hemisphere (McCarthy & Sealey-Ruiz, 2010). It is imperative to show how slavery shaped our present society (McCarthy & Sealey-Ruiz, 2010). Schools “sanitize” history to make it more palpable and thus ignore lots of Native American and African history—sanitizing history takes away the voices of entire groups of people (McCarthy & Sealey-Ruiz, 2010, p. 82). This article strengthens the revisionist argument because it emphasizes that teaching exceptionalism fails in the long run by ignoring groups of people that still exist and feel the effects of historical inequities.

The second perspective on how to teach US history, the American exceptionalism perspective, promotes an APUSH curriculum that focuses on the positive aspects of American history. Younger students are usually taught this perspective, meaning that K-12 education fails to teach students about the less appealing parts of history that do not have such overt patriotic messages. Since APUSH is a college course taught in a K-12 setting, it walks the

line between the sacred and the profane, which breeds controversy. School boards are elected to uphold the ideals of society and always choose to reflect these ideals when choosing curriculums (Waters, 2007). Children cannot respect and live up to sacred ideals if they know the profane sides of the story, so Waters argues that “sacred” history must be taught first to instill patriotic ideals into children, for then they can learn the profane truths after they have a substantial patriotic background (2007). This article suggests that teaching exceptionalism may be beneficial to younger students and that revisionist perspectives should not be taught until students are older.

When approaching the debate on how to teach history, politicians are sharply divided across party lines. Conservative politicians are outspoken about wanting an APUSH curriculum that focuses on American exceptionalism (Kamenetz, 2015). NPR journalist Anya Kamenetz calls APUSH the closest thing to a national history curriculum, since more than half a million students took the test in 2016 (Kamenetz, 2015). The 2014 APUSH curriculum focused on “debating ideas instead of regurgitating facts” (Kamenetz, 2015). The Republican National Convention called it “radically revisionist” (Turner, 2015). Georgia state senator William Ligon claims that the 2014 version does not show “the things that unite us and set us apart from much of the rest of the world” (Turner, 2015). Senator Ligon seems to advocate for an American exceptionalism perspective. The states opposed to the 2014 APUSH curriculum included many traditionally conservative states: Texas, Georgia, Nebraska, North Carolina and Tennessee (Turner, 2015). The population that comprises the Republican Party has historically enacted racist legislation throughout US history, and many politicians in the party seem to support the American exceptionalism perspective to prevent students from analyzing the hypocrisy of their own historical actions.

In a situation similar to how American history often avoids teaching its racist past, South African high school history education avoids teaching about the racism of apartheid (Teeger, 2015). By ignoring an element of the nation’s history (i.e. apartheid and its racist policies), the children are not getting a comprehensive history education, which contributes to societal biases (Teeger, 2015). The South African history teachers tell “both sides of the story” on apartheid—thus, they teach children that whites and blacks cannot automatically be placed into categories as either the perpetrators or victims in apartheid (Teeger, 2015, p. 1185). This is done “to mitigate race-based conflict,” but really it contributes to “colorblindness” (and thus poor race relations and understandings) (Teeger, 2015, p. 1175 & 1193). Students do not acknowledge how apartheid still has repercussions on race in their current society and thus prevents them from addressing and trying to solve the racial inequalities that continue to this day (Teeger, 2015). The curriculum passes down an implicit denial of past racial oppression and a denial of present racism and racial discrimination, thus allowing racial inequality still present today to continue (Teeger, 2015). However, racial injustice does not actually end just because society refuses to acknowledge it (Teeger, 2015). This article details why teaching exceptionalism creates more problems that could have been avoided with a revisionist method of teaching. The American exceptionalism teaching method contributes to misguided ideas about race and a lack of understanding about current racial struggles.

In contrast, sociologist Seymour Martin Lipset defined Amer-

ican exceptionalism as “the distinctiveness of American society,” rather than calling the US superior to others (Torpey, 2009, p. 143). He argues that exceptional is not used as a word to show that the US is better, but to point out what is different in the US. He argues that the US is exceptional because of its politics, religion, and race, and because it was “the first new nation” when it separated from England and created its now-famous American democratic ideals (Torpey, 2009, p. 144). Later on, in the years following World War II, “American exceptionalism” was a term used to differentiate Americans from the (also “exceptional”, but in negative ways) Nazis (Torpey, 2009, p. 144). The term came to highlight the positive aspects of the US and downplay the not-so-positive aspects (Torpey, 2009). While Lipset’s view of American exceptionalism may be one interpretation, it is not the interpretation most prevalent in US history education that follows American exceptionalism. American exceptionalism continues to most often imply a blind defense of past US actions.

While American exceptionalism may have always been present in history curriculum, political scientist Taesung Cha’s article “American Exceptionalism at the Crossroads: Three Responses” describes American exceptionalism as a concept revitalized by the neoconservative movement in the last decades of the 20th century and into the 21st century (2015). It was especially revitalized during the Bush Administration when it was used as a trademark of American foreign policy in the wake of 9/11 (Cha, 2015). Specifically, the Bush Doctrine demonstrated a return to the heyday of American exceptionalism (Cha, 2015). Cha theorizes that America has turned back to the idea of American exceptionalism during its “identity crisis” in current times, after decades of conflict with the Middle East (Cha, 2015, p. 352). The country is using the term to determine what role America should have in the global setting (Cha, 2015). Cha’s article advances the position that American exceptionalism benefits students, especially in uncertain times when patriotism is essential for the country’s unity and success.

There are many arguments for why American exceptionalism is beneficial to students’ learning of US history. I do acknowledge that it may be beneficial for teaching them to love their country and hold patriotic values. However, American exceptionalism can do more harm than good, as it does not prepare students for real-world situations in which they must critically analyze the country’s past and present to determine its future.

Research Design

To complete the study, I performed a content analysis of the 2014 and 2017 curriculum frameworks in order to see how The College Board altered the curriculum in response to conservative backlash (The College Board, 2014 & 2017). I coded for any differences between the two curriculums and qualitatively analyzed those differences across different themes to see patterns that emerged. Based on the emergent findings, I compared how they related to the revisionist and American exceptionalism perspectives. Some sections of the curriculum—for example, the section on the “Founding Documents”—were not present in both curriculums, but that also allowed for further analysis into the possible motives behind the inclusion or exclusion of certain phrases, paragraphs, or entire sections in one version and not the other. While there is a myriad of changes I could analyze, I chose to focus on the differences that I found most prevalent and significant

to the overall changes in the APUSH curriculum. In particular, I analyze the changes to the curriculum that appear to align more with the modern-day conservative movement in the 2017 curriculum than the 2014 curriculum, since the conservative backlash was the cause of the curriculum updates after 2014.

Analysis

This section explains some of the most prevalent differences that I observed between the 2014 and 2017 curriculums. The analysis shown here is by no means exhaustive; the examples were reduced due to space limitations.

Support for the Modern Conservative Movement:

There are changes in the two final sections of the 2017 curriculum (the sections devoted to the time periods of 1945-1980 and 1980-present) that appear to align more with the current conservative movement than these two sections did in the 2014 curriculum. The 2014 curriculum states that America was “struggling to live up to its ideals” in the time period 1945-1980, which was the period of the rise of conservatism (College Board, 2014, p. 72). Conservatives still hold the same fundamental beliefs and would disagree that they were not living up to the country’s ideals that they value so highly.

There are multiple additions in the 2017 curriculum that emphasize the greatness of President Ronald Reagan, such as the assertion that his foreign policy was a wild success and “continued in later administrations” (College Board, 2017, p. 97). Reagan is known as the father of the modern conservative movement, and his election signified a new emphasis on conservative policies. In the 2017 curriculum, he embodies the conservative movement. There is an entire sub-category devoted to Reagan and his administration. He is the only president (or individual person) to whom an entire sub-category is devoted. This demonstrates his significance to the conservative movement. The points of the sub-category display Reagan’s power by implying that he and his interventionist policies ended the Cold War (regardless of the fact that the Soviet Union’s demise was imminent) through his implementation of “speeches, diplomatic efforts, limited military interventions, and a buildup of nuclear and conventional weapons” (College Board, 2017, p. 97). However, the 2014 curriculum directly contradicts the assertion that Reagan increased the nation’s weapons arsenal. The 2014 curriculum states that Reagan developed a “friendly relationship” with the Soviet leader at that time Mikhail Gorbachev, which resulted in a “significant arms reduction by both countries” (College Board, 2014, p. 79). The 2017 curriculum likely omitted the relationship between Reagan and Gorbachev because it weakens the claim that Reagan was hard on Communism and the Soviet Union. It does not support the idea that Reagan was tough on American enemies, which counters the American exceptionalism perspective that American presidents are the strong, sacred, honest leaders of the country.

The new curriculum emphasizes the superiority of capitalism, which is a tenet of modern conservatism. The 2014 curriculum explicitly states that the US became entangled in “increasingly complex foreign policy issues,” ranging from shifting political alliances to the global economy (College Board, 2014, p. 72). The economic prosperity is painted differently in the two curriculums. The 2017 curriculum claims that economic productivity increased in the period from 1980 to the present and that “new

developments in science and technology enhanced the economy” (College Board, 2017, p. 95), while the 2014 curriculum states that “the increasing integration of the United States into the world economy was accompanied by economic instability” (College Board, 2014, p. 80). Once again, the two curriculums are diametrically opposed. The rise of big business is also presented differently in the two curriculums. In 2014, large-scale production “fueled the development of a ‘Gilded Age’ marked by an emphasis on consumption, marketing, and business consolidation” (College Board, 2014, p. 61). However, in 2017, large-scale production “generated rapid economic development and business consolidation” (College Board, 2017, p. 66).

Perhaps the most obvious example of the clashing of revisionist and American exceptionalism perspectives in the 2017 curriculum is the final bullet point of the entire curriculum framework: “Despite economic and foreign policy challenges, the United States continued as the world’s leading superpower in the 21st century” (College Board, 2017, p. 98). This statement overtly advocates for the American exceptionalism perspective and praises recent political developments. In turn, this praises conservatism since it has been the main ideology on the rise few the past few decades. This statement was not present in the 2014 version; it was only added after conservative backlash.

America’s Beginnings:

In 2017, there is a greater emphasis on the sanctity of America’s founding. Even though the curriculum’s overview was shortened, two additional paragraphs were included on the instruction of the founding documents (e.g. Bill of Rights and Declaration of Independence). A common criticism of the 2014 curriculum was its failure to explicitly mention names of the founding documents and fathers. Throughout the 2017 curriculum, there are multiple references to specific people. One of the themes, focused on the country’s national identity, previously gave “special attention...to the formation of gender, class, racial, and ethnic identities” (College Board, 2014, p. 21), but that statement was replaced to devote attention to “topics such as citizenship, constitutionalism, foreign policy, assimilation, and American exceptionalism” (College Board, 2017, p. 12). The emphasis on sub-identities within the national identity was replaced with overtly patriotic lingo. The 2017 curriculum shifts attention from the diversity of the United States to focus on the country’s creation by (mostly) white males.

Changes in Word Choice:

The 2017 version utilizes minor re-wordings and edits—through omissions and less harsh diction—to downplay America’s faults. Previously, the subjugation of Africans and Native Americans was defended by a “belief in white superiority” (College Board, 2014, p. 35), but now the curriculum cites “religious, cultural, and racial justifications” (College Board, 2017, p. 25). The 2017 version removes explicit references to skin color; for example, the phrase “white and nonwhite people” is no longer present (College Board, 2014, p. 34). They give less emphasis to controversial wordings and events, along with lessening the references to minorities’ contributions. The events in America’s past that we now view as good are highlighted, while the events in America’s past that we now view as bad are glossed over. When discussing slavery in the early 19th century, the 2014 curriculum states that Southerners took pride in the institution of slavery, but

in 2017 they made sure to take the moral stain off of the region by claiming that “the majority of Southerners owned no slaves” (College Board, 2017, p. 55).

The Shrinking Importance of Historical Thinking Skills:

The 2014 curriculum dedicates eight pages to describing the historical thinking skills that teachers should help their students develop throughout the course. These historical thinking skills are: chronological reasoning, comparison and contextualization, crafting historical arguments for historical evidence, and historical interpretation and synthesis. The 2017 curriculum condenses those eight pages into only two pages. While the historical thinking skills may have been condensed in the 2017 version to simplify the instruction for the teachers, I argue that it is representative of the new curriculum’s decreased emphasis on developing students’ critical thinking skills in history, since the critical thinking skills would align with the revisionist perspective. There were multiple statements present in the 2014 curriculum that were removed in the 2017 version. The 2014 curriculum explicitly states that it is “written in a way that does not promote any particular political position or interpretation of history”, but this is absent in the 2017 one (College Board, 2014, p. 10). In 2014, there were multiple paragraphs dispersed throughout the eight historical thinking skills pages that encourage students to debate and form their own opinions on historical events. This is best exemplified by the final statement in the section: “Students should be encouraged to challenge the narratives to which they are exposed so that they will have a better understanding of their place in an increasingly globalized and diverse world” (College Board, 2014, p. 19). These statements are omitted in the 2017 curriculum, demonstrating that critical thinking skills are not as important in this curriculum.

Conclusion

This study went past previous newspaper and magazine articles to conduct an in-depth study of the two curriculum frameworks. It examined how the curriculum changed and how the changes will affect the students’ ability to receive a proper history education that prepares them to think critically. My study contributed to the literature on history education and to the discussion on how history education should be taught, specifically American history in secondary schools, as exemplified by the APUSH curriculums.

I found that the APUSH curriculum after the 2014 conservative backlash contained more conservative rhetoric and conservative interpretations of US history. These conservative additions reflect an American exceptionalism philosophy rather than the revisionist philosophy seen in the 2014 APUSH curriculum. Most notably, the 2017 APUSH curriculum demonstrates an emphasis on modern conservative beliefs through its praise of Ronald Reagan, its positive outlook on capitalism, and its overt statement that America is the world’s “superpower” in the 21st century. Additionally, the 2017 curriculum emphasizes the sanctity of the founding of the US and utilizes minor re-wordings and edits to downplay America’s faults, both of which align with the American exceptionalism school of thought that views America as special and superior to other nations. Finally, the 2017 curriculum reduces the importance of developing historical thinking skills, which coincides with the American exceptionalism point

of view that does not want students to question America's past.

The APUSH curriculum was written by human beings with their own biases, whether they want to acknowledge it or not. There was also considerable external pressure from conservatives to modify the curriculum to coincide with their American exceptionalism ideology. I argue that the emphasis on American exceptionalism is dangerous and demonstrates a need for teaching students critical thinking and perspective taking in historical analysis. Therefore, history education should follow a revisionist perspective to best prepare students for responsible citizenship and make them aware of the historical realities that continue to affect the world around them in their everyday lives.

I suggest that future studies also evaluate the differences between APUSH curriculums in a variety of years to see how emphases and perspectives evolved. Researchers should also look at the end-of-year APUSH exam to see if either a revisionist or American exceptionalism perspective is present. Those interested in the teaching of history in the United States could also look into the differences in history curriculums besides APUSH at K-12 schools and universities across the country to see how the emphases and perspectives differ based on the dominant political ideologies in each state or region.

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AI Automation and High Unemployment: Should Human Workers Worry About High-Level Machine Intelligence (HLMI)¹ ?

by Babatunde Sunday Opaleye

In June 2017, Hawaii became the first state in the U.S. to legislate a Universal Basic Income (UBI) policy. The move is partly a response to the rapid progression of artificial intelligence (AI) automation and its increasing and impending effects on human labor, which continue to beckon more attention. This paper focuses on using existing statistical research and literature review on AI automation to argue that significant evidence exists to support the claim that AI automation will most likely lead to a higher unemployment on the part of human workers in the short term. It argues further that to meaningfully respond to this phenomenon, policymakers² and the government need to take this threat seriously. Like Hawaii, policymakers ought to also implement national policies such as UBI and Universal Basic Adjustment Benefit (UBAB) to provide basic financial and training safety net for all citizens, especially displaced workers.

Keywords: Artificial Intelligence (AI) Automation, Higher Unemployment, Policymakers, Universal Basic Income (UBI), Universal Basic Adjustment Benefit (UBAB)

We are being afflicted with a new disease of which some readers may not yet have heard the name, but of which they will hear a great deal in the years to come—namely, technological unemployment. — John Maynard Keynes (1930/1932, p. 364).

Introduction

On October 31, 2016, Massachusetts Institute of Technology (MIT) Review published an article³ authored by Vincent Conitzer⁴. Conitzer argues that the current level of Artificial Intelligence⁵ (AI) and AI automation⁶ neither justifies basic income nor poses an imminent threat to human labor. While Conitzer permits that his analysis on the progression of AI automation may be unwarranted, he, however, believes that the efficiency and cognitive levels of machines, relative to humans, are still significantly limited. Thus, the author asserts that concerning ourselves with welfare policies, such as basic income,

with the intent of tackling the implications of AI automation, especially in the short-term is unwarranted.

Although Conitzer makes relevant points in his article, his overall argument, however, implies an immediate apathetic approach towards the possible implications of AI automation in the workforce. In other words, AI automation debates should be suspended until most human workers begin to actually lose their jobs to sophisticated machines. However, this approach falls short against the mounting academic research and evidence showing that AI automation does pose a threat to human labor in the short term and that policymakers should take this threat seriously. In fact, the quest to examine AI automation threats continues to promote debates among academic researchers, economists, technology institutions, entrepreneurs, and policymakers (Boyd and Holton 2017; Suchman 2007; de Graaf, 2016; Ford, 2015; CEDA, 2015; Katja et al. 2017).

While more research is needed to address possible measures that policymakers can use to regulate AI automation and unemployment in the short and long term, available research, however, shows that “advances in artificial intelligence (AI) will transform modern life by reshaping transportation, health, science, finance, and the military” (Katja et al. 2017). Katja et al. (2017) predict

that there is a significant probability that “High-Level Machine Intelligence”⁷ (HLMI) will gradually replace nearly all-human jobs in North America by 2053, and sooner in other regions such as Asia and Europe (p. 1). They also note, “to adapt public policy, we need to better anticipate these advances,” and that their data “results will inform discussion amongst researchers and policy-makers about anticipating and managing trends in AI.”

Katja et al’s work and other research on AI automation, as will be shown later, continues to show that regardless of what drives the fear of AI automation, academic researchers, politicians, and technology experts are concerned about its uncertain implications. As such, this paper argues that the rapid use of AI automation will likely lead to a high unemployment that will be persistent in the short-term. However, Universal Basic Income (UBI) and Universal Basic Adjustment Benefit (UBAB) are policy frameworks that policymakers can use to mitigate the unemployment effects of AI automation in the short-term⁸. To do this, the paper first uses literature review and descriptive statistics research to support the first part of the argument. Second, this paper analyzes whether AI automation represents an unprecedented technological change. Finally, it concludes by discussing the need for UBI and UBAB, and how both serve as policy frameworks that policymakers can formulate to respond effectively to the high unemployment effects of AI automation.

Literature review on AI automation and likely high unemployment effects

Oxford University researchers, Carl Frey and Michael Osborne (2013) use a Gaussian process classifier to estimate the future likelihood and impact of AI automation on the U.S. labor market. Their findings show that about 47% of total U.S. employment is at a “high risk of computerization” over the next couple of decades – i.e. by the early 2030s (Frey and Osborne 2013). Richard Berriman and John Hawksworth (2017) also provide empirical data that further supports Frey and Osborne’s research. They show that future unemployment due to AI automation will be unprecedented and distinct from past technological displacements.

In addition, Katja et al’s (2017) empirical research paper, also asserts that the rising trend of “self-driving technology might replace millions of driving jobs over the coming decade” (p. 1). They also use “the results from a large survey of machine learning researchers on their beliefs about progress in AI” to provide a timeline for when full AI and AI automation will likely take place. According to Katja et al., AI researchers predict AI technology will outperform humans in many activities “in the next ten years, such as translating languages (by 2024), writing high-school essays (by 2026), driving a truck (by 2027), working in retail (by 2031), writing a bestselling book (by 2049), and working as a surgeon (by 2053)”⁹ (pp. 1-4). They add that “researchers believe there is a 50% chance of AI outperforming humans in all tasks in 45 years and of automating all human jobs in 120 years” in North America and sooner in Asia (pp. 1-4).

PricewaterhouseCoopers LLP (2017), a UK based economic research organization, also provides comparison empirical data to show how robots may impact employment in the near future. They predict that “up to 30% of UK jobs could potentially be at high risk of automation by the early 2030s, lower than the US (38%) or Germany (35%), but higher than Japan (21%)” (p. 30). They add that the “risks appear highest in sectors such as trans-

portation and storage (56%), manufacturing (46%) and wholesale and retail (44%), but lower in sectors like health and social work (17%)” (p. 30).

The statistical analysis above shows there is strong evidence that AI and AI automation will most likely replace most routine jobs in less than 50 years from now and possibly other non-routine cognitive jobs in a little over 100 years. And, if these predictions occur, the jobs of human workers, which currently accounts for half of all U.S. job sectors¹⁰, would be at a high risk of AI automation. Furthermore, if these strong predictions prove certain, non-routine cognitive labors, in the health and academic sectors for example, are also at a high risk of AI automation. Nevertheless, in spite of these imminent high unemployment forecasts, does AI automation represents an unprecedented technological change? If so, how could UBI and UBAB help mitigate the high unemployment effects of AI automation? The rest of this paper will focus on addressing these questions.

Is AI automation an unprecedented technological change?

The industrial revolution era is often cited as the modern precedent for recent technological and economic changes, including AI and AI automation, to argue that AI poses no new threats to human employment (Rotman 2017; Mokyr et al. 2015; Shestakofsky 2017). Conitzer’s arguments, as discussed in the introduction, seem to also imply similar reasoning that AI automation does not present any new meaningful threat to human labor than the technological changes experienced in the industrial revolution¹¹. In addition, those who hold this position further claim that technological changes in the industrial revolution actually favored human labor, in that it increased the overall economic production, and also led to the creation of numerous social and welfare programs (Bessen 2015).

In his analysis on the same subject, David Autor notes that heavy manufacturing machines largely replaced human power as the means of factory production in the period, however, it also “created new complementarities jobs between people and machines” (Autor 2015). For instance, the machines often require manual operations and configurations that are handled by human employees (Noble 1999, p. 172). In most cases, like the cotton and weaving industry in the 19th century, the use of machines increased the overall economic production (Bessen 2015b). Bessen notes further that although “an estimated 98% of the labor required to weave a yard of cloth” was automated, yet “consumer demand increased so sharply that the number of weaving jobs actually rose, and workers’ remaining tasks became increasingly valuable” (Bessen, 2015b).

Nichols and Beynon (1977) also apply this retrospective approach of technological changes in their AI study. They argue that as new technology emerges, the need to keep the machines running opens up substitute complimentary jobs for displaced human jobs. Both authors assert further that the use of large trucks to replace “donkey works”¹² for example, led to truck driving training and jobs (1977). In addition, the same reasoning was applied to the case of computer automation, which drastically reduced the number of routinely administrative employees like clerks, typewriter typists, and other similar jobs. However, it also led to new computer-related complimentary jobs and skills such as data analysts, computer engineers, computer graphic il-

lustrators – users of “modern scientific machines” (Walker 1958; Zuboff 1988). Thus, they conclude, “robotics and AI are simply the latest in a series of technological changes that are significant but not transformative” (Boyd and Holton 2017).

In other words, while AI automation “may create serious technological unemployment ... it does not represent a major new watershed in economic organization, nor a novel normative challenge to social life” (Boyd and Holton 2017). Furthermore, they believe the emergence of robots in the workplace would lead to new employment opportunities that would require interactions between humans and robots. As such, the aggregate economy and new complementary jobs will compensate some human workers whose job are replaced by robots. Eventually, the unemployment caused by AI automation will be minimal and less likely to have any significant socio-economic change in society.

While the above argument may have been largely plausible in the past, it fails to consider the degree in which AI evolution and automation transcends past technology and technological changes. Machines are getting increasingly better at performing various everyday human routine and non-routine tasks and operations (Katja et al. 2017). Currently, HLMI robots have been shown to competitively perform and sometimes outperform grandmasters in chess, and human experts in retailing (salesperson), manufacturing plants (on assembly lines, loading and unloading heavy goods), Math Research, GoFish, high school essay writing, etc. (Mlot 2018; Haridy 2017; Sherisse Pham 2018; Katja et al. 2017)¹³. In other cases, HLMI machines are also capable of engaging in deep emotional and sentimental interactions and reasoning with humans.¹⁴ Ford (2015) also notes that human capital will be unappealing to employers “if smart machines can perform all or most of their essential tasks better in the future.” Even more so, when it becomes more profitable for employers to use as many more machines as possible, and the least number of humans.

In addition, technology experts, including Bill Gates and Elon Musk, also argue that AI automation represents an unprecedented technological advancement.¹⁵ They add that, in general, it raises fundamental ethical, social, political, and economic concerns that need to be addressed sooner rather than later. Although the sophisticated level of AI today is far from being called a sudden technological revolution, nevertheless, no past technological changes have produced the intricacy currently associated with HLMI. As such, AI automation does represent an unprecedented technological change with yet unknown socio-economic and high unemployment consequences, which policymakers need to start taking seriously.

It is important to note here that one apparent solution to eliminate the high unemployment effects of AI automation will be to limit AI automation development. However, such drastic proposition will also eliminate the currently unknown, but promising benefits of AI in relevant fields such as health care, astronomy, economic productivity, and academic research. As such, restricting AI automation development may end up producing negative effects. In addition, perhaps, the main detrimental effect of restricting AI research and development is the likelihood that it may lead to a rebound effect. For example, we can theorize the outcome if AI development and research are restricted in the U.S. First, AI experts will be motivated to emigrate to countries, such as China, Japan, and a few other EU countries where AI development is permitted. Second, the U.S. will then fall behind in future

technological advancements due to the migration of many of its technology researchers to other major economic nations. Lastly, the explosion of AI development and AI automation around the world in the near future may eventually re-emerge in the U.S. Then, it follows from the above situation that the re-emergence of AI automation and its consequences in the U.S. appears inevitable, and the initial restriction was simply deterred, rather than eliminated. Thus, restricting AI research and AI development in order to deal with the current increasing unemployment effects of AI automation on human labor in the short-term or long-term seems like an ineffective policy response. Given this, it appears necessary to seek other policies that will effectively deal with the imminent negative effects of AI automation on human employment.

By relying on strong empirical sources, this paper so far has shown the following: the increasing use of AI automation will likely lead to a persistent high unemployment in the short-term; AI automation represents an unprecedented technological change because it differs from the automation experienced in the industrial revolution, and restricting AI development is not an effective policy response to deal with its imminent consequences over human labor. What follows focuses on why and how the unemployment effects of AI automation can be mitigated through UBI and UBAB policies.

Why Universal Basic Income and Universal Basic Adjustment Benefit?

In “Work in and beyond the Second Machine Age: the politics of production and digital technologies,” David Spencer (2016) argues that AI automation, if left unchecked or in the least approached with the right policy, will increase the current socio-economic inequality in society. For Spencer, the main concern is “who controls digital technology, robotics and AI-based intellectual property, and why political regulation of these areas is typically weak” (pg. 4). He argues, “most technology arises in situations of inequality and contributes to its reproduction” (pp. 4-6). Spencer also notes that “to the extent that AI technologies are used for the purposes of surplus value production, they will lead to outcomes that are favorable for capitalist employers and unfavorable for workers” (p. 8). He believes the elites who currently possess the wealth, connections, and resources to facilitate and finance various AI automation projects will most likely control and earn the larger share of AI economic rewards. Overall, Spencer implies that AI automation will lead to a higher unemployment that will increase the socio-economic inequality between displaced workers and those who control AI resources.

In “The Relentless Pace of Automation,” David Rotman (2017) uses AI automation data analysis to echo similar arguments as Spencer. Rotman highlights one of Uber’s AI experiment in which Uber “had one of its self-driving trucks make a beer run; traveling 200 kilometers down the interstate to deliver a cargo of Budweiser from Fort Collins to Colorado Springs.” Notable corporations such as Google, Audi, Volvo, Ford, Tesla, Bosch, Audi, Mercedes-Benz, Honda, etc., are also engaging in similar driverless car experiments, which indicates that AI automation is in line to most likely replace most driving jobs, which according to Derek Thompson¹⁶, provides “salary to most American men”¹⁷ (CBS/AP 2017).

Rotman (2017) also asserts that the jobs of workers in the

construction, retail, and manufacturing sectors are also at high risk of AI automation. To further support his arguments, Rotman provides graphical data to show that the U.S. government, compared to other well-to-do economic nations, lags behind in providing various welfare and work-related benefits to its citizens.¹⁸ Given these facts, and the gradual rise of unemployment due to the rapid rise of AI automation, Rotman asserts that it is highly likely that many workers will become “poorer” and also “left behind and left on [their] own.”¹⁹ Ultimately, Rotman believes a practical way to ensure socio-economic stability in the AI-age is to create policies that ensure everyone, especially displaced workers, will benefit from the gains of AI automation. In other words, the fruits of AI innovations and AI automation should be redistributed back into the society in ways that will, in the very least, benefit everyone in the society.

Universal Basic Income

Currently, UBI is the main well-supported socio-economic welfare policy that parallels Spencer and Rotman’s propositions. UBI policy promotes providing an “unconditional basic income to every citizen in the amount of the minimum standard of living, regardless of social or employment status” (Fajfar et al. 2014). UBI supporters argue that enacting a UBI policy will ensure that workers displaced by AI automation can easily step down from their jobs in the workforce without having to worry about how to secure their livelihood financially (Schneider 2017, p. 83).

In 2017, the state of Hawaii became the first state to successfully legislate a statewide UBI policy on a state level in the U.S. for AI automation and socio-economic inequality reasons (Owen and Pugh 2017). Representative Chris Lee, the author of the bill, asserts, “this is the first time a government” has come forward to “say that [it] values everybody in its state” and that Hawaii’s residents “deserve that right to UBI and a basic financial security” (Owen and Pugh 2017). He notes that though, there are a few manufacturing and technological sectors in Hawaii, AI automation has been gradually “disrupting” employments for Hawaiians in the state’s main economic sector – the “service sector,” which includes jobs such as hospitality, transportation, retail, etc. (Owen and Pugh 2017). In addition, Lee referenced a research article that notes that “since 1991 and 2007, as many as 6 [human] jobs in the nation are being replaced by each robot introduced into U.S. economy” (Owen and Pugh 2017). Based on their research, Representative Lee asserts that AI automation is highly likely to continue to disrupt human jobs in Hawaii in the near future, and that already high-income inequality in Hawaii may get worse (Owen and Pugh 2017).

Considering these factors, Representative Lee believes Hawaiians deserve UBI because the financial security will aid them “to be secure with their own family and the knowledge that, worse case – health issues, bankruptcy, business failing, economy crashing around them, and innovation wiping out jobs – there is something [UBI] for them” (Owen and Pugh 2017). Representative Lee adds that he “believes as an American, [the government] ought to have similar value for the entire country,” and as one of the wealthiest nations today, it will “uphold cultural and social value by setting up such framework for U.S. citizens” (Owen and Pugh 2017).

Similar to Hawaii, Y Combinator (LLC) in Oakland, California, provides \$1,500 monthly for a group of people selected ran-

domly to “study how recipients spend their time and how their financial health and well-being are affected” (CBS/AP 2017). In Finland, the government has embarked on an experiment to test whether UBI will generate new behaviors from citizens by giving €560 monthly to randomized groups of unemployed and employed Finnish people. The experiment is also being used as a way for the government of Finland to “adapt its social security system to a changing workplace, incentivize people to work and simplify the bureaucracy of benefits” (CBS/AP 2017). The program is will run from January 2017 to December 2018, after which, the results of the experiment will be released (Schulze 2018).

Alaska also pays its residents about \$1,000 to \$2,000 annually from its oil extraction revenue. Only 1 percent of recipients said that “receiving the oil dividend had made them likely to work less” (CBS/AP 2017). Likewise, the province of Ontario in Canada launched its UBI experiment, “Ontario’s Basic Income Pilot,” to study “whether a basic income can better support vulnerable workers, improve health and education outcomes for people on low incomes, and help ensure that everyone shares in Ontario’s economic growth” (Ministry of Community and Social Services, 2018). The program, which will randomly select 4,000 residents of Brantford, Brant County, Lindsay, Thunder Bay and the surrounding area, was launched in November of 2017 and it is currently in its registration stage (Ministry of Community and Social Services, 2018).

In spite of the above strong evidence noted above about the continuous progression of AI automation, skeptics of UBI often argue that implementing UBI will eliminate the incentive to seek employment (Owen and Pugh 2017). While this position is conceivable, it is, nevertheless, fast becoming quickly unappealing in that employers are now increasingly dependent on AI automation, and less on high numbers of human employees to increase the efficiency of their products and profits (Rotman 2017). In addition, as the new UBI law in Hawaii and the small-scale experiment in the other cities mentioned above imply, more employees will be laid-off their current jobs with a little expectation of finding new jobs as AI automation progresses. This will be exemplified as machines continue to improve and outperform humans in most given tasks and labors (as shown by Rotman 2017; Mlot 2018; Haridy 2017; Sherisse Pham 2018; Katja et al. 2017). Thus, it seems practical to expect more U.S. policymakers to start engaging in meaningful debates about this gradual but increasing high unemployment threat of AI automation. Policymakers also need to emulate Hawaii by creating some UBI-oriented policies that will provide a financial safety net for human workers in this transitory period.

Universal Basic Adjustment Benefit

In addition to UBI, the UBAB, proposed by Mark Muro²⁰ (2017), is another potential and plausible policy proposal that policymakers can use to deal with the high unemployment effects of AI automation in the short-term (2017). UBAB differs from UBI in that it does not call for a universal basic income for everyone. Instead, it mainly proposes a federal financial security and training framework for AI automation displaced workers as they look for new and stable jobs. With UBAB, displaced workers have access to basic financial assistance while unemployed, and can also receive the necessary training needed to remain employable in the changing AI automation market.

In arguing for UBAB, Muro first shows that the effort of the U.S. in providing adjustment benefits to workers in and out of the labor market during technological and economic changes is significantly low compared to countries such as France, Germany, Korea, Canada, and Japan. He points out that according to a 2014 GDP analysis (based on percent) on government spending on programs to help workers with economic transitions, the U.S. spends the considerably lower amount of 0.11%, as compared to Japan; 0.22%, Canada; 0.22%, Korea; 0.45, Germany; 0.66, and France; 0.99%.²¹ Muro argues, the most alarming concern about the U.S. current economic approach to the labor force is that the programs provide “help only after the fact—and in increasingly old-school circumstances.” For example, “tuition, counseling, and training are usually made available only after a plant has closed or workers have been laid off.” Further, the existing programs focus on outdated manufacturing plants “when much broader sources of labor market disruption are now resulting from game-changing technologies (like robotics and automation) or disruptive business models (such as those powered by online digital platforms for freelance worker matching).”

In addition, Muro adds that “the available programs do not reflect recent thinking that suggests that government should do more to help people who want to physically move to areas with more jobs and opportunity.” He also argues that the government needs to be “pro-active” in understanding the trends of economic and technological development to better anticipate and create programs that will benefit workers displaced by AI automation. Muro summarizes UBAB as a way of:

rethinking economic model that create a single, holistic, multipurpose, adjustment benefit—a sort of basic transition offering—that might bundle together a core set of broadly relevant tools: job-search counseling, including opportunities in promising remote locations; sizable cash grants for training; sizable relocation grants; and wage insurance (2017).

Muro’s emphasis on the fact that the current inadequacy of the government to effectively respond to the economic changes of technological changes and unemployment further shows that, overall, policymakers are not yet taking the debate of AI automation seriously. Moreover, Owen and Pugh (2017) explain that interest in UBI (and other welfare social policies in general like UBAB) is expanding among economic researchers, and that it is no longer an obscure welfare framework – even among the U.S. general populace. The growing popularity of UBI, as shown in previous pages, implies that UBI can be implemented now – independently or together with UBAB – on a local level to first test their efficiency and effects on local economy, revenues, standard of life of local residents, and the workforce. If such policies prove effective locally in the aforementioned areas, then they should also be integrated as state and federal policies.

Conclusion

This paper has shown that the skeptical view that AI automation warrants no immediate debate or any universal basic income policy measures for displaced workers does not suffice as a significant reason to suspend the debate of AI automation. In fact, discussing these implications with needed alternative solutions

is more relevant now because potential corporations are relying more on AI automation and less on human workers to meet their consumers’ increasing demand. Thus, neglecting this discourse simply because robots are not yet walking on our streets in mass, teaching in schools, or fully running manufacturing plants across the country, may prove detrimental in the near future. Moreover, the sooner the AI and AI automation trend can be anticipated, policymakers can better mitigate the aggregate consequences of full AI and AI automation in society. Thus, as argued in this paper, UBI and UBAB are distinct frameworks that policymakers can implement to start responding to the gradually increasing negative effects of AI automation of human labor in the workforce.

Appendix

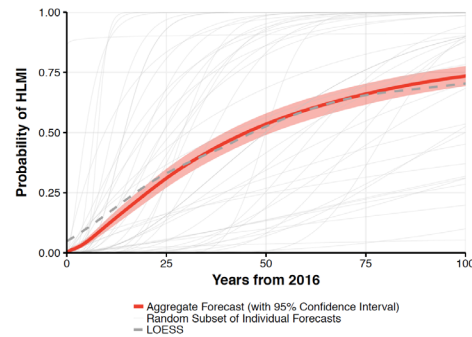


Figure 1: Aggregate subjective probability of ‘high-level machine intelligence’ arrival by future years. Each respondent provided three data points for their forecast and these were fit to the Gamma CDF by least squares to produce the grey CDFs. The “Aggregate Forecast” is the mean distribution over all individual CDFs (also called the “mixture” distribution). The confidence interval was generated by bootstrapping (clustering on respondents) and plotting the 95% interval for estimated probabilities at each year. The LOESS curve is a non-parametric regression on all data points.

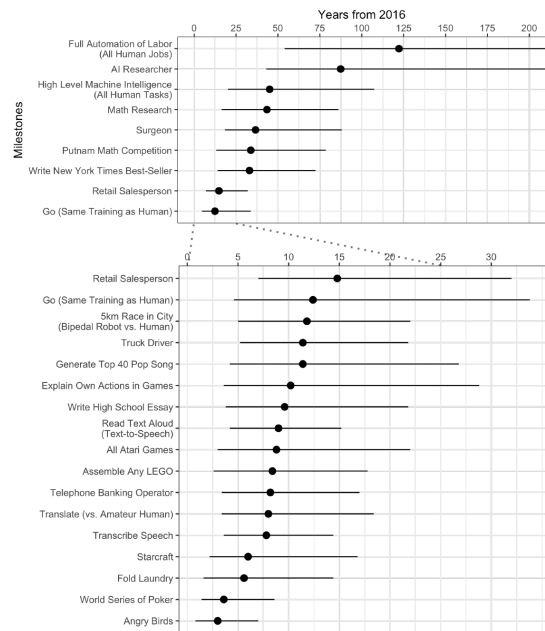


Figure 2: Timeline of Median Estimates (with 50% intervals) for AI Achieving Human Performance. Timelines showing 50% probability intervals for achieving selected AI milestones. Specifically, intervals represent the date ranges from the 25% to 75% probability of the event occurring, calculated from the mean of individual CDFs as in Fig. 1. Circles denote the 50%-probability year. Each milestone is for AI to achieve or surpass human expert/professional performance (full descriptions in Table S5). Note that these intervals represent the uncertainty of survey respondents, not estimation uncertainty.

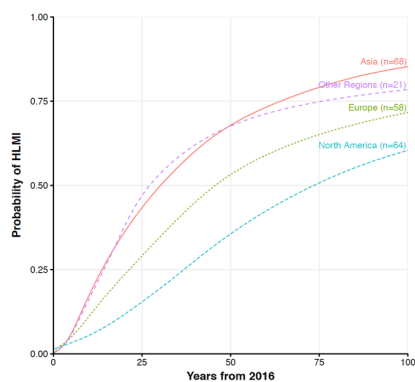
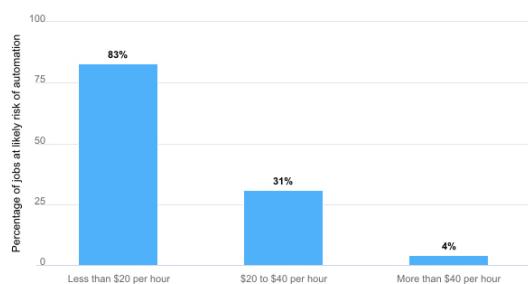


Figure 3: Aggregate Forecast (computed as in Figure 1) for HLMI, grouped by region in which respondent was an undergraduate. Additional regions (Middle East, S. America, Africa, Oceania) had much smaller numbers and are grouped as "Other Regions."

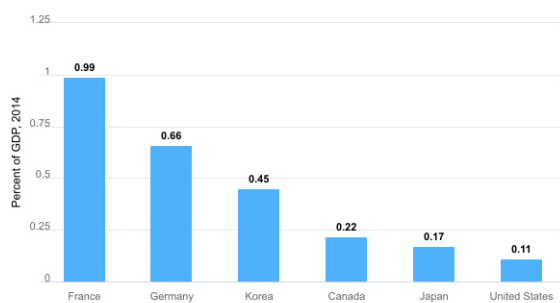
The Poor Get Poorer

Low-paying jobs are particularly vulnerable.

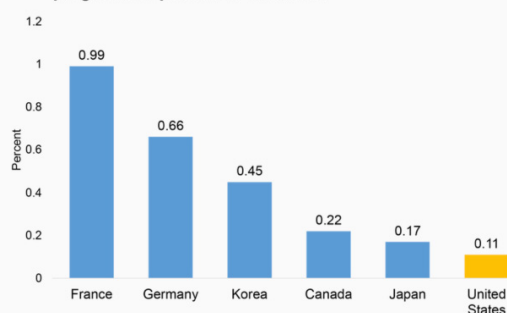


On Your Own

The U.S. government lags in spending on programs to help workers with economic transitions



Spending on active labor market adjustment programs as percent of GDP, 2014



Source: Public expenditure as a percentage of GDP, OECD 2016

Metropolitan Policy Program
at BROOKINGS

Notes

1 This term was used by Katja et al. (2017). The authors note that "HLMI is achieved when unaided machines can accomplish every task better and more cheaply than human workers."

2 The use of policymakers in this paper includes legislators such as Representatives, Senators, academic and corporate world experts etc. on policy formulations.

3 See Vincent Conitzer, "Today's Artificial Intelligence Does Not Justify Basic Income," MIT Technology Review, www.technologyreview.com/s/602747/todays-artificial-intelligence-does-not-justify-basic-income/ (accessed February 13, 2017).

4 Conitzer is a professor of computer science, economics, and philosophy at Duke University

5 English Oxford Living Dictionaries online defines AI as "The theory and development of computer systems able to perform tasks that normally require human intelligence, such as visual perception, speech recognition, decision-making, and translation between languages."

6 The use of AI automation in this paper specifically refers to the introduction, dependence, and use of robots and all forms of computer assisted and operated machines as a means of efficient production in the workforce.

7 "HLMI is achieved when unaided machines can accomplish every task better and more cheaply than human workers." Katja et al. 2017. p. 1.

8 The use of short term in this paper covers the timeline between now and the next 100 years

9 Refer to Figure 2 of the Appendix for visual analysis which includes tables and graphs.

10 According to the "current employment statistics survey" carried out by the U.S. Bureau of Labor Statistic, about half or more of U.S. job sectors consists of jobs in the transportation, retail and wholesale trade, utilities, transportation and warehousing.

11 For a lucid assessment on this view, see Benjamin Shestakofsky 2017

12 Donkey works refers to the use of donkeys and oxen to work on farm and also transport farm produces. For more in depth reading on animal use in agriculture and transport, see R. Anne Pearson 2013.

13 For a detailed list of these activities and visual analysis, see Figure 2 of the Appendix.

14 See Dr. David Hanson, CEO of Hanson Robotics, interview with Sofia, a humanoid, www.youtube.com/watch?v=W0_DPi0PmF0 (assessed February 24, 2018).

15 Bill Gates, the principal founder of the Microsoft Corporation, and Elon Musk, CEO of the SpaceX, Space Exploration Technologies Corp., American aerospace manufacturer and space transport services company, live interview conducted by Robin Li, Baidu CEO, https://www.youtube.com/watch?v=0pz_XDC8Yq, (assessed February 24, 2018).

16 Senior Editor for The Atlantic

17 Thompson aggregates cab driving jobs to include lim-

ousine drivers and other over 1.5 million drivers signed up with Uber (CBS/AP 2017).

18 Refer to Figure 4 of the Appendix for a visual bar graph.

19 Refer to Figure 5 of the Appendix for a visual bar graph.

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21 See Figure 6 of the Appendix for visual bar graph. See also (Rotman 2017) for further analysis on this point.

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Sport Specialization and Physical and Psychosocial Health Outcomes of College Students

by Shelby Waldron

This retrospective study examined the association between sport specialization and both retrospective and current psychosocial (i.e. burnout, perceived sport stress, athlete engagement, self-determined sport motivation, and intrinsic motivation towards exercise) and physical (i.e. injury risk) health outcomes. Data was collected from 150 college-aged individuals (ages 18-23), who participated in at least one full season of competitive sport in high school. Participants completed a self-report online survey, utilizing valid and reliable psychometric scales. Minimal significant group differences were found. However, highly specialized athletes reported significantly lower levels of reduced sense of accomplishment and higher levels of integrated motivation, when compared to moderate and low specializers, respectively. Additionally, significant group differences were found in regards to athletes' reasons for specialization, with adaptive reasons associated with adaptive psychosocial outcomes. Together, findings suggest that the specialization environment may not be inherently maladaptive in regards to psychosocial outcomes, but dependent on athletes' experiences and perceptions of sport-commitment and motivation factors. Further research examining mediating factors and the unique effects of early specialization is warranted.

Keywords: athletic injury, burnout, specialization, psychosocial health and well-being

Introduction

Sports play an influential role in many American youth's lives, with approximately 60 million kids, ages 6 to 18, participating in organized athletics, in the U.S. (DiFiori, Benjamin, Brenner, & Grego, 2014). Sport participation has been proposed to provide multiple benefits for youth, including: enjoyment, socialization with peers, development of teamwork and leadership skills, enhancement of self-esteem, and development of lifetime physical activity skills (Brenner, 2016). However, sport participation also carries potential negative psychological (i.e. burnout and drop-out) and physical risks (i.e. acute and chronic injury) (DiFiori et al., 2014; Sabiston et al., 2016). One potential antecedent of these maladaptive outcomes is sport specialization, high intensity, year-round training in a single sport, with the exclusion of other sports (Wiersma, 2000). This topic has produced

intensive debate regarding the potential benefits and risks of sport specialization for youth (Baker, Cobley, & Fraser-Thomas, 2009; Wiersma, 2000).

The debate concerning sports specialization is centred around two main issues, whether specialization is necessary to facilitate elite performance and/or whether it increases the risk of maladaptive outcomes, both physical and psychological (Reider, 2017). Specialization is often favoured by coaches, parents, and youth sport organizations, as it is believed to be a necessity to achieve elite level performance in sports, in part due to Ericsson, Krampe, and Tesch-Romer's (1993) "10,000 hour rule." Based on findings in expert musicians, researchers have argued that the acquisition, development, and proficiency of sport-specific motor skills requires 10,000 hours of deliberate practice, coinciding with critical periods of development (i.e. early childhood, beginning around age five) (Ericsson et al., 1993). However, anecdotal evidence

from elite athletes suggests only 3,000 to 4,000 hours of deliberate practice (effortful activities that are not inherently enjoyable, but designed to develop sport-specific skills) are necessary (Baker et al. 2009). Both at the collegiate and international level, elite athletes accumulated almost double the amount of training in other sports, compared to their non-elite peers. In addition, elite athletes were more likely to specialize and achieve career “milestones” (i.e. starting sport and participation in first competition) at a later age (Brenner, 2016; Gullich & Emrich, 2014; Malina, 2010; Moesch, Elbe, Hauge, & Wikman, 2011). Together, these findings suggest that specialization is not the sole pathway to achieving elite level performance, and diversification or sampling may offer additional performance benefits. Furthermore, alternative pathways to elite status may optimize affective, physical, and social development (Cote, Lidor, & Hackfort, 2009). Cote, Baker, and Abernathy’s (2007) Developmental Model of Sport Participation, suggests there are two distinct pathways to elite performance, sampling or early specialization (Cote, Horton, MacDonald, & Wilkes, 2009). Sampling refers to participation in multiple sports with high levels of deliberate play (inherently enjoyable activities, often involving adapted rules and loose monitoring by adults), and low levels of deliberate practice. In contrast, specialization is characterized by low levels of deliberate play, high levels of deliberate practice, and a focus on a single sport. Of special concern to sport scientists is “early specialization” or specialization between the ages of six and twelve (also known as the sampling years), due to rapidly occurring emotional, social, and motor development (Cote, Horton et al., 2009; Wiersma, 2000). Guided by Cote et al.’s (2007) model, the costs and benefits of each pathway to sport development should be weighed, as researchers have proposed maladaptive associations between sport specialization and health outcomes, such as injury (physical) and burnout (psychological) (DiFiori et al., 2014).

Athlete burnout is the multidimensional psychological syndrome of reduced sense of athletic accomplishment, sport devaluation, and physical and emotional exhaustion (Raedeke, 1997). Smith’s (1986) cognitive-affective model suggests burnout results from chronic psychosocial stress, a perceived disparity between sport demands and coping resources. Burnout may also result from the development of a unidimensional identity and lack of autonomy, inherent in the social organization of high performance sport (Coakley, 1992). While burnout has been linked to factors commonly associated with sport specialization, such as decreased autonomy in training programs and competing at high levels, there is limited extant research on the direct relationship between specialization and burnout (Gould, Udry, Tuffey, & Loehr, 1996). Strachan, Cote, and Deakin (2009) found that youth athletes classified as “specializers” reported higher levels of the burnout dimension emotional exhaustion, versus those classified as “samplers.” However, other specialization studies on related psychological health outcomes have shown mixed results, with specialization associated with both higher psychological needs dissatisfaction (maladaptive outcome) and intrinsic motivation to know (adaptive outcome; McFadden, Bean, Fortier, & Post, 2016; Russell & Symonds, 2015).

Though somewhat limited in scope, the aforementioned extant findings suggest that the specialization environment may not be inherently psychologically maladaptive. Instead, the direction and magnitude of the specialization-psychosocial health relation-

ship may be dependent on athletes’ perceptions of sport-commitment (i.e. costs, benefits, and alternatives) and motivation (i.e. autonomy, control, and relatedness) factors (Russell & Symonds, 2015). In their self-determination theory, Ryan and Deci (2000) argue that psychological and behavioural outcomes, such as burnout, are impacted by the nature of one’s motivation (i.e. the degree of self-determination). Similarly, Schmidt and Stein’s (1991) sport commitment theory suggests that sport enjoyment, burnout, and attrition can be explained by an individual’s cost-benefit analysis of his/her perceived rewards, satisfaction, costs, investments, and attractive alternatives. Supporting the aforementioned theories, Raedeke (1997) found that athletes experiencing entrapment (perceived need to continue sport participation, despite lack of enjoyment) reported higher levels of burnout than those with more adaptive commitment profiles. Therefore, athletes’ reasons for specialization may play a key mediating role in determining specializers’ psychosocial outcomes. Future research is needed to further understand the association of sport specialization and athlete psychological outcomes, such as burnout.

Research on burnout is further warranted due to the posited positive relationship between injury and burnout, with more injuries associated with higher burnout scores, specifically in the dimension of reduced sense of sport accomplishment (Hughes, 2014; Grylls & Spittle, 2008). However, currently injured athletes have also reported lower global burnout scores versus their uninjured teammates, especially on the dimension of exhaustion, as injury may provide a break from intensive sport involvement (Grylls & Spittle, 2008). In addition to the potential link with burnout, specialization carries its own risk of athletic injury, especially overuse injury, due to: high training volumes, year-round exposure, repetitive physiological stress, higher competitive demands, higher level competition, decreased age-appropriate unstructured free play, and early development of technical skills (Jayanthi, Pinkham, Dugas, Patrick, & LaBella, 2013; Loud, Gordon, Micheli, & Field, 2005; Myer et al., 2015; Post et al., 2017). Past studies have supported a positive, dose-dependent relationship between specialization and overuse injuries, even when controlling for age, sex, and weekly training volume. However, findings have been mixed in regards to acute injury, with both positive associations with specialization and lack of significant differences between specializers and samplers (Hall, Barber, Hewett, & Myer, 2015; Jayanthi, Dechert, Durazo, Dugas, & Luke, 2011; Jayanthi, LaBella, Fischer, Pasulka, & Dugas, 2015; Post et al., 2017). The importance of examining sport specialization’s relationship with health outcomes is evident in the growing number of position statements from major medical organizations, such as the International Federation of Sports Medicine, World Health Organization, and American Academy of Pediatrics, warning against early specialization (Wiersma, 2000). In addition, there are an increasing number of elite youth sport competitions, such as the Junior Olympics and the AAU. A better understanding of the costs and benefits of sport specialization could aid in the development of recommendations, guidelines, and interventions to help clinicians prevent and treat maladaptive psychological outcomes and overuse injuries, educate parents, athletes, and coaches, and inform sport governing bodies’ policies (Wiersma, 2000; Jayanthi & Dugas, 2017).

Despite the growing interest in specialization and practical implications of specialization research, very little data has been

collected to support prominent claims, especially in regards to psychological health outcomes. Extant research is limited, focuses on short-term physical effects (i.e. current injuries) of specialization in youth athletes, and often utilizes a clinical sample (i.e. athletes who are presenting to a hospital/sports medicine clinic with injuries). Retrospective assessment of both short-term effects of specialization in adolescence and more long-term effects in early adulthood, serves as a first step in bridging the current gaps in knowledge and informing future prospective work. Therefore, this study examined the relationship between young adults' retrospective sport specialization and both past and present psychological (i.e. burnout, motivation, engagement, perceived sport stress, and resilience), and physical (i.e. injury risk) health, utilizing a retrospective design. Based on theory and past empirical findings, the primary research hypothesis is that there will be a positive relationship between specialization and maladaptive health outcomes. Highly specialized athletes will report the highest levels of maladaptive physical (i.e. risk of injury) and psychological (i.e. burnout and perceived sport stress) health outcomes, and the lowest levels of adaptive psychological (i.e. athlete engagement, self-determined sport motivation, intrinsic motivation towards exercise, and psychological resilience) outcomes. Finally, an exploratory hypothesis will examine if there are differences in psychological outcomes based on individuals' reasons for specializations.

Methods

Participants

Data was collected from a convenience sample of one-hundred and fifty college aged individuals (ages 18-23; $M = 20.23$, $SD = 1.34$). All participants participated in at least one season of competitive sport in high school, with a maximum of thirty-four seasons ($M = 9.79$, $SD = 5.86$). Demographics, including age, gender, race, and current sport participation were collected. The majority of participants self-identified as female (68.0%, $n = 102$), with the remaining identifying as male (26.7%, $n = 40$) or not specified (5.3%, $n = 8$). Most participants self-identified as Caucasian (76.0%, $n = 144$), with others self-identifying as Black/African American (8.7%, $n = 13$), Asian (5.3%, $n = 8$), more than one race (2.0%, $n = 3$), American Indian/Alaskan Native (1.3%, $n = 2$), other (7.0%, $n = 1$), or non-specified (6%, $n = 2$). In addition, the majority of participants self-identified as non-Hispanic (88.7%, $n = 133$; 8 cases non-specified). Slightly over half of the participants still play a sport (51.4%, $n = 73$; 8 cases non-specified) at either a recreational (38.4%, $n = 28$), club (32.9%, $n = 24$), or varsity level (28.8%, $n = 21$). Participants reported involvement in their respective sports for an average of 9.12 years ($SD = 5.17$).

Procedure

Following ethical approval from an institutional review board, participants were recruited via social media, flyers, mass emails, in-person announcements at a south eastern university, and a database of previous research participants. Using the link provided on the flyer or sent in an email, participants filled out a confidential, online Qualtrics survey on their own devices, at their convenience. The survey included self-reported demographics and sport participation and measures of both retroactive and current physical and psychosocial health.

Measures

Demographics

Participants were asked to self-report their age, gender, ethnicity, race, school, current sport participation level, and years playing their current sport, if applicable.

Retrospective

Participants were asked to self-report their American high school sport participation, including the degree of specialization. Self-reported retrospective perceptions of high school sport burnout, athlete engagement, sport motivation, sport-related stress, and past injury history, were also utilized. Participants were primed via a two-minute reflection of their final season of high school sport before beginning the assessment, in order to increase the reliability of retrospective responses (Mosewich, Crocker, Kowalski, & DeLongis, 2013; Reis et al., 2015). All retrospective questions were in reference to the participant's final high school sport season.

Sport Specialization. Sport specialization was measured using Jayanthi et al.'s (2015) 3-point scale, based on the definition of specialization as year-round intensive training in a single sport, at the exclusion of other sports. Participants responded to three questions, "Did you quit other sports to focus on one sport?", "Did you train more than eight months out of the year in a single sport?", and "Did you consider your primary sport more important than other sports?" A response of "yes" was coded as a one, and "no" was coded as zero. If the sum of the three questions was three, participants were classified as a high specializer, moderate for a score of two, and low for a score of zero or one. Early specialization was classified as a response of twelve or less to the question "At what age did you quit other sports to focus on one sport?" based on Cote et al.'s (2007) Developmental Model of Sport Participation. Participants who specialized in one sport, also self-reported their reason for specialization via selecting all responses that apply from the choices: "time demands", "pursuit of athletic excellence", "personal enjoyment", "coach/parent pressure", "injury", "financial reasons", and "other."

Athlete Burnout. Global burnout was measured using Raedeke and Smith's (2001) fifteen item Athlete Burnout Questionnaire (ABQ). The ABQ assesses participants' self-reported perceptions utilizing five point Likert scales, ranging from 1 (Almost Never) to 5 (Almost Always). The items address three dimensions of burnout, reduced sense of accomplishment, emotional and physical exhaustion, and sport devaluation, with five items per dimension. A global burnout score was computed by averaging the three subscales, with a range from one to five. The ABQ has been shown to be reliable and have good construct validity (Raedeke & Smith, 2001). Internal consistency reliability of scores in the current study was $\alpha = .92$.

Engagement. Athlete engagement was measured using Lonsdale, Hodge, and Jackson's (2007) sixteen item Athlete Engagement Questionnaire (AEQ). Participants utilized a five-point Likert scale, ranging from 1 (Almost Never) to 5 (Almost Always), to indicate how often they felt a certain way during their final high school sport season. For example, participants report-

ed how often they felt that they “believed they were capable of accomplishing their goals in sport.” A global athlete engagement score was calculated by averaging the scores on all sixteen items. The AEQ was shown to have factorial and nomological validity, utilizing a sample of elite athletes from New Zealand and Canada (Lonsdale et al., 2007; Study 2 and 3). Internal consistency reliability of scores in the current study was $\alpha = .97$.

Self-Determined Motivation. Motivation was measured using Lonsdale, Hodge, and Rose’s (2008) Behavioral Regulation in Sport Questionnaire (BRSQ), based on Ryan and Deci’s (2000) self-determination theory (SDT). The twenty-four item BSQ contains six subscales measuring intrinsic motivation, autonomous extrinsic motivation (integrated and identified regulation), controlled motivation (external and introjected motivation), and amotivation. Participants responded to the item stem “I participated in my sport...” utilizing a seven-point Likert scale for each motivation subscale, ranging from 1 (Not at all True) to 7 (Very True). The BRSQ was designed specifically for use with competitive sport participants, demonstrating both reliability and validity in elite and non-elite athlete populations (Lonsdale et al., 2008). All subscales in the current study demonstrated internal consistency reliability ($\alpha > .07$).

Sport-Related Stress. Sport-related stress was measured using the four-item, short version of Cohen, Kamarch, and Mermelstein’s (1983) Perceived Stress Scale (PSS-4). The PSS is a global measure of stress, examining how unpredictable, uncontrollable, and overloaded participants feel their lives are. In this study, participants rated how often they experienced stressful situations in their final high school sport season on a five-point Likert scale, ranging from 1 (Never) to 5 (Very Often). The PSS-4 has been found to be both reliable and valid, and is suitable for short assessments (Cohen & Williamson, 1988). Internal consistency reliability of scores in the current study was $\alpha = .76$.

Past Injury History. Past injury history was measured using participants’ self-reported number of total sports-related injuries and the mechanism of injury for each of the participant’s three most severe (in terms of participation days missed) injuries, as applicable. Mechanism of injury was classified as “overuse,” “contact,” “non-contact,” or “other.” The questions chosen were based on findings from previous studies (Hughes, 2014; Jayanthi et al., 2013; Post et al., 2017).

Current

Participants were asked to self-report their current intrinsic motivation and psychological resilience.

Intrinsic Motivation. Intrinsic motivation towards physical activity/exercise was measured using the (1982) Intrinsic Motivation Inventory (IMI) (SDT, n.d.). The IMI is a multidimensional questionnaire based on Self-Determination Theory and designed to assess participants’ motivation when performing a specific activity. Research has demonstrated that the inclusion or exclusion of any one of the seven subscales does not affect the remaining dimensions (McAuley, Duncan, & Tammen, 1989). Therefore, this study utilized the five questions from the interest/enjoyment subscale, the IMI’s only direct self-report measure of intrinsic motivation, to measure intrinsic motivation regarding physical

activity, including sport activity and/or exercising. Participants indicated how strongly they agreed with a statement regarding their physical activity habits on a seven-point Likert scale, ranging from 1 (Strongly disagree) to 7 (Strongly agree), with question two reverse scored. Internal consistency reliability of scores in the current study was $\alpha = .91$.

Psychological Resilience. Psychological resilience was measured using a ten-item short version of the Connor-Davidson Resilience Scale (CD-RISC; Connor & Davidson, 2003). The CD-RISC is used to measure the resilient qualities of hardiness and persistence, or an individual’s ability to tolerate and bounce back from challenges in life (Campbell-Sills & Stein, 2007). Participants rated how much they related to an item in the past month utilizing a five-point Likert scale ranging from 1 (Not at all True) to 5 (True Nearly all the Time). If the situation had not occurred recently, participants were instructed to indicate how they would normally respond. The average of the ten items was used to determine an overall resiliency score. Internal consistency reliability of scores in the current study was $\alpha = .90$.

Data Analysis

All data analysis was performed using IBM SPSS Statistics, Version 24 (IBM Corp., 2016) and an a priori significance value of $p < .05$. The first phase of data analyses involved preliminary data screening for missing values, outliers, and violations of assumptions of multivariate analysis, following Tabachnick and Fidell’s (2007) procedures. All assumptions of multivariate analysis were met. Therefore, descriptive statistics, bivariate correlations, regressions, and tests for group differences (chi-square and ANOVA) were conducted in order to assess the research hypothesis of interest.

Results

Preliminary Data Screening

No violations of the assumptions of multivariate analysis were found when examining skewness and kurtosis values, and pairwise scatterplots. Data was missing on intrinsic motivation for one case (0.67%), and psychological resilience for eight cases (5.0%). Since missing data did not exceed five percent for any variable, the few missing scores were mean imputed and the following analyses were run using the full 150 cases for all variables.

Descriptive Statistics

Descriptive statistics are presented in Table 1. Overall, participants reported low-to-moderate levels of global athlete burnout and its dimensions of emotional and physical exhaustion, reduced accomplishment, and sport devaluation. A majority of the sample experienced a sports-related injury during their athletic career ($n = 115, 76.7\%$). However, past injury rate was only significantly associated with the burnout dimension of sport devaluation, not global burnout. Bivariate correlations among study variables were statistically significant and of expected magnitude and direction, with significant associations between specialization factors (i.e. weekly training volume and total seasons of sport) and both physical (i.e. past injury rate) and psychological (i.e. burnout) health outcomes. Specifically, athletes who reported higher hours of sport-related training per week also reported higher numbers of previous sport-related injuries. Whereas, athletes who reported a higher total number of seasons of sport participation, reported lower levels of the burnout dimension of reduced sense of accomplishment.

Table 1: Descriptive Statistics for Study Variables

Table 1. Descriptive Statistics for Study Variables (N = 150)

Variable	1	2	3	4	5	6	7
1. Burnout	--						
2. Red Acc	.81**	--					
3. Exhaustion	.79**	.39**	--				
4. Spt Dev	.90**	.63**	.61**	--			
5. Previous Injury	.15	.00	.18	.20*	--		
6. Total Seasons	-.11	-.16*	-.01	-.10	.18	--	
7. Train Hrs	-.06	-.12	.11	-.13	.22*	.19*	--
M	2.34	2.29	2.53	2.21	2.70	9.79	13.69
SD	.70	.84	.81	.87	1.89	5.86	6.98

Note: Correlations appear below the diagonal. Red Acc = reduced accomplishment, Spt Dev = sport devaluation, Total Seasons = total number of seasons of high school sport, Train Hrs = weekly training hours, M = mean, SD = standard deviation. Bolded r values are significant (p < .05). * p < .05, ** p < .01.

Specialization Group Differences in Health Outcomes

Chi-square tests and ANOVAs were run to test for between group differences among low, moderate, and high specializers on a variety of outcome variables. In line with previous literature (Bell et al., 2016), there was an almost equal split amongst the sample in terms of specialization classification: low (n = 46, 30.7%), moderate (n = 60, 40.0%), and high (n = 44, 29.3%). Significant specialization group differences were found for reduced accomplishment (a dimension of athlete burnout) and integrated motivation. Highly specialized athletes reported significantly lower average levels of reduced accomplishment compared to the moderate specialization group, F (2, 147) = 3.12, p < .05, 2 = .04. In addition, highly specialized athletes reported significantly higher average levels of integrated motivation compared to the low/non-specialized group, F (2, 147) = 4.33, p < .05, 2 = .06.

Independent sample t-tests were run to determine group differences, based on a binary response of “yes” or “no,” for each specific reason for specialization, out of the sample of participants who specialized in a single sport (n = 65). When given the chance to select as many reasons as applicable in regards to the reason for specialization, the majority of participants selected time demands (n = 40, 61.5%) and/or the pursuit of athletic excellence (n = 34, 52.3%). The other cited reasons included personal enjoyment (n = 28, 43.1%), coach/parent pressure (n = 10, 15.4%), injury (n = 11, 16.9%), financial reasons (n = 3, 4.6%), and other (n = 3, 4.6%). Significant group differences were found between athletes who selected athletic excellence as a reason for specialization (n = 34, 52.3%), and those who did not (n = 31, 47.7%), and the same for time demands (n = 40, 61.5% and n = 25, 38.5%, respectively). Athletes who cited the pursuit of athletic excellence as a reason for specialization had decreased mean levels of reduced accomplishment and sport stress, and increased athlete engagement, current intrinsic motivation for exercise, and psychological resilience, compared to other specializers.

Table 2: Descriptive Statistics for Specialization Groups

Table 2. Descriptive Statistics for Specialization Groups (N = 150)

	Low Specialization		Moderate Specialization		High Specialization		F
	M	SD	M	SD	M	SD	
Burnout	2.39	.77	2.40	.61	2.21	.74	1.07
Red Acc	2.37	.87	2.42	.80	2.03	.81	3.12*
Exhaustion	2.54	.81	2.57	.80	2.47	.84	.21
Spt Dev	2.27	.95	2.21	.77	2.14	.93	.23
AEQ	3.94	.72	3.97	.74	4.25	.75	2.47
Sport Stress	2.50	.81	2.56	.71	2.25	.81	2.24
Pr Injury	2.47	1.38	2.65	1.65	2.94	2.46	.54
Intrinsic	5.93	1.09	5.94	1.20	6.09	1.13	.26
Integrated	4.54	1.74	5.12	1.35	5.42	1.26	4.33*
Identified	5.08	1.26	5.42	1.09	5.52	1.00	2.01
Introjected	3.68	1.72	4.32	1.61	4.15	1.83	1.85
External	3.03	1.77	3.03	1.53	3.19	1.75	.14
Amotivation	2.70	1.55	2.75	1.61	2.72	1.65	.01
IMI	5.67	1.31	5.59	1.00	5.84	1.04	.62
Resilience	3.80	.66	3.80	.61	4.03	.62	2.09

Note: Red Acc = reduced accomplishment, Spt Dev = sport devaluation, Pr Injury = previous sport-related injury, IMI = intrinsic motivation towards physical activity/exercise, M = mean, SD = standard deviation. Bolded F values are significant (p < .05). * p < .05, ** p < .01.

In contrast, those who cited time demands demonstrated higher levels of sport devaluation and global athlete burnout, and decreased athlete engagement and intrinsic motivation, compared to other specializers.

Table 3. Independent Sample t-test for Athletic Excellence (N = 65)

	Selected		Did Not Select		t-test
	M	SD	M	SD	
Burnout	2.20	.60	2.53	.84	1.80
Red Acc	1.94	.65	2.53	.91	3.01*
Exhaustion	2.59	.85	2.57	.94	-.09
Spt Dev	2.08	.74	2.49	.99	1.90
AEQ	4.38	.46	3.82	.86	-3.27*
Sport Stress	2.15	.64	2.64	.95	2.45*
IM	6.07	.93	5.77	1.39	-1.00
IMI	6.12	.76	5.22	1.15	-3.77**
Resilience	4.12	.50	3.78	.60	-2.42*

Note: M = mean, SD = standard deviation, Red Acc = reduced accomplishment, Spt Dev = sport devaluation, AEQ = athlete engagement, IM = retrospective intrinsic motivation, IMI = current intrinsic motivation to exercise. Bolded t values are significant ($p < .05$). * $p < .05$, ** $p < .01$.

Table 4. Independent Sample t-test for Time Demands (N = 65)

	Selected		Did Not Select		t-test
	M	SD	M	SD	
Burnout	2.51	.77	2.11	.62	-2.17*
Red Acc	2.36	.88	2.0	.71	-1.72
Exhaustion	2.71	.90	2.37	.84	-1.52
Spt Dev	2.47	.89	1.98	.80	-2.24*
AEQ	3.96	.79	4.37	.56	2.25*
Sport Stress	2.51	.85	2.17	.79	-1.63
IM	5.69	1.28	6.30	.89	2.08*
IMI	5.54	1.05	5.94	1.06	1.53
Resilience	3.90	.47	4.07	.72	1.15

Note: M = mean, SD = standard deviation, Red Acc = reduced accomplishment, Spt Dev = sport devaluation, AEQ = athlete engagement, IM = retrospective intrinsic motivation, IMI = current intrinsic motivation to exercise. Bolded t values are significant ($p < .05$). * $p < .05$, ** $p < .01$.

Discussion

The primary research hypothesis was not supported, as there were minimal significant group differences between the specialization groups (low, moderate, and high), in regards to study variables of interest. In addition, the two significant group differences contradicted the research hypothesis, as highly specialized athletes reported significantly lower levels of a maladaptive psychological outcome and higher levels of an adaptive outcome. High specializers reported lower average levels of reduced accomplishment (negative evaluations of one's ability, achievements, and/or performance), when compared to moderate specializers. One potential explanation for the contradictory finding is that highly specialized athletes attained greater sport achievements/elite status (i.e. college scholarships and national championships), compared to moderate specializers. If true, this finding would support research, such as Ericsson et al.'s (1993) "10,000 hour rule", which argues for specialization as a necessity to achieve elite performance. Additionally, it would contradict previous research and anecdotal evidence, which suggests that specialization is not necessary, and potentially even a barrier, to reach elite status (Brenner, 2016; Gullich & Emrich, 2014; Malina, 2010; Moesch et al., 2011). While there were no direct measures of sport accomplishment in this study, 27.91% ($n = 12$; 1 case non-specified) of the highly specialized athletes self-classified as current varsity athletes, versus 11.11% ($n = 6$; 1 case non-specified) of moderate specializers. The decreased levels of reduced accomplishment

may also be due to differences in athletes' feelings of self-confidence. While limited in scope, in a qualitative study Macphail and Kirk (2006) found that athletes reported more positive feelings regarding sport experience when the emphasis was on deliberate practice versus deliberate play, a characteristic of specialization. The researchers suggested that deliberate practice challenges athletes, leading to increases in competency and subsequently, self-confidence in one's athletic abilities (Macphail & Kirk, 2006). In addition, due to the central role being an athlete plays in highly specialized athletes' self-identity and subsequently, self-esteem, sport accomplishments may be more salient (Gustafsson, Hassmen, Kentta, & Johansson, 2008).

Highly specialized athletes also reported higher average levels of the adaptive outcome of integrated motivation, compared to the low/non-specialized group. Integrated motivation is the most autonomous form of extrinsic motivation, in which behaviours and goals are assimilated into one's identity (Ryan & Deci, 2000). Researchers posited that the high levels of deliberate practice (effortful activities that are not inherently enjoyable) and decreased autonomy in training characteristic of sport specialization, would result in a negative relationship between specialization and autonomous sport motivation (Gould et al., 1996; Strachan et al., 2009). The contradictory finding may be due to the formation of a limited or unidimensional identity by highly specialized athletes, in which their role as an athlete is central to their self-conception (Coakley, 1992). A unidimensional identity could serve as a protective mechanism, preventing cognitive dissonance between the significant time demands and investment (physical, emotional, and social) required in sport specialization and one's values. However, it could also be maladaptive in situations such as injury or poor performance, warranting further research (Coakley, 1992). Additionally, other potential contributors to self-identity, such as participation in non-sport related activities, were not assessed in this study. Therefore, further research examining the underlying mechanisms of this specialization-motivation relationship, including assessments of athletic identity, and its effect on athlete health is needed.

Despite consistent findings in past research, no significant group differences in regards to risk of injury, including overuse injuries, were found (Bell et al., 2016; Jayanthi et al., 2013, 2015; Post et al., 2017). The lack of significant findings may be due to self-report of mechanism of injury, as past studies have corroborated reports of injuries with diagnoses from medical personnel in order to ensure accuracy (Jayanthi et al., 2013, 2015). Additionally, this study did not utilize a strictly elite youth athlete sample, therefore, specializers may not have been exposed to inherent environmental risk factors (i.e. high training volume and competition level) to the same extent as the samples in prior research. While most youth sport involves exposure to environmental risk factors, specialization has been posited to have an increased risk of maladaptive outcomes due to the degree of exposure (i.e. higher training volumes and increased repetitions). Previous research suggests that the experience of non-elite youth specializers and samplers are more similar than different, as an individual may be classified as a "specializer," but only train a few hours a week at a moderate intensity (Wiersma, 2000; Russell, 2014, 2015).

Despite minimal significant group differences, the findings do not suggest that the specialization environment is inherently adaptive. Sample and measure limitations (discussed below),

especially the small number of early specializers, may have minimized the negative effects of specialization and/or amplified the adaptive effects, relative to the actual population of American youth athletes. Additionally, group differences analysis masked some of the inter-individual variation, as the majority of athletes typically report low levels of maladaptive outcomes, such as burnout (Eklund & DeFreese, 2015). However, a small percentage of highly specialized athletes reported high levels of maladaptive outcomes, and any degree of burnout or other maladaptive outcome warrants examination due to the significant potential aversive effects on the individual and his/her athletic performance. In addition, in the case of negative sport experiences, highly specialized athletes may experience maladaptive outcomes to a greater extent versus samplers (discussed below). Furthermore, bivariate correlations suggest a maladaptive specialization-injury relationship due to environmental risk factors (i.e. high weekly training volume), in line with the aforementioned previous research (Bell et al., 2016; Jayanthi et al., 2013, 2015; Post et al., 2017). Past injury-rate was associated with the burnout dimension of sport devaluation. Burnout was also associated with other psychological health outcomes (i.e. athlete engagement, perceived sport stress, sport motivation, intrinsic motivation, and psychological resilience), in the expected directions. However, correlations suggest that the specialization environment may not be inherently psychologically maladaptive, with a significant negative relationship between number of seasons of sport participation and reduced sense of accomplishment. While contradictory to specialization theory and the research hypothesis, as posited by extant burnout theory, psychological outcomes are often dependent on individuals' cognitive appraisals and perceived demands and resources versus concrete environmental factors, such as training volume (Smith, 1986). In addition, burnout and other psychological outcomes have not been consistently associated with factors inherent in the specialization experience.

While the specialization environment may not be inherently maladaptive, the specialization-psychosocial health relationship still merits examination as specializers may experience high levels of burnout and other maladaptive psychological outcomes to a greater degree than samplers, in the case of a negative sport experience. Examination of the exploratory hypothesis revealed that athletes' psychosocial outcomes varied as a function of their reasons for specializing. Athletes who cited more intrinsic and positive reasons for specialization, such as the pursuit of athletic excellence, reported positive health outcomes (i.e. reduced sport stress). In contrast, those who cited extrinsic and potentially negative reasons, such as time demands, reported maladaptive psychological outcomes (i.e. higher global burnout levels). These findings align with previous research in which athletes experiencing entrapment (negative participation reasons) reported higher levels of burnout (maladaptive psychological outcome), when compared to athletes with more adaptive sport-commitment profiles (Raedeke, 1997). Together with the correlation and group difference findings, these findings suggest that the specialization environment may not be inherently psychologically maladaptive, but dependent on the individual athlete's experience and perceptions of sport-commitment and motivation factors. However, more nuanced research on the role of the reason for specialization is needed, as some of the choices to specialize could be interpreted as either positive or negative (Russell, 2014, 2015). For

example, "time demands" could be referencing either the time demands of the domain sport preventing an athlete from participating in other sports/activities or specialization as a way to decrease time demands of other activities, interpretations associated with distinct outcomes. Research has shown that withdrawal from activities due to autonomous choices between sports and non-sports activities is normative, and potentially psychologically adaptive, taking into account factors such as time demands, enjoyment, and ability (Wiersma, 2000). In contrast, youth athletes demonstrate decreased sport motivation and commitment (maladaptive outcomes) when they feel that their sport is conflicting with their social development and ability to participate in other experiences (Fraser-Thomas, Cote, & Deakin, 2008). Furthermore, the specialization decision findings are limited by a small sample of specializers or individuals who quit other sports to focus on one sport ($n = 46, 30.67\%$).

While the current study's findings were significant and warrant further research, there were study limitations that need to be addressed in future research. First, the study was limited by a small number of early specializers ($n = 10, 6.7\%$), which may partially account for the minimal significant group differences, as early specialization has been proposed to carry the most health risks (Cote et al., 2007; Cote, Horton, et al., 2009; Cote, Lidor, et al., 2009; Wiersma, 2000). The small sub-sample may be due to the use of convenience sampling, the small percentage of early specializers in the general population, and/or the method of classification. For example, while previously validated, Jayanthi et al.'s (2015) scale does not take into account individuals who only ever played one sport and therefore, never "quit other sports to focus on one sport." In addition, besides a moderate self-reported average weekly training volume ($M = 13.69, SD = 6.98$), there were no measures to clarify the intensity of the specialization experience, including both physiological training load and psychological resources demands. For example, the three-point specialization scale did not distinguish between a specializer who trains one or two days a week at a moderate intensity in a single sport, and one who trains five to seven days a week at a high intensity. This may also account for limited group differences, as previous research suggests that the experience of non-elite youth specializers and samplers are more similar than different (Wiersma, 2000; Russell, 2014, 2015). Finally, based on the preliminary findings, quantifying athletes along a continuum (low, moderate, and high) may not be an effective method of studying psychological health risks (Jayanthi et al., 2013, 2015). Instead, future research could utilize groupings based on athletes' perceptions of key factors in the sport environment (i.e. theoretically-based components of sport-commitment and motivation). For example, cluster analysis could be used to group athletes' into distinct sport-commitment profiles (i.e. sport entrapped, attracted, and low commitment), and examine group differences in profile composition (i.e. number of early and late specializers and samplers) and psychosocial health outcomes. Together, these limitations suggest that future research should utilize a more nuanced measure of specialization, accounting for individuals who have only participated in one sport throughout their entire athletic career and involving measures of factors associated with an elite sport specialization environment, sport-commitment, and self-determined motivation. The use of convenience sampling also limits the generalizability of findings, as the study sample was relative-

ly homogenous (76.0%, $n = 144$ identifying as Caucasian), over two-thirds female (68.0%, $n = 102$), two-thirds from one south eastern university (66.67%, $n = 100$), and solely college aged individuals ($M = 20.23$, $SD = 1.34$).

The cross-sectional, retrospective study design also poses methodological limitations. Due to the use of self-report, results may be affected by participant bias. In addition, recall bias is a concern due to the retrospective study design and the age of participants, with participants reflecting on sporting experiences that occurred up to eight years ago. Prior research has utilized adolescents, ages twelve to eighteen, in order to minimize this issue (Jayanthi et al., 2013, 2015). Furthermore, cause and effect cannot be determined due to the cross-sectional nature of the study, as the results may be directional and/or a third variable may be present.

Despite limitations, the study findings expand the current body of knowledge regarding the effects of specialization, especially in regards to psychological health outcomes. Results suggest a maladaptive relationship between specialization and physical health outcomes may exist due to inherent environmental risk factors. However, the direct relationship between specialization status and psychological health outcomes may be dependent on athletes' cognitive appraisals and perceptions relative to their specialization environment and experience, including the reason(s) for specialization, warranting future prospective studies.

In addition to implications for future research, study findings have multiple practical implications on an individual and societal level. At the individual level, findings suggest that specialization may not be inherently detrimental to youth athletes' psychological health. However, findings should be interpreted cautiously, as the costs and benefits of specialization are still unclear. Additionally, individuals who have a perceived negative sport experience may also experience maladaptive psychological health outcomes, potentially to a more extensive degree than non-specialized athletes. Therefore, coaches and parents need to carefully monitor athletes, especially highly specialized athletes, for signs of maladaptive psychological health, and provide a positive, task-mastery centered environment. On a bigger scale, the findings suggest a wide variety of potential areas for intervention, aimed at both the individual athlete and the sport environment (i.e. coping mechanisms, relaxation techniques, and promoting autonomy), may be effective in deterring athlete burnout and promoting a positive psychological experience for specialized youth athletes (Coatsworth & Conroy, 2009). Additionally, sport-governing bodies could implement policies accounting for youth athletes' developmental stages, such as limiting the intensity and volume of early youth training and competition, in order to minimize maladaptive physical health outcomes. Ultimately, this research aims to minimize the prevalence of maladaptive physical and psychosocial health outcomes in youth athletes via expanding the specialization knowledge base and subsequently, illuminating potential areas for intervention.

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Shelby Waldron is a senior psychology and exercise and sport science double major from Brandon, FL. The intersection of these majors along with her own experiences growing up in athletics, led to her interest in sport psychology. Specifically, as a future occupational therapist, she is interested in the effects of sport participation on individuals' every day functional abilities, including psychological and physical health, as reflected in the current study. Shelby's interest in the topic of sport specialization also came out of her own experiences. Throughout her athletic career she experienced both ends of the specialization spectrum and their respective costs and benefits, playing multiple sports at a young age and later choosing to specialize in volleyball. She hopes to use this research to educate parents, coaches, and athletes, and to inform sport governing bodies' policies regarding youth sport. In addition, Shelby plans to utilize the research and analytical skills she has gained in her future studies and career, as she pursues a clinical doctorate in occupational therapy in order to expand the extant body of evidence-based practice in the field.

Humanities

34-41

Mothers' Stories of Postpartum Depression: Coming to Voice and Healing the Self
by Clara Davidson

Clara Davidson's interest in health humanities, spurred on by research during her junior year, led her to analyze the importance of personal narratives within medical topics such as postpartum depression

51-63

Dance Dance...Evolution?: The Manipulation of the Female Narrative in Kathakby
by Sachi Pathak

Sachi Pathak is a trained kathak dance and, during a Religious Studies course with Dr. Harshita Kamath, began to study the complex evolutionary patterns of tawa'if culture, appropriation of Kathak in modern Bollywood, and colonial legacy of West on classical Indian dance

42-50

Mountain Stories: The Presentation of Coal Mining in Bluegrass Music by Madeline Fisher

Madeline Fisher researches the connection between bluegrass music and coal mining in the Appalachian mountains and what the music reveals about the complex relationship between communities and coal mining.

Mothers' Stories of Postpartum Depression: Coming to Voice and Healing the Self

by Clara Davidson

The Center for Disease Control and Prevention states that 1 in 9 mothers experience postpartum depression. If we extrapolate to the number of births annually, then an astonishing 900,000 women are affected by this illness every year. This study highlights the importance of stories in the field of medicine; no definition or description of symptoms could have as much impact as the personal accounts of those who suffered from this illness. Personal accounts also introduce new ideas that may not be obvious from scientific reports. Through memoirs, women confronted the stigma surrounding postpartum depression and voiced their support for those currently suffering. Studies in the Health Humanities highlight the importance of individual stories and personal experience as a way to understand and treat diseases like postpartum depression.

Keywords: Postpartum depression, narrative, motherhood, stigma, pregnancy

Childbirth is a life-giving act of welcoming a baby into the world and the joyful beginning of the irreplaceable bond between mother and child. But what happens when the new mother does not experience joy in the relationship? Or when this time of joyful welcome is clouded by thoughts of self-doubt and anxiety, and even of violence towards the infant? For the women who experience these crippling emotions after they give birth, it can be a time of severe depression and confusion as they struggle to understand why they are not experiencing the joy in their motherhood. Memoirs of women who have experienced postpartum depression provide an in-depth reflection of their experiences of this illness from the birth of their children to the final stages of recovery. These memoirs detail the feelings of shame that many mothers experience during postpartum depression, the importance of female support in their healing, and the key role that survivors of this illness can play in the push for better education, identification, and treatment available for new mothers.

The lack of women who receive treatment for postpartum depression can be related to the lack of awareness among new mothers about this illness. While there is some discussion in literature about childbirth about “baby blues” (short-lived feelings of depression that do not normally last more than two weeks following delivery), there is often little information provided about how this normal state of unrest can develop into long-term post-

partum depression and how to seek treatment should this occur. Unfortunately, many mothers are unaware of this illness or are unable to receive a proper diagnosis when these feelings continue weeks, months, and even years after a birth. When mothers experience feelings of unhappiness and anxiety for months following childbirth, they often worry about the reactions of others should they express their lack of joy in motherhood. The role of shame in preventing mothers from speaking out about their illness is crucial in the continuation of the silent epidemic of postpartum depression.

When experiencing postpartum depression, women express how important it is that they can share their feelings with other women without fear of judgment. While support from anyone is important, the abandonment and lack of understanding from other women can be especially difficult for new mothers who are striving to understand how to cope with their feelings. According to researcher Knudson-Martin:

Validation of distressing emotions may be provided from a variety of sources...However, responses by others mean to be supportive frequently disconfirmed the woman's experience. From study to study, women spoke of being told that “everyone feels this way” or “you're just a little down.” Validating feelings is different from normalizing them (Knudson-Martin 154).

Mothers with postpartum depression are aware that the emotions they are experiencing are neither normal nor healthy. However, when sharing these feelings with other women, it is important that these mothers are met with an understanding environment and that they are told their experiences are accepted as nothing to be ashamed of, but rather the result of a severe illness that can be treated.

Many of the personal narratives of mothers who had struggled with postpartum depression stress the need they had for other mothers to express support and understanding. However, it is often difficult for mothers to seek out community when they are coping with the shame of, what they believe, are feelings never experienced by other women. Because of this situation, women who have survived their bout of postpartum depression assume the role of advocates by speaking or writing about their experiences as a way of assuring other mothers that they are not alone in their struggle. These memoirs of women who have struggled and found healing from postpartum depression provide hope that there is life after this illness. In their memoirs, the survivors of postpartum depression dispel the shame that prevents women from speaking out during their struggles, highlight the importance of support from other mothers during the recovery process, and promote awareness for this illness.

An Introduction of Postpartum Depression

Following the birth of a child, many women develop “baby blues,” a psychological condition that peaks between 2-5 days after delivery and does not exceed 2 weeks. According to researchers Stewart and Vigod:

Approximately 70% of new mothers have mild depression symptoms called ‘baby blues’...[which] typically include weepiness, sadness, mood lability, irritability, and anxiety. ‘Blues’ do not seriously impair functioning or include psychotic symptoms; typically these symptoms begin to abate spontaneously within 2 weeks, although some cases will progress to postpartum depression. Distinguishing between postpartum blues and postpartum depression can be difficult, but assessment of mood and of severity of symptoms at multiple time points may facilitate making this distinction (Stewart 2178).

While “baby blues” are a common occurrence after birth, if symptoms continue to progress after two weeks, they develop into postpartum depression and the severity of the condition escalates considerably. The Center for Disease Control and Prevention states that research shows 1 in 9 mothers experience postpartum depression (CDC Depression among Women). If this statistic is extrapolated to the number of births annually, the astonishing 900,000 women affected by postpartum depression is greater than the number of cases of tuberculosis, leukemia, multiple sclerosis, Parkinson’s disease, Alzheimer’s disease, lupus, and epilepsy combined (postpartumprogress.org).

While these numbers are alarming, what is even more alarming is the lack of predictability of this illness. The self-help book *This Isn’t What I Expected* states:

Postpartum depression frequently strikes without warn-

ing—in women without any past emotional problems, without any history of depression, and without any complications in pregnancy. PPD strikes mothers who are in very satisfying marriages, in difficult marriages, or who are single, lesbian, or cohabitating. It strikes women who had easy pregnancies and deliveries, as well as women who suffered prolonged, complicated labors and cesarean sections (Kleiman 2).

Thus, postpartum depression, the official diagnosis once “baby blue” symptoms continue more than two weeks after birth, affects a large cross-section of women. Once a postpartum diagnosis has been reached, the treatment methods vary between medical professionals and based on the severity of symptoms. Treatment options can include, “medication, psychotherapy, counseling, and group treatment and support strategies” (Gulli). Because it is important that mothers be aware of the medical options available to them, a variety of treatment options are considered once a diagnosis has been reached. Once all the options are considered, “Management depends on the patient’s medical history, the severity of the symptoms, the effects on the functioning, the woman’s preferences, available expertise, and resources” (Stewart 2184). There are multiple treatment options for postpartum depression and can be tailored to fit the individual needs and expectations of every mother. With so many treatment options, it is surprising that there continues to be a population of mothers who live with crippling postpartum depression, unaware that there is help and too ashamed to seek help for their illness.

While there are a multitude of treatment options available to mothers with postpartum depression, the difficulty of getting women to seek treatment continues to hamper efforts to recovery. When recalling her experiences with postpartum depression, Adrienne Martini states, “Despite all of our warm and fuzzy talk about how depression is a physical disease caused by a chemical imbalance, it still has a big stinking stigma attached to it” (Martini 175). Like so many other women, Martini felt that her illness was a shame and would make others think she was an unfit mother for her child. Martini recalls how she worried that friends and family would ostracize her for not being the expected joyful mother after the birth of the baby. She feared that if other knew what she was experiencing, she might even have her child taken away due to her inability to care for her. Martini is not alone in these fears; many other survivors of postpartum depression recall similar worries:

I was certain that nobody else could possibly feel what I was feeling...Postpartum depression was a crazy person’s affliction, and I associated it only with those people who harm their kids by doing things like driving the car into a lake. I was certainly not in that category...Postpartum depression was plainly not something that affected someone like me. It hit only those people you read about in the news (Shields 83).

Shields associated postpartum depression with women who were plastered across the front page of newspapers for injuring their children or taking their own lives. Unlike these extreme examples, most women who suffer from postpartum depression do not end up committing murders or killing themselves. With these individuals being the public examples of postpartum depression,

women fear to be diagnosed with this same illness. These mothers are so ashamed of their feelings that they fail to realize that these emotions are the result of an illness and instead choose to hide their suffering from even friends and family. The unfortunate result is that postpartum depression is often left untreated, and mothers continue to struggle with this illness alone.

When Marie Osmond opened up about her bout with postpartum depression, she received an influx of letters from women who had also suffered from depression after childbirth but had never felt comfortable sharing their stories before. “Each of the stories are different,” writes Osmond. “But they all made a reference in some way to one thing we shared: shame” (Osmond 183). The shame that is attached to this form of depression results from the mothers’ inability to align their current feelings with their expectations of life post-childbirth. Osmond speaks about the pressure she placed on herself and the expectations she tried to meet following the birth of her youngest child. She suppressed her feelings of hopelessness and instead tried to fulfill the role of joyful mother. Even her close friends and family were oblivious as she began to struggle with suicidal thoughts.

Feeling ashamed of postpartum depression prevents many mothers from discussing their illness with even medical professionals. When trying to explain why she never sought medical treatment during her postpartum depression, Brooke Shields cited shame as one of the main reasons for her inability to approach a doctor with her struggle. “I hadn’t even told my doctor what I was feeling,” she writes. “It was just too shameful” (Shields 78). In her darkest hour, she felt too ashamed to even turn to a medical professional about her emotional state, worried that she would be seen as a failure rather than the victim of a disease. In her study on self-help and postpartum depression, Verta Taylor found that “fewer than 20 percent of these women ever discussed their emotions with obstetrician-gynecologists, family practitioners, pediatricians, or other health-care providers” (Taylor 37).

While feelings of shame contribute to the lack of women willing to seek medical attention, the fear that their illness will not be taken seriously is another concern that also deters them. Women still worry that they will be told that this is simply a long stretch of “baby blues.” According to Knudson-Martin, “Women reported feeling that some healthcare providers minimized or were insensitive to their distress, sometimes suggesting that the mood would just pass or that everyone has the blues” (Knudson-Martin 153). This concern, coupled with the feelings of shame, results in large numbers of women remaining silent about their illness.

When reflecting on how long she lived with undiagnosed postpartum depression, Shields states in frustration that this illness, “left undiagnosed, can be chronic and devastating. The mother may be racked with guilt and ravaged by hopelessness, and the rest of the family is affected as well” (Shields 139). Without treatment, this disease can wreak havoc on the mother, infant, and family for years after childbirth. It is crucial for the well-being of these mothers that education about this disease and the treatment options dispel feelings of shame that prevent many women from speaking out about their illness. When reflecting on her experiences with postpartum depression, Heather B. Armstrong states, “Why should there be any shame in getting help for a disease? If there is a stigma to this, let there be one. At least I was alive. At least my baby still had her mother. At least I had a chance at a better life” (Armstrong 194). Once mothers are able to realize

that there is no shame in their illness, they will be able to reach out and receive the treatment they need to recover and continue their lives.

The Role of Female Friendships in Postpartum Depression

A constant refrain in the memoirs of women with postpartum depression is how finding support from other women was crucial to their recovery process. When attempting to cope with the difficulty of postpartum depression, many mothers remarked on the importance of continual support from other women, especially mothers who had experienced childbirth. In her study of mothers with depression, researcher Mauthner states that, “One of the most unexpected findings to come out of my research was the importance of relationships with other mothers to the women’s psychological and emotional well-being” (Mauthner 134). This research finding was reaffirmed repeatedly in the personal memoirs of mothers who had recovered from postpartum depression. Throughout these personal narratives, these mothers repeatedly credited their successes in their treatment and healing to the continual support from strong female friends who took part in their journey.

Forming friendships with other mothers can help those currently struggling with postpartum depression to realize that they are not alone in their struggle. Many women feel alienated from other mothers, assuming they are the only ones to experience this depression. The horror of experiencing something that most books on motherhood shy away from or only present in the most extreme cases leads many women to believe that no other mother has ever felt uninterested, unattached, or hatred for their infant. Martini dryly recalls that in the beginning stages of her depression, she felt betrayed by the mainstream portrayal of motherhood. In the confusion of her dark emotions, she recalls feeling that, “If I’d had the energy, I’d have written every last magazine editor and writer who had ever run a happy, sappy piece about the miracle of birth” (Martini 85). As she still believed that her struggle with mental illness stemmed from her relatives’ depression-prone history, Martini was not aware that there were many other mothers outside of her family who had experienced similar depression after childbirth. She felt alone in her struggle and when she eventually was committed to the psychiatric wing of the local hospital, she was surprised when another mother reached out and told her, “I went through the same thing when my first was born...you’ll get through it” (Martini 167). This small statement of support from another mother who had gone through a similar experience was the beginning of a friendship that helped Martini recover from her postpartum depression.

Other mothers cite similar experiences when they realized that they were not alone in their feelings. The impact of women reaching out to these currently struggling mothers has an immense impact by revealing a community of women who are rarely revealed by the media. In her account of healing post hospitalization, Shaw writes,

As I’ve recovered myself and shrugged my shoulders out of that awful introversion, I’ve noticed how dense a constellation of other women is clustered around me. I seem to have been inducted into a silent community. There are so many others...who have suffered some form of

deep misery after the birth of a child, more than I would possibly have imagined (Shaw 160).

Once she realized the great multitude of other mothers who had suffered from the same illness, Shaw began to seek out fellowship with these women who had shared her experiences. Had she been aware at the onset of the large number of women who had struggled with postpartum depression, Shaw wondered whether she would have identified the signs of her illness earlier and realized that it should not be a source of shame. Marie Osmond echoes this belief, stating, “We have become so self-contained that it’s easy to fall into a pattern that doesn’t include real communication or emotional support from others, especially other women facing the challenges of raising children” (Osmond 31). The emotional support that can be gained from forming a group of mothers who share their experiences with birth, raising, and family relationships is pivotal. Osmond reflects in her memoir that, too often mothers do not take the opportunity to create meaningful bonds by sharing feelings and experiences, so when a woman begins coping with postpartum depression, she is unaware that many other mothers have experienced similar feelings.

Osmond also provides an example of how mothers often do not need to seek out new friendships when they are seeking support during postpartum depression. Many mothers likely already have relationships with women who have struggled with this illness, but due to the silence around the topic, even their female friends are unaware of their difficulties. For Osmond, while she was aware that postpartum depression existed, she was unaware of her personal connection with any mother who had suffered from this illness. When she tried to open up about her illness, she recalls that while she found people who wanted to help her, none of them appeared to understand the suffering she was going through. Finally, during her breakdown which led her to flee her home and children, she received a phone call from her mother. Her mother revealed that she too had suffered from postpartum depression and that while the suffering was difficult now, it was possible to get through it. Osmond writes, “My mother made me feel I could go on. She had no instant cure to offer or great advice that made the light breakthrough for me. She merely had an admission. She simply said that she knew what I was going through. There was someone who really understood, and it was my mother” (Osmond 140). After reflecting on her experiences with postpartum depression, Osmond realized that the thing that had the most impact and saved her life was the revelation that she had a close female friend to whom she could turn for understanding and acceptance.

In Verta Taylor’s study on postpartum depression, one woman who had suffered a severe bout of depression following the birth of her first child found that she did not experience a relapse after her second child and credits this success to the fact that, “she had developed a ‘safety net’ of other mothers” (Taylor 15). This “safety net” of other mothers, whether prior victims of postpartum depression or not, that provides support and community to a mother after birth, are credited by postpartum testimonies as a way to strengthen women on their path to recovery and help prevent relapses. Another woman from Taylor’s study stated that, “she found support during her recovery by talking with two other women who had also been hospitalized for postpartum illness... it was only after meeting these women...and discovering they felt

the same way she had” (Taylor 73) that this mother was able to heal from her illness. Having a network of other mothers who have experienced postpartum depression can provide reassurance that no mother struggling with depression is alone in her illness. Shields remembers that when she struggled with her depression, she “wanted to find the community of people who said, ‘oh yeah, I felt the same way. Mine was bad, too, but don’t worry, many mothers feel that way. It really will pass’” (Shields 144). The impact that another mother simply saying, “Yes, I know what you are going through” and forming a friendship can be the life-saving statement that means the difference between life and death.

While female friendships are important and provide immense benefits by allowing mothers to realize that they are not alone in their struggle, some memoirs also commented on how female friendships were also a source of difficulty. Some mothers going through postpartum depression, would struggle with comparing themselves to other mothers who appeared to be better mothers, have happier babies, more satisfying marriages, and more enjoyable lives. One mother recalls that when she began to reveal her feelings towards her child and motherhood to friends, “they were unsympathetic when she talked about...the fact that it discouraged her from having another child” (Mauthner 16). This revelation only resulted in her being alienated from her female friends rather than receiving the support she needed. For some mothers, the idea that a woman would not love her child and being a mother can feel like a threat to their own experience. Perhaps because their experiences aligned with the idea of childbirth being a wonderful time, they struggle to relate to a mother who does not have a similar experience.

The lack of acceptance from other mothers was testified to by several mothers in their memoirs, including Brooke Shields, who spent the majority of her adult life wanting and struggling to have a child. After the birth of her daughter, Shields was struck with a severe case of postpartum depression and found herself struggling from her lack of knowledge about the illness and exposure to those who have previously struggled with the disease. She recalls that when she tried to find a community of mothers to support her in this difficult time, she struggled to find anyone willing to offer understanding acceptance. Rather than acceptance, she was met with negativity; “the problem was that I wasn’t met with this response; instead, the opposite occurred. Most people couldn’t believe I could have experienced anything so negative” (Shields 144). This lack of acceptance among other women can result in mothers with postpartum depression simply withdrawing further into themselves and no longer seeking out support. When already struggling with feelings of shame about their mental state, it can be excruciatingly difficult to then hear these worries affirmed by criticism from others. This is a difficult situation since so many mothers struggling with postpartum depression found that, “talking to another mother was, for many, the key to moving out of depression...the most valuable kind of help they either wanted or received came in the form of talking to another mother about their feelings” (Mauthner 143). Given this information, there exists a two-sided situation in which some mothers are received into a safe, non-judgmental environment while others are faced with criticism due to their inability to “get over” their postpartum depression and care for their child.

Though there are instances of negative interactions with other mothers in the memoirs, the majority of the authors’ interactions

tended to be beneficial to their recovery. Receiving support from other mothers, especially those who may have previously gone through postpartum depression, was consistently cited as a positive and even life-saving experience. Marie Osmond wrote,

I kept reflecting on how much my mother helped me through my lowest hours with that phone call in the motel room. I often wondered where I would be if she had not shared her story with me. It had sparked a flame, and however dim it was in some moments, it was a beginning. I held on to her story with hope for my own future (Osmond 179).

Many women wrote at length about how positive interactions with other mothers helped in their recovery and that, though instances of unsupportive women did occur, the majority resulted in finding support and comfort during their postpartum depression.

The theme of female friendships plays a predominant role in many postpartum depression memoirs. While countless mothers recall the need and want for strong, supportive female friends, not every mother was able to find this support during their illness. Unfortunately some mothers received little understanding from the women closest to them and felt too scared to seek out other women after being met with that response. Thus, it is of utmost importance that women recognize the importance of supporting mothers going through this struggle and sharing their experiences of postpartum depression with trusted friends. While they may be met with difficulty or lack of support from some, it is important to highlight that this is not the overarching reaction to mental illness in new mothers. Strong female friendships were a saving grace to many mothers during their postpartum depression struggles and eventual recoveries. By refusing to remain silent and supporting mothers currently going through postpartum depression, women are helping end the shame surrounding this illness and helping other mothers build themselves up after going through this struggle.

The Role of Postpartum Depression Memoirs

Although developing friendships with other survivors of postpartum depression assists in the healing process of many individuals, the difficulty still remains in the hidden nature of this illness. While self-doubt and shame often prevent those currently struggling from seeking out friends to support them during their illness, survivors of postpartum depression have the ability to share their stories and experiences. By writing or speaking about their experiences, survivors can become advocates for those still suffering from this illness by increasing awareness and allowing those still struggling to realize they are not alone. The writers of these memoirs help educate and increase awareness while also offering support to women who do not have the courage or ability to find a supportive community to assist in their recovery.

Reading about the experiences of a survivor and realizing how it aligns with one's current struggles can provide mothers with the ability to recognize their own illness. For many mothers, the lack of education about postpartum depression means they were left unprepared to recognize the symptoms of this illness when recovering from childbirth. While they could sense that something was wrong, frequently women were only able to understand their

feelings when hearing a personal account of postpartum depression. In *Down Came the Rain*, Brooke Shields recalls that, "My friend...brought me two books on different women's accounts [of postpartum depression]...and begged me to page through them" (Shields 82). While Shields was hesitant to read the books of "crazy" mothers who she was sure did not relate to her life, she finally began to read the accounts. She remembers feeling a sense of calm after reading these books because, "though my doctor had been helpful medically, it wasn't until I began reading other women's accounts...that it became painfully clear" (Shields 141). Shields was aware that her experiences were not normal, but she was not able to identify her pain until she read accounts written by women who had shared her experience. Shields was shocked to realize that she had postpartum depression and after going through her recovery, wondered whether other mothers felt the same way. She states, "I considered myself a well-informed, educated person. If this illness had taken me by surprise, I reasoned, I probably wasn't alone. Were other women enduring this in silence...because they were unaware of what it was they were going through?" (Shields 143). Once struck with this realization, Shields was determined to speak out about her illness and become an advocate for those still suffering in hopes that her personal experiences may allow mothers to realize what they are struggling with before it is too late. The validation that can be gained from reading about another mother's experience can enable other women to identify their illness while simultaneously realizing they are not alone in their struggles. One mother recalls, "I thought I was the only one going through this until I read that article on Governor Dick Celeste's wife in the paper, and she sounded like she had just what I had" (Taylor 23). The realization that someone else is willing to publicly share their struggle with postpartum depression provides reassurance to those who are currently going through the recovery process.

Memoirs of postpartum depression can help mothers realize they are not alone in their struggles and help support them in their first steps of reaching out to other women to find a strong community. One mother, Pam, recalled that during her depression she craved human contact, but she felt unable to reach out to other mothers; "When you're ill," she explains, "you can't do it, you know what I mean, you can't phone somebody else up although you want to" (Mauthner 16). However, Pam felt that if she had seen someone publicly share her story of postpartum depression, she may have felt empowered to do the same with her close friends and build a supportive community to help her through her struggles. Reaching out to female friends can be a challenging task for someone with depression. In order to reach the point where they feel comfortable reaching out, mothers need to recognize that they are not alone in their experiences and that postpartum depression is temporary—both things that memoirs can provide.

While some women felt compelled to write their memoir as a way to provide reassurance and clarity to other mothers, other women chose to record their experiences as a way to make sense of their postpartum journey. Fiona Shaw states that, "I had no intention of writing a self-help book, but I thought I would be helping myself now if I could put myself in the picture" (Shaw 155). She felt that by writing down her experiences, she would be able to better understand her past and continue her recovery process. After a period of being unable to control their own thoughts and

feelings, these women chose to write about this period as a way of reclaiming this time of depression. Shaw recalls that, “when I began writing this book, I did so in the effort to shore myself up against the whirling chaos of my mind” (Shaw 204). Going through postpartum depression is often a life altering experience that requires mothers to reassess their outlook on motherhood and how they view themselves as women. By writing down their experiences and reflecting on their struggles, women can come to a better understanding of what they went through and how they can recover from their postpartum depression. These memoirs can be a way for these mothers to feel that they have completed their recovery of postpartum depression by writing about their experiences as occurrences in the past that they overcame.

Survivor advocates are powerful figures in the field of postpartum depression; they help educate, provide support to those who feel alone, and use their advocacy to gain personal healing. When researcher Verta Taylor asked one of her research participants why she chose to write about her experiences, she replied,

I started with being angry that other women were suffering alone, and I vowed to just raise my voice high so that other women will know that you get better, you get through this, you survive this. It really basically was to support other women who were going through it (Taylor 74).

For many women who recovered from postpartum depression, detailing their experiences was a way of speaking out against the stigma that surrounds their illness while offering support to other mothers who may be currently suffering. Many remember how lost and alone they felt during their depression after childbirth and want to use their experiences as a way of ensuring that other mothers will feel more support when going through their postpartum depression. These women feel that by writing about their experiences, they can expand the discussion about postpartum depression, educate mothers who may not be aware of their symptoms, and provide continual reassurance to those who feel they are alone in their struggles.

Conclusion

Postpartum depression is a severe illness that can develop in any mother after childbirth. While the shame associated with postpartum depression often prevents mothers from speaking out and seeking help for their illness, women are able to gain support through female friendships. Memoirs of postpartum depression constantly reiterate the importance of female support for mothers trying to find their way after childbirth. Some survivors of postpartum depression use their own recovery as an opportunity to speak out on behalf of those still suffering in hopes that their personal testimony will contribute to breaking the silence around this illness. While postpartum depression is often a terrifying reality for mothers, the journey from suffering to healing can be seen in a positive light by survivors of this illness. In one study on depression among mothers, researchers noted that many women felt that their depression “made them better mothers because by recognizing and taking into account their own needs, as well as those of others, they were providing their children with more realistic models of parenting, parent-child relationships, and in-

deed relationships in general” (Mauthner 22-23).

After recovering from their depression and through the support of other women, mothers are able to use their illness as an opportunity to reflect on their views on motherhood, child rearing, and mental health. The recovery of this illness can be a process spanning months or even years, but by using their experiences to encourage those still suffering from the illness, it can be a powerful way to allow mothers to realize there is life after postpartum depression.

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Clara Davidson is a senior and a double major in English and Political Science. Her interest in health humanities was sparked following a class project on depression her junior year. In addition to this research, she has also assisted with research on minor domestic sex trafficking and early twentieth century childrearing practices. During her time at UNC-Chapel Hill, she has especially enjoyed the many professors who have helped her as instructors, research supervisors, and mentors. After graduation, she hopes that research will continue to play a role in her future career.

Mountain Stories: The Presentation of Coal Mining in Bluegrass Music

by Madeline Fisher

For many people living in the Appalachian coal centers of the United States, bluegrass music provides an outlet for individuals to express the impact that coal has on their lives and communities. In analyzing music recordings, literature, and interviews with bluegrass musicians from coal mining communities, there have been identified two ways by which coal and its repercussions have been reflected—and continue to be reflected—in bluegrass music. The ties that bluegrass and coal have to one another are underpinned both by the way that coal appears as a theme, topic, and refrain in bluegrass music, and by the way that the music has been incorporated into activist efforts. The relationship between coal and bluegrass is indicative of a regional identity in parts of Appalachia, and as such, serve as compelling outlets for which personal narratives can be communicated

Keywords: Appalachia, music, bluegrass, stories, coal mining

In Wellsburg, West Virginia, a small group of college students play “The Yablonski Murder” by Hazel Dickens, a bluegrass song about the murder of a coal miner union member, to an auditorium full of high school students.¹ The band is playing the song with the same musical style and the same instruments that musicians from the hills of West Virginia used in the 1950s. Why are bluegrass music and coal so intertwined even today, and what, if anything, has changed? The aim for this paper is to answer these questions by identifying how the coal industry has impacted people from coal mining communities in different ways over time, and how these issues have come to be expressed in the music. This paper will contain discussions on how bluegrass music has served as a lens through which coal narratives can be shared among those in the area, as well as people removed from the place.

The first time the style of music that we now know as bluegrass was played was in 1945 when Bill Monroe’s band, the “Blue Grass Boys,” hired Lester Flatt and Earl Scruggs whose distinctive guitar and banjo styles combined with Monroe’s mandolin to create a new style of string band music. The typical band in this emerging style was composed of five acoustic instruments: upright bass, mandolin, banjo, guitar, and fiddle. The singing was characterized by high lonesome vocals, accompanied by tight vocal harmonies. Instrumentalists would take virtuosic solos in between verses, often done improvisationally. Later, Flatt and Scruggs left the “Blue Grass Boys” and formed their own band, “The Foggy Mountain Boys,” and throughout the 1950’s and 60’s, they played a huge role in disseminating bluegrass music across state lines by

radio and TV performances.² This bluegrass style was a representation of Appalachia, the place several original members called home. Here, it was a part of the mountains, the hollers, the small communities, and the mines. Later in this paper it will be argued that bluegrass became a way of life for coal communities, and a way of communicating the experiences of those lives.

Coal from the Appalachian region has been a significant contribution to the U.S. energy sector since the late 19th century, when railroads made the transportation of coal feasible on a national level. Coal ‘camps’ comprised of miners and their families developed around the mines. These coal camps contained housing and one-stop-shop company stores, virtually entrapping its residents and workers and allowing coal companies to financially exploit its workers. The resulting oppressive and impoverished nature of these company towns fostered tight-knit relationships among its occupants. Another problem associated with mining was the danger to its workers, in that many died from unexpected explosions or from the inhalation of coal dust. These were significant challenges for the workers in the coal industry.

While coal’s relationship with this region cannot be described as effortlessly symbiotic, something that has always thrived in this space is music, and more specifically, bluegrass music. Bluegrass is a cultural phenomenon in Appalachia, which can be seen through the spaces it inhabits. While bluegrass can be found in places across the U.S. its beginnings were experienced (and continue to be experienced) at the local level and through live, amateur performance. Local people play in local bands, engaging in a community-oriented practice of music making. People of all ages

participate in this style on a weekly basis. The coming together of people to make bluegrass music is best encompassed in what is known as the bluegrass 'jam'. The bluegrass jam is an informal gathering that can take place in a home, in a coffee shop, or any place that community members can come together to play music. The traditional bluegrass songs or standards that most people are familiar with are often the source of repertoire that is played at these jams. Musicians will take turns playing solos, known as 'breaks,' and harmonize with one another.³ Many musical anecdotes describe how these jams can go on for hours through the night. Bluegrass jams became a normal occurrence, a part of daily routine. Here, this gathering and communication marks the intersection of people, livelihoods, art, and subsequently, coal. Community members would find commonalities through their proximity in living, their sharing of things they hear on the radio, and their occupations. In doing so, coal mining made its way into the bluegrass style. Traces of this merging of style and symbols can be found in country musician's return to the 'mountain sound' in some of their albums.

Bluegrass is so interwoven with public narratives about coal and the Appalachian region that musicians draw on bluegrass when talking about both the place and coal narratives. For instance, Kentucky native country singer Dwight Yoakam, best known for his work in honky-tonk styles and Grammy award-winning country vocals, temporarily delved into bluegrass when making an album about coal mining, *Swimmin Pools, Movie Stars...* (2016). For him, this was a personal topic he tied to his grandfather, who was a coal miner. Yoakam describes his grandfather as having experienced traumatic events such as mine cave-ins, and the death of friends and family in the mines. Yoakam is best known for his country music, although in 1990, *Vanity Fair* wrote that "Yoakam strides the divide between rock's lust and country's lament," (quoted in Dahlin 2016).⁴ Thus, his use of the bluegrass style in recording this album represents a departure from his normal musical style. This signifies the strong ties that bluegrass has to Appalachia, as well as the strong ties that bluegrass has to the coal mining narrative: in order to write an album about coal, Yoakam felt compelled to adopt the sound of bluegrass.

In his song, 'Miner's Prayer,' Yoakam describes the thoughts that his grandfather had when working in the mines, and tells the story about his life that Yoakam felt needed to be heard. In an interview with Terry Gross, Yoakam said "I'll never escape the influence of him in my life. And with his wife, my grandmother, Earlene Tibbs--those experiences with them shaped me musically probably more profoundly than anything else in my life."⁵ One of the bluegrass greats, Ralph Stanley, helped Yoakam to record this song on his album. It was recorded in a studio with the musicians and their acoustic instruments in a circle around one microphone, as is common in bluegrass performances.⁶ This leaning toward the more specified bluegrass style is indicative of a trend wherein country musicians use the bluegrass style to share coal mining stories.

Other artists have been known to gravitate towards bluegrass style when singing about coal. Patty Loveless, a country musician raised in Kentucky, recorded the album *Mountain Soul* (2001) in the bluegrass style. Her father died from black lung disease, a common consequence of working in the mines. This inspired her to record the album, and include in it the Darrell Scott song

'You'll Never Leave Harlan Alive,' about a Kentucky coal miner struggling to provide for his family. The way that bluegrass and these personal, coal-centered narratives fuse in these musicians' work is widely recognized: an article about Loveless pointed out that she "tapped into the bluegrass and mountain music of her Kentucky heritage and emerged with something compelling and deeply personal."⁷ While it is not a large leap for musicians such as Loveless and Yoakam to slide into a bluegrass sound, it is still a significant shift that has been noted by reviewers, critics, and fans alike as representative of the deep connections between topic and sound.

To investigate the nexus of coal and bluegrass, I spent three months listening to, talking with, and observing musicians who lived in West Virginia. I attended bluegrass jams and analyzed literature focusing on bluegrass style and the musicians associated with the style. I also researched the bluegrass repertory, paying particular attention to songs written about coal, or by people with connections to coal. Many of the coal songs in the bluegrass repertory originate from earlier folk songs as has been chronicled in Archie Green's *Only a Miner* with the first officially recorded coal folk song dating back to 1908.⁸ As such, these particular musical works existed long before bluegrass, though many of the songs within Green's anthology have since been repurposed in the bluegrass style. This paper explores songs that have been performed in the bluegrass tradition, in order to emphasize the power in the distinction between the two. When coal songs are expressed in the bluegrass style of playing, they carry with them a sense of place and shared commonality among people.

The arguments in this paper will only use musicians originating from coal mining areas of Appalachia. This paper analyzes the ways in which the varying content within bluegrass music has taken parallel paths with the varying mining practices of the region, and the use of bluegrass in local activism, in order to identify how bluegrass has served as a shared identity and thus, the genre of music to which people turn to relive their experiences.

Content and themes in bluegrass music

Bluegrass songs often fit into one of a few common themes--or perhaps even tropes: drinking, loneliness, or nostalgic reminiscences of 'home.' Another common theme is coal mining. Bluegrass has been made up of these themes for essentially the entirety of its seven-decade existence, and the coal theme is no exception. Coal has remained a part of bluegrass music since it first spread to Appalachia, and continues to be so in the modern day.

The best-known performers in bluegrass made coal songs a core part of their repertory by the 1960s. The "Father of Bluegrass," Bill Monroe, recorded "Nine Pound Hammer" in 1961. Monroe was born in Rosine, Kentucky, in 1911, the youngest in a large family. His father mined coal and farmed on their land. Monroe's roots in coal country lend added importance to his songs about coal. In this song in particular, parts have been traced back to 1891, which is a prime example of a traditional folk coal song being adapted and incorporated into bluegrass.⁹ Flatt and Scruggs, the other first-generation bluegrass artists who helped establish the genre, recorded "Coal Loadin' Johnny" in 1962, a song that critiques the inevitably hard life and poverty that came with that labor, and also "Coal Miner's Blues" that same year.

Later generations of bluegrass musicians have also pulled oth-

er genres' coal songs from the mid 20th century into their common repertory, and in doing so have simultaneously reintroduced the content that these earlier coal songs typically included into present day performances. Much of early coal songs described the lives of coal miners and many of the issues that plagued those lives. For instance, "Dark as a Dungeon" is a song written and recorded by Merle Travis in 1946, and another example of a folk tune redone in a bluegrass style by Kathy Mattea, Sam Bush, and other bluegrass artists in more recent years.¹⁰

Well the midnight or the morning or the middle of day
Is the same to the miner digging away
Where the demons of death often come by surprise
One fall of the slate and you're buried alive

Chorus:

Where it's dark as a dungeon and damp as the dew
Where danger is double and pleasures are few
Where the rain never falls and the sun never shines
It's dark as a dungeon way down in the mines

Here, Travis describes the dangerous conditions and equates working in the mines to being trapped in a dungeon. This description of the mines is typical of many of the coal mining songs of the day, both in and out of bluegrass. Many musicians characterized the mines as dark, hellish places in their songs. The work itself is often described as grueling and physically demanding. For example, in Hobo Jack Adkins's "Thirty Inch Coal," he describes the cramped working conditions when miners use a machine commonly referred to as the 'lizard' to navigate a thirty-inch opening in the ground. He also emphasizes the danger associated with mining, by shining light on the possibility of not making it home at night in the following lines from this song: "Are your wife and children gonna see you tonight/Waiting in that mountain as its always been/ Waiting in that mountain that's taken your kin."¹¹ These specific issues focus on the technique of deep mining, an approach to coal-removal that is mostly a part of the past, as much of the U.S. has moved away from deep mining. Yet although the techniques have changed and those particular risks have been reduced, today's methods have their own risks and problems, and the songs indicate those in their lyrics as well.

Mining has been increasingly done with highly mechanized processes, requiring fewer workers. In West Virginia alone, the number of employed coal miners has decreased from 150,000 in the mid 20th century to about 20,000 as of 2016. Additionally, the rise of natural gas and renewable energy have significantly decreased the demand for coal in the past couple of decades.¹² As such, the coal industry has sought out cheaper ways to mine. Many companies' solution has been to employ the use of mountaintop removal mining (MTR) or strip mining, techniques that use explosives to blow up the top of a mountain in order to get to the coal seam. Though it may come at a lower monetary cost, the ecological costs are high, which has become a topic for many bluegrass musicians in recent years. Musicians have used their music as a way to describe the current impact that mining is having on their communities and their surroundings.

The music that has come from present-day musicians is sometimes layered with dualities of identity. Songwriters may find themselves living in a new hybridized life, where they have old

family history in the coal industry, yet also have other ties that pull them ideologically in different directions, exploring complicated and oppositional relationships with coal. These identities may include backgrounds in environmentalism, academia, or politics that conflict with the sense of heritage that many musicians associate with coal. As such, there are a variety of different perspectives represented in song lyrics on issues involving the coal industry.

Musicians with academic backgrounds may use their knowledge of coal's environmental impacts to inform their work, while also incorporating their own experiences growing up in mountain communities. One such musician is Dr. Shirley Stewart-Burns, a historian, musician, author, and environmentalist, who grew up in Matheny, West Virginia. Her father was a singer and a coal miner, before he died of complications from black lung disease. Though her father was employed as a deep coal miner, Stewart-Burns is most associated as being a scholar on MTR.¹³ She is widely known for her book *Bringing Down the Mountains: The Impact of Mountaintop Removal on Southern West Virginia Communities*.¹⁴ However, she has also told this story through songwriting. "Leave Those Mountains Down," is a song she wrote about the impacts of mining.¹⁵

Chorus (Excerpts):

Leave that mountain down, boys
...
My daddy was a miner, and my grandads too.
...
What gives you the right, King Coal
To tear these mountains down
Once you've stole her treasures, you'll not hang around
Although you'll have your riches
Behind a shell you'll leave
And the mountain citizens will pay
For all your lust-filled greed
...

In this song, she honors the legacy of the lives of her father and grandfathers, the lives of coal miners. She also shows her resentment towards the coal industry for destroying the mountains where she grew up, as is clear with her use of charged language such as "lust-filled greed."

"Southern West Virginia, especially Wyoming County, has its fingerprints all over my creative work. My upbringing there has touched every facet of my life," explained Stewart-Burns in an interview.¹⁶ Thus, her community has inspired her work, but the industry's use of MTR on the mountains has threatened her community, and so it is this particular impact on her life that gets communicated most strongly through her songs.

Others may express opinions or perspectives that are not as staunchly against the mining industry as Stewart-Burns's, but still strongly oppose certain techniques used by it. Billy Edd Wheeler, a songwriter, playwright, and author originally from Boone County, West Virginia, has written many critically acclaimed songs about coal, and more recently, the mountains of West Virginia and Kentucky. His song "Let the Mountains Roll" expresses his deeply felt objections to MTR on the grounds that it harms real people. Al, Alice, & Ruth, a band from Kentucky with a loyal local following, recorded it on their eponymous 2013

album:¹⁷

There's something out of sync
Between the taking and the giving
I feel it in my bones and in my head
And I remember what my brave and conscientious mother said
She said, let's pray for the dead, and all those who've gone ahead
And let's fight like hell for the living

Let the mountains roll, let the mountains roll
Take the coal from the ground, but don't blow the mountains
down
Oh, let 'em roll, let 'em flow, let the mountains roll

Here Wheeler's lyrics implore the coal industry not to use MTR as their mining technique. The line, 'take the coal from the ground, but don't blow the mountains down,' seems to imply that Wheeler's opinions on the coal industry differ slightly from Stewart-Burns,' in that he doesn't object to the coal industry as a whole, but is simply at issue with its use of MTR and its impacts on people in mining communities. The tone of each song further supports this idea, as "Let the Mountains Roll" has quicker rhythms and a major tonality unlike "Leave Those Mountains Down," which is slower in tempo with a minor quality, creating an accusatory and dark tone. The interweaving of these nuanced perspectives into song lyrics presents these songs as deeply tied to the songwriter and his or her individual experience, as does the performance of them in the bluegrass style. Additionally, it must be noted that the residents of these coal communities do not have any one unified opinion in the coal mining debate. Varying opinions are in large supply, which makes bluegrass's ability to express a diverse array of thoughts all the more powerful and appealing to songwriters.

In addition to newer coal narratives leaning toward an environmental lens, they are also generally being told from different perspectives than when bluegrass music first began to include coal themes. As previously stated, the coal industry now employs thousands fewer miners than several decades ago, due to increased mechanization and the overall decline of the industry. Thus, nowadays, many musicians write about coal in order to present a narrative that their older family members shared with them (as is the case with several of the musicians already referenced in this article). Many of these musicians have framed their coal songs as tributes to their families and upbringings. Scott Holstein is a bluegrass musician from Huntington, West Virginia. With family employed by the coal industry for over a century, Holstein describes the inspiration behind his 2001 album, *Cold Coal Town*: "These songs have been in my head for a while now and I made a point to debut my original music to honor where I came from (so they won't forget me – and I don't forget where I came from!). The songs on the album never had to be written down – they were just there."¹⁸ Holstein's connection to coal is not one in which he was directly employed by the industry himself, but is instead a reflection of the footprints that coal has left on his family members and community.

The cultural heritage that many people have within the coal industry places them in a space where they are at odds with the reality of coal's environmental impact and the extent to which they feel connected to the coal industry for providing their fam-

ilies with jobs. This conflict is worsened by the extremely polarized nature of conversations surrounding coal, where either sides of various debates are on completely different pages and any middle ground does not appear to exist. The internal conflicts that are widely spread among those living in coal communities are a direct contradiction of many of the harshly one-dimensional stereotypes that are placed upon these residents by the rest of the country. Thus, there is even greater importance that individual perspectives are able to be expressed through various mediums, which in this case is music.

These songs offer a public presentation of perspectives that align with many activists' positions, such as the opposition to MTR. In performing shows, posting videos to YouTube, and recordings albums containing songs with this content, musicians are publicly protesting MTR at the local level. However, it is done in such a way that is presented as--and received as--art, rather than an explicitly political statement. This allows the messages to be transmitted less overtly, which may or may not be the intention of an artist in any one instance. This curbed criticism is a manifestation of internal conflict some community members feel because the coal industry provides employment and income for families in regions where there are few alternatives. Regardless, there are different layers of activism in music, where musicians can choose to present stripped-down versions of their commentary or not, and mask strong statements behind captivating melodies.

Bluegrass and activism

The purposes and spaces in which bluegrass music has been played have defined it as a tool for activism. The coal industry and its impacts on health, the environment, and its workers have provided several topics for debate on the national level, where actors from all different walks of life have weighed in. These contentious topics tend to be extremely polarized, with opposing groups framing debates in different ways. These topics include environmental regulation, workers' rights, corporations' rights, global warming, sustainability, and environmental protection. However, there are still many voices at the local community level that are often left unheard, and/or overshadowed. I will discuss how a few bluegrass musicians have used their music as a means to elevate their visibility as activists by performing at protests, rallies, and benefit concerts.

The 19th and 20th centuries saw many coal mining disasters, resulting in great losses of life. This ushered in the importance of workers' unions, through which miners would organize and seek better safety regulations, benefits, and pay. As the coal industry's lack of receptiveness to workers' requests became evident, union strikes and workers' rights protests became more commonplace. Music accompanied many of these strikes and rallies, and bluegrass in particular would provide an exceptionally powerful tool in that its cultural connections to the region established common ground among community members. This has been the case over several decades, and remains the current situation with bluegrass performers' active involvement in the current MTR debate. Music scholar Travis Stimeling describes this profound connection and use of the music: "Songs engaging with the MTR debate frequently deploy musical practices from the region's rich musical heritage, including bluegrass, gospel, and country, [...] allowing musical sounds to invoke local and regional understandings of

place, history, and regional identity.”¹⁹

Musicians have a unique way of participating in activism, in that their status as artists allows them to break down barriers that might otherwise be difficult to overcome. Elaine Purkey, a widely regarded activist and bluegrass musician from Charleston, West Virginia, recalled how she would sing and perform during miners’ protests in the 80’s. Her husband was a coal miner, as was everyone in his family. Her way of advocating for miners’ rights during strikes was to play protest music, while her husband was out on the picket lines. She describes how it was her way of contributing to the overall mission, and also how her prominence as a bluegrass musician informed others’ perceptions of her:

Music has always been a big part of my activism. The first time I organized over in Pigeon Creek, people recognized me from the radio program. I went over to the Capital to lobby, and some of those elected officials recognized me from the program and from the singing that I had done. The music was a door opener. I could get my foot in doors that other people couldn’t, because they knew me. Music has always been a big part of organizing.²⁰

Thus, her status as a bluegrass musician and performances at rallies and protests, became her way of contributing to local grassroots movements surrounding coal miners’ rights and afforded her a more powerful voice in the protests.

Bluegrass has also been used to further activists’ missions by serving as a mechanism for raising funds. Music has long functioned as a way of benefiting particular causes in this way. After natural disasters, various artists often record CDs together in order to raise money for humanitarian relief funds. Holding benefit concerts for different causes is another common way of raising money. For example, after a terrorist attack at a pop concert in Manchester, England, Ariana Grande, Miley Cyrus, Justin Bieber, and other well known musicians performed in a benefit show, ‘One Love Manchester,’ to raise money for the victims of the attack.²¹ Coal mining and its associated risks to health and the environment has motivated many such projects in the cause of fundraising.

At this juncture, it would be impossible to discuss activism and coal miners’ rights without referencing Hazel Dickens, a musician who is often referred to as the “Queen Mother of Bluegrass.” Dickens grew up in a coal mining community in Mercer County, West Virginia, in the 1940’s, where most of the men in her family were miners. This background informed her songwriting that she developed later on as a musician. Widely known as a powerful musician and activist, Dickens sang for various causes in which she was invested, including the rights of women, miners, and the poor, using her distinctive “strong and plaintive voice [that was] filled with conviction.”²² She raised money for the United Mine Workers of America (UMWA) by performing at benefit concerts, using her success as a bluegrass performer to draw light to problems within the coal industry that she had been made aware of at a young age. Her oldest brother had black lung as a result of working in the mines, which inspired, “Black Lung,” which has been described as “one of her most powerful songs.”²³

A modern example of bluegrass music’s use in activism lies within the more recent issue of MTR. The Grammy award-win-

ning country and bluegrass musician Kathy Mattea has been an integral part of the fundraising movement for “Music Saves Mountains,” an organization that aims to raise awareness about the environmental impacts caused by MTR. Mattea grew up in Cross Lane, West Virginia, with multiple family members that were coal miners and a mother who was a part of the UMWA. She has been extremely vocal in advocating for environmental protection and safe drinking water, both of which are compromised by MTR.

Mattea has come out with an entire record, *Coal* (2008), aimed at drawing attention to these issues. Speaking about the album and her inspirations to record it, Mattea said “my goal was to be able to tell this story, and maybe open up a window into it that people, who haven’t heard these songs before, hopefully they might find some accessibility there.”²⁴ Here, Mattea makes it clear that she finds the music to be a better way of reaching audiences’ consciences and attention. Additionally, some find that Mattea’s returning to her bluegrass roots for this album has resulted in one of her best works. Journalists and authors Silas House and Jason Howard described the importance of this album both in Mattea’s overall output and the large discourse of mining and personal roots: “She has not only produced what might just be her best album to date, she’s also returned in music to the home she speaks of with such eloquence, the Appalachia that she left physically when she was nineteen years old, but that she never left spiritually.”²⁵

In addition to benefit concerts, Mattea regularly gives lectures and speeches about mining and the environment, with her website advertising the dates and locations for upcoming events. Thus, it is clear that getting her message to reach people is a vital element of her activism, which given the above quote, is best done through her music. “She’ll keep fighting for Appalachia and her mountains by raising her voice in song, and in protest.”²⁶

Music has been a part of organizing since long before coal production in Appalachia. The earliest forms of protest music have been traced all the way back to the Greeks. Early examples in the U.S. include slave music that would discretely slip in themes of freedom into song lyrics without being so overt as to draw the attention of slave owners (which geographically, is not so far removed from Appalachia itself).²⁷ While music’s role in society is often to provide entertainment, this example supports the idea that music can also be very tactical in its transmission of messages. Whether one chooses to listen closely for meaning or not, music provides an outlet for ideas to be communicated in a direct way through both cognitive and emotional reception of the listener. In doing so, music about coal can gain access where other forms of protest cannot.

Conclusion

The impacts that coal mining and its industry have had on people have been told through music for over a century. The introduction of bluegrass into the life of the mountaineer, the Appalachian, the miner, carried with it a sense of regional identity. The stories and shared experiences expressed through the bluegrass style are personal because of how it invokes and reinforces one’s connection and place in a region.

Coal and mountain themes have continued as common subject matter in bluegrass tunes—albeit from different perspectives (the coal miner, the coal miner’s daughter, the community mem-

ber, the environmentalist, the homeowner, and so many more). From the 1960s onward, bluegrass focused intensely on coal miners and their daily working conditions. This included old folk songs repurposed into bluegrass style as well as songs originally composed in bluegrass style. As time went on and the mining industry began to employ fewer workers, the narrative tended to be told by children of coal miners who had heard stories from their families. Now bluegrass songs about coal reflect what is on the mind of current mining communities. In the face of MTR mining practices, many bluegrass songs delve into the environmental consequences of mining. Bluegrass music has also been used as a tool for communicating these issues of environmental injustice as well as the importance of miners' rights in protests and rallies conducted by activists in coal mining regions. In doing so, the message is spread to people outside of the region who might be in a position to support these causes.

I recently went to a concert by the Steep Canyon Rangers, a bluegrass band born out of Chapel Hill, North Carolina, recipients of both IBMA and Grammy awards, and now based out of Asheville. About halfway through their set, they started playing a hauntingly beautiful song sung from the perspective of a coal miner. The audience reacted with a noticeable hush and increase in attention. From stage, the Steep Canyon Rangers made no comments to personalize the song or claim that it was about a relative. And yet, I was struck by how the storytelling of coal's impact on people and land had transgressed geographically and culturally, such that it evoked a personal and connected response even in the formal concert hall on UNC Chapel Hill's campus, hundreds of miles from the nearest mining community, with an audience that had few immediate family members who would have ever worked as miners and a sense of distance from social class. This moment of performance highlighted the power of the coal mining narrative in the sonic context of bluegrass, having spread within a genre of music to diverse audiences in such a compelling way. As long as the mountains of Appalachia entrap the coal that is both a symbol of heritage and its source of environmental destruction, bluegrass is there to tell its many multifaceted stories.

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Dance Dance . . . Evolution?: The Manipulation of the Female Narrative in Kathakby

by Sachi Pathak

This paper investigates the complex evolutionary patterns of *tawa'if* culture from female courtesans working colonial India to present-day, transnational interpretations of kathak, an Indian 'classical' dance style. Furthermore, this paper recognizes the shifting narratives from female to male dominated dance lineages promoted by both men and women in the kathak dance sphere. New interpretations influenced the way kathak was represented across multi-media platforms through 20th and 21st Century Bollywood along with reality television in the United States. Prior to the introduction of the British Raj in India, *tawa'ifs* were seen as powerful women with a specialized education in the arts. However, the introduction of colonialism altered the interpretation of courtesan culture and equated it to prostitution. This paper details kathak's pendulous nature from pre-colonial courtesan culture to 21st Century Indian and American media.

Keywords: traditional dance, female narrative, Bollywood

The first time I watched *So You Think You Can Dance* was during its 9th season. The reality TV series begins with a highly selective and competitive audition process, followed by a series of fast-paced workshops during "Vegas Week," during which time admitted dancers learn a variety of duets in a short amount of time and perform for the judges with the hopes of being selected for the Top 20. The selected dancers are then sent to Los Angeles where they perform for a live audience. Each week, viewers vote for their favorite dancers to keep them on the stage. The dancer with the lowest vote count is voted off and the remaining dancers perform a new routine the following week.

I found myself watching a Bollywood piece choreographed by Nakul Dev Mahajan, a seemingly popular choreographer for the reality TV show. Nakul Dev Mahajan, the reality show's designated Bollywood dance choreographer and founder of Bollywood Dance School in the U.S., is a classically trained dancer in traditional Indian dance. He was trained by Vandana Sheth and Purnima Shah in kathak specifically, and also has an array of dance training for various forms of dance including modern and Bharatanatyam.¹ During the course of the show, the audience receives a brief synopsis of the dancers' experience learning that week's choreography. The video often reveals comical moments between the dancers, comments about the choreography, and the enjoyment they experience while learning the piece they are pre-

paring. In this episode, Mahajan also shares his experience with dancers, Chehon Wespi- Tschopp and Witney Carson. Chehon is a skilled ballet dancer, and Witney has extensive training in ballroom and Latin dance. However, these dancers are paired in order to learn and perform a Bollywood fusion piece under Mahajan's direction. In their video Chehon and Witney stress to the audience the intricacies of the mudras, or gestures they must quickly learn along with the heavily technical movements that Mahajan was teaching. These gestures are outside the realm of their training. Mahajan also expressed concern in his students' ability to learn these gestures, which are partially grounded in Bollywood dance and partially grounded in kathak, the Indian 'classical' dance style that will be the focus of this paper. The interview revealed that Mahajan neglected to teach his students the kathak vocabulary associated with technical elements of the dance, including terminology of hand gestures and body positions. For example, when Witney formed the Indian dance mudra, *ham-sasyam*, with her hands she explained her difficulty learning "the deer." I wondered why teaching the mudras' terminology was not included in that week's curriculum for the dancers? Did Mahajan deem this element of training as unimportant?

Following the interview, as the initial few seconds of the music track played and the dancers were in position, the title of the song appeared in the bottom left corner: *Tandav Music*. I was very ex-

cited to see this title and I thought the technical dance vocabulary would be heavily emphasized through the dance piece. To my disappointment, I saw two contrasting narratives develop on stage over the course of the dance piece: one of the traditional kathak and another that showcased various disciplines of dance to appeal to a transnational, non-South Asian audience.

Musically, I heard syllables that narrate the footwork of a kathak dancer and the amalgamation of bols, or rhythmic syllables that ended in sum, the first beat of a repeated 16-beat cycle. In his choreography for the two dancers, Mahajan also incorporated the practice of a jugalbandi, or alternating duet between two kathak dancers as the bols continued during the Tandav Music. Beyond these superficial elements, the embodiment of the Tandav Music was unlike anything I had heard from my years of training in kathak. To add to that, the costume did not match the contemporary image of the kathak dancer I had envisioned my whole life. Witney's midriff was exposed and both Witney and Chehon's ankles were bare, with no sign of ghungrus, or ankle bells. As the tablas, or traditional North Indian drums, continued to play in the background, new instruments pertaining to various transnational artistic currents were introduced on the soundtrack and new stylistic additions were revealed on stage. The dancers performed turns on the balls of their feet at the end of the piece, but not chakars, or heel spins in which the dancer spins "like a top"² and ignored any abhinaya or "expression of sentiment through acting and gesticulation"³ that would traditionally go with a tandav, such as Krodha (anger) or Trasa (alarm).⁴ Yet the audience cheered on and gave a standing ovation at the end.

After the dance piece was over, the judges began their critique for Chehon and Witney. Mary Murphy, a well-known ballroom dancer, and Adam Shankman provided extremely positive feedback for Chehon and Witney, and Mary even gave them her iconic scream for a job-well-done. When judge Nigel Lythgoe provided his feedback to the dancers after their Bollywood performance, he confirmed with Mahajan the strong influence of kathak in his choreography. Host Cat Deeley asked what Lythgoe was referring to, and Lythgoe defined kathak as, "when it goes into the rhythm of..." followed by a random percussive noise and accompanied by hand gestures that mocked the traditional mudras present in classical Indian dance.⁵ His arguably flippant comment was well received by the audience with a hearty laughter. It was in that moment that I realized how severely misunderstood and misrepresented kathak is within American reality shows, which use an amalgamation of kathak and Bollywood dance to appeal to a naïve audience in order to get votes and move on to the next week of choreography. While Bollywood dance caters to the masses, it undercuts its foundational elements of classical dance and transforms the image of Indian dance.

What is Kathak?

Kathak is classified as one of the many classical Indian dance styles of India. This dance form predominantly resides in North India, but overtime it has influenced dance tradition transnationally, as I will explain throughout my discussion of kathak's exceedingly dynamic narrative. To understand this narrative, I will demonstrate what technical elements the dancer presents on stage. Margaret Walker describes the progression of a typical kathak performance. It begins with a vandana or prayer piece that evokes images to portray various deities. The vandana is

followed by a slow-paced *thaat*. In the technical portion of the performance, the dancer showcases *aamad*, *paran*, and *gat*. These technical feats, including *chakars* and *footwork*, are conducted at various speeds in 4/4 time, beginning at the slowest tempo called *vilambit lay* through *madhya lay*, or medium tempo, and finally dancing in *drut lay* which is the fast tempo. The *gat* can also include *bhav* or emotive facial expressions. *Bhav* or *abhinaya* are incorporated in *kavitas* or poems which often reflect the brief narratives within Hindu epics. *Abhinaya* is also used in the *thumri* or dance-songs.⁶

Kathak, derived from the Sanskrit word *katha* meaning story, describes not only the dance form, but also the dancers themselves.⁷ According to Margaret Walker, "there is another trope stating that the Kathaks (the people) are by definition kathak (the dance)" indicating minor distinction between the dancers and their movement. I will use this terminology throughout my paper, differentiating between Kathak and kathak.⁸ This dance style emphasizes rhythm and footwork as well as *abhinaya* to allow a Kathak to demonstrate often a religious storyline along with his movements. Using a stylized turn, or *palta* (meaning switch), the dancer has the ability to change embodied personas in order to facilitate telling a story of multiple characters.⁹ However, kathak is more than *paltas* and *abhinaya* and has a very complex history that is filled with a variety of conflicting narratives leading up through the 21st century. According to Gina Lalli, the focus of kathak through courtesan culture emphasized "lyrical pure dance designs, virtuosi footwork, and sensuous expressions of love themes" due to the patronage of rulers from Mughal courts.¹⁰

In this paper, I aim to trace the shift in kathak from female, courtesan culture to a male-dominated, *gharana*-oriented dance style, and finally back to a sexualized and decentralized form of kathak. I claim that these stylistic shifts were a product of the British Raj, and that kathak has continued to deviate from its technical strengths and female-oriented foundation through various forms of political influences and media. These social influences resulted in the invocation of globalization. In my discussion, I adapt Janet O'Shea's interpretation of globalization to think about kathak "not as a ritual activity associated with temples and courts but as an urban, global art, crosscut by concerns of local, regional, and national identities."¹¹ These identities include a variety of historical forces, such as the British Raj and its imposition in the Indian society, figures of the anti-nautch movement, American choreographers, and the Bollywood movie industry. Over the course of my research, I aim to deconstruct these conflicting narratives and reveal how they compromised courtesan culture along with other female narratives in kathak.

Historical Background

Tawa'if Culture

In order to discuss the shifting narratives of kathak due to the forces of colonialism and globalization, I will first explain the preexisting kathak scene present in India prior to the introduction of the British Raj. Walker states,

Before the twentieth century, professional female performers in India were, by and large, from hereditary classes and castes that occupied a liminal position in society, combining music and dance with some aspect of the sex trade. These hereditary groups formed an ar-

ray of specialist communities ranging from street performers to temple women, called devadāsīs, and highly skilled courtesans known as tawa'ifs or bājīs. Far from a homogeneous group, the women came from various communities, some of which were lineages of female performers and others which were groups containing entertainers of both sexes. Women therefore performed in a variety of artistic specialties and performance contexts, each having a place in the existing social hierarchies at a given time.¹²

Tawa'ifs were trained experts in music and dance and held a high position before and during the colonial period, as they owned land and property through a female lineage. This was atypical of other women during this time.¹³ The tawa'if is parallel to devadasi women, or “courtesans affiliated with temples and courts as performers and ritual officiants” as well, indicating that the courtesan culture was present in various parts of India and in different dance narratives.¹⁴ Tawa'ifs fell into four main categories. According to kathak scholar Pallabi Chakravorty, “the bais sang but did not dance, the jans sang and danced, the kanjis entertained and, the lowest in the hierarchy, the khankis were more like the common prostitutes.”¹⁵ Today, Bollywood media homogenizes these four distinct groups in order to create a single exotic image of the tawa'if and more broadly of kathak dance, as discussed later on in my research.

In the 19th and 20th Centuries, tawa'if culture began to dissolve, obscured by three main forces: the introduction of the gharana, the implementation of the British Raj, and expansion of mainstream Bollywood media. The gharana, or dance lineage passed on from guru to student, acted as a “bloodline or long-time association that fostered a particular [dance] style.”¹⁶ However, this form of categorization of kathak lineage created a male-centric narrative and hid any trace of the tawa'if culture. The trajectory of devadasi women parallels that of the tawa'ifs as Avanti Meduri indicates, “the devadasi was transformed almost completely into an object, valued only as the repository of the ancient tradition she had mastered – as its symbol. In this we see the first signs of the split that society initiated.”¹⁷ In the case of kathak, this split divided the tawa'if from the male Kathaks, and also casted out the female hereditary dancers from the dominant kathak narrative. As a result, the tawa'if became objectified as a symbol of the past that no longer concerned the incoming gharana-oriented kathak. Furthermore, Chakravorty asserts, “For kathak, [gharanas] also meant that male performers could be traced back to the brahman kathakas, while female performers such as the courtesans and male musicians such as the mirasis were purged from genealogical lineages and authority.”¹⁸ This deletion of the female narrative was integrated into 20th century dance institutions in addition to the gharanas as they became widespread across India. For example, Leila Sokhey, also known by her popular stage name Madame Menaka, was a “dance pioneer” who steered away from any personal association with the tawa'if culture, in a manner similar to Rukmini Arundale of Bharatanatyam.¹⁹ During her personal career in the 1930s, Sokhey kept her distance from any solo performance as “any solo women performers were from tawa'if lineages and the ‘classical’ solo dance traditions were still emergent.”²⁰ Furthermore, Sokhey consciously attempted to avoid any relation to the tawa'if culture as she built her dance troupe. The persistent

stigmatization of the tawa'if caused for a shift in institutionalized kathak schools. Walker explains,

...the descendants of tawa'ifs were not welcome in Sokhey's dance troupe nor invited to teach at her school. This reinforced the shift in authority already taking place as the male participants in the tradition, the hereditary Kathaks, became the dance's owners and disseminators... Thus, although significant items from tawa'if performance practice remained part of kathak dance, those elements were gentrified physically and thematically.²¹

It is evident that the removal of all female-associated history was to legitimize these schools and deviate from any sexual undertones that kathak may have carried. Furthermore, Sokhey's disciples, namely Damayanti Joshi altered the solo culture of kathak dance to steer away from tawa'if dance style and to emphasize the tradition of male kathak artists as a way of legitimizing kathak with a varying approach.²² The choice to neglect the courtesan history of kathak also feeds into the implementation of the gharana and elevates the male technical pieces by devaluing the female tawa'if tradition. Therefore, the new form of legitimacy relied on eliminating any ties to the female, tawa'if narrative. For example, Sokhey steered away from including dance in the seated position due to its strong ties with courtesan culture. Walker states,

To the best of our knowledge, in a typical late-nineteenth-century performance, the female performer initially sang while seated and enhanced her vocal performance with expressive gestures. She could improvise on any phrase, repeating certain words and lines of poetry while using gestures and eye contact to draw attention to the layers of suggestive meanings.²³

Despite the practical reasons for the tawa'ifs choice to remain seated as she performed vocally, Sokhey found her gait to be hypersexualized and denounced this practice in her institution. So, although this dance troupe was created by a woman for female dancers, Sokhey's choices to eliminate dance from a seated position and other forms of abhinaya perpetuates the stigmatization against female dancers and re-writes and redirects the validity of kathak tradition by emphasizing male tradition and erasing any female tradition. This extends beyond elimination of certain dance styles as the institutionalization of kathak altered the use of traditional kathak garb as well. Walker explains, “As the tawa'ifs' characteristic layers of veils and other ‘drapery’ were not worn by either male or female dancers [institutionally, that is], many gestures became mimetic.”²⁴ Replacing traditional tawa'if garb with gestures demonstrates that the initial dancers of kathak wore costumes often to convey a seductive message to their audience based on courtesan culture. Yet overtime, as male dancers took over the dance narrative, these costume components diminished and were replaced through the use of emotive facial expressions, namely bhavas and abhinaya. This tactic to overshadow the female tawa'if narrative caused current dance students to assume they are learning what the great male dancers learned, thus ignoring the female history of the dance form.²⁵ The way in which dance institutions hide the courtesan history and promote the male-based gharana shows how kathak dancers and teachers attempt to hide the female narrative instead of showcasing it, in-

stilling a bias against women and allowing for the male narrative to take precedence, erasing the female narrative altogether. The driving forces behind these historical assumptions of courtesan culture rests on the imposition of the British Raj, nautch culture and the anti-nautch movement.

Upon the arrival and settlement of the British, Calcutta primarily became a hub for kathak in order to entertain the newly established British rulers.²⁶ As a result, kathak became an inlet for the British Raj to place its notions about the Indian culture and its dance practices. Kathak was commodified and generalized into a broader category of nautch, derived from the word “naach” meaning dance in Hindi in order to refer to Indian dancers. Women who were a part of these dance troupes were referred to as nautch girls.²⁷ As earlier mentioned, these women were educated and literate, unlike many other women of that period.²⁸ Evidently, the British population had little to no understanding of the rigorous training process involved in their so-called nautch, thus enhancing the impact of globalization on kathak. In other words, kathak was subjected to judgement from another cultural background and modified. New terms were made to refer to kathak as a homogenized class of dance. Furthermore, Indian political figures of the Bengali high society aimed to impress British guests through the use of ornate parties and nautch performances. As Judith Lynne Hanna states, up until 1912-1913, “girls could be purchased for 2,000 rupees each. The imperialist hold economically weakened the Indian rulers who patronized the dancers.”²⁹ Therefore, not only did the British Raj bring about the creation of a new British narrative, but the Indian society perpetuated this narrative that patronized kathak despite the loss they would incur. Once again, the female kathak dancers’ narrative was removed and allowed for white and Indian men of high social standing to commodify kathak dance.

The impact of globalization is obvious, as the British Raj misunderstood kathak and the surrounding Indian culture. The British Raj urbanized kathak as white men imposed their own predispositions of what is acceptable in society and what is not, thus altering the value placed on classical Indian dance and using it as a means for pleasure for white men and shame against Indian society. Gayatri Spivak alludes a similar discourse in the context of debates around sati, or widow immolation in colonial India. When discussing the figure of the sati, Spivak famously states, “If in the context of colonial production, the subaltern has no history and cannot speak, the subaltern as female is even more deeply in shadow.”³⁰ In both the case of sati and the tawa’if, the female is used as the grounds for discourse, but is unable to speak for herself as political figures of the British Raj reconstruct the female narrative. However, white men were not the only ones to act upon the othering effect of racial disparity. Paintings were one of the preliminary forms of media that offers insight on the derogatory representation of tawa’if culture.

White men were not the only ones to act upon the othering effect of racial disparity. Paintings were one of the preliminary forms of media that offers insight on the derogatory representation of tawa’if culture. S.C. Belnos, a British artist, illustrated a variety of images depicting the lives of Hindus from various social classes. One piece in particular, called “A Nautch Girl or public female singer of India” (c. 1832), found in an art collection from Columbia University demonstrates how the British Raj transformed the perception of kathak.³¹ On the left half of the

painting, two British men and presumably their female counterparts watch as a nautch girl, likely a bai or jan, sings and/or dances on the floor using classical gestures. The white men are shown to be standing and talking amongst themselves while watching her perform. In this image, racial and sexual privileges are obviously highlighted as the British men are standing taller while the British women are seated, but both are wearing elegant attire. Yet, on the right side of the image seated on the floor to entertain, the nautch girl looks up at them as she performs. She wears traditional and simplistic clothing, demonstrating her lower social status in comparison to the British figures. Other Indian women sit behind her wearing simple clothing as well, initiating an “othering” effect as white and non-white are segregated in the image through both clothing and seating position. Soon after nautch was popularized by British politicians, the anti-nautch movement gained traction and altered the female narrative of kathak dancers.

At the turn of the century, British rulers felt that nautch resembled prostitution. However, this anti-nautch movement, and more importantly the British lens neglected to recognize the skill required to perform this technical dance form. Instead, tawa’ifs transformed their presentation style to cater to a new audience which focused on musical talent.³² Ironically, it was the British rule that reduced kathak to a generalized form of dance or naach, making it easier to label kathak as a form of prostitution when white men perpetuated that narrative. As such, kathak was manipulated and viewed as a threat by the British Raj for two main reasons. First, political and military figures “sought to make them [nautch girls] an inexpensive answer to the sexual needs of single European soldiers by insisting on clinical standards of personal hygiene.”³³ In essence, kathak dancers were used as a scapegoat for white men who were unable to control their sexual desire, thus reducing the labor of a nautch girl and altering the narrative once more to focus on the importance of the white male at the expense of trained, female hereditary dancers. Second, the religious connection to kathak was disagreeable to Christian religious traditions,



which was the religious background of many in the British Raj. Devadasis would perform for god, and had a unique relationship with god in which they would engage in temple dancing. In the

same vein, devadasis of colonial South India also participated in temple processions, but like the tawa’if, these women also had courtly repertoire and performed at weddings and salons as well.³⁴ However, the fixation on temple dancing resulted in its prohibition as deemed by British male rulers. While in Hinduism, “sexual ecstasy is a path to spirituality” this went against the Christian school of thought with respect to sexual relations.³⁵ Additionally, the misunderstood work of the courtesan resulted in the dissolution of her narrative. If these other forms of work were more emphasized, political figures of the British Raj may have allowed for the courtesan narrative to continue. This cultural disconnect

caused forces of colonialism to act on Hindu tradition and kathak dance in order to exoticize and devalue these Indian traditions. While completely acceptable within the Indian context, temple/salon/court dancing in addition to wedding performances and the Indian female narrative was altered to satisfy the British perspective. The alteration in dance narrative also speaks to the varying levels of privilege, where white men drive the narrative and women must act accordingly. The anti-nautch movement reduced nautch girls to become corporeal outlets for the white man, and also created a racial and socioeconomic divide as Belnos depicts in her painting.

Transcultural Appropriation of Nautch

Nautch culture did not remain within the Indian borders, but traveled internationally to the United States. Through new perspectives and interpretations of classical Indian dance, kathak along with other styles were manipulated and globalization began to occur within the dance sphere as kathak traveled to North America. In this new setting, Indian classical dance piqued the interest of dance artists/choreographers like Ruth St. Denis, “one of the three ‘foremothers’ of American modern dance.”³⁶ According to Chakravorty, Ruth St. Denis “helped elevate Kathak to a respectable classical status” in the early 20th Century.³⁷ Adding to this, scholar of Indian dance and music, Matthew Harp Allen states,

As her career evolved St. Denis picked up a like-minded partner, and together they assiduously cultivated the personae of “divine dancers” in an extremely heterodox performing environment, moving between vaudeville and more “legitimate” venues, crisscrossing the United States, Europe, and Asia. Their voracious interest in world dance traditions would lead to choreography of cross-cultural impressions ranging from Egyptian Ballet (1922) to Cuadro Flamenco (1923) to Ishtar of the Seven Gates (1923) to A Legend of Pelee (1925) to General Wu Says Farewell to his Wife (1926).³⁸

Allen’s indication of St. Denis’s travels indicates the momentum she gained from her inspiration of the South Asian dance culture. However more importantly, St. Denis renewed the female narrative in the American context. While figures like Leila Sokhey attempted to eliminate the tawa’if culture from becoming institutionalized in her dance troupe, Ruth St. Denis took a different approach that helped with a sort of revival of classical Indian dance. For example, her piece Radha was inspired by “an orientalist poster advertising cigarettes depicting ‘Egyptian deities’” along with a performance she witnessed in Coney Island, Durbar of Delhi³⁹ and a performance by Bachwa Jan, prominent nautch dancer in Calcutta.⁴⁰ These interactions came from a genuine curiosity, albeit a skewed understanding of classical Indian dance, despite the discouraging feedback St. Denis received initially.⁴¹ Matthew Harp Allen cites her St. Denis’s autobiography regarding her choreographic inspiration upon seeing “snake charmers and holy men and Nautch dancers, and something of the remarkable fascination of India caught hold of me.”⁴² I acknowledge that Ruth St. Denis’s inspiration from “The Orient” is cultural appropriation, or a form of Orientalism, as she places a white woman in Indian clothing to pose as Radha. However, the

choreographic liberties she took allowed the female narrative to supersede the preceding patriarchal dominance, unlike the approach Leila Sokhey took which perpetuated gender bias within the Indian dance context. St. Denis used the Indian female narrative to recreate her own female narrative in the context of modern dance in North America. That is, by seeing women (as opposed to men) perform in Coney Island and in Calcutta, St. Denis was able to enter the Indian dance sphere and gain insight on how women trained and knowledgeable in kathak performed. So, as men used this opportunity to formulate the Lucknow, Jaipur and Benaras gharanas and devalue tawa’ifs, St. Denis revitalized tawa’if culture by restoring its credibility and basing a new approach to kathak off of tawa’if practice. Furthermore, her interactions with Bachwa Jan renewed St. Denis’s impression of Indian dance from a romanticized and exotic art to a more realistic depiction of street performers.⁴³ Notably, she did use her art to exoticize kathak and the Indian culture, including an aspect of the Indian religion by calling her piece Radha. However, this form of globalization resulted in a productive manipulation of kathak in which the minds behind American, modern dance were exposed to a new source of creative energy and formed a newly inspired product to entertain the American public. The perception of Indian dance was skewed due to her cultural appropriation, but St. Denis increased the credibility of tawa’if culture by learning from the source herself and enhancing the female narrative in the American, modern dance context.

Bollywood Media’s Representation of Kathak

Bollywood Shift for Mass Appeal

As media became more mainstream, kathak was once again redirected to become an act of sexuality. The Indian cinematic industry “Bollywood” attempted to globalize kathak along with other classical dance styles in order to reach a broader audience and gain more monetary benefit in some cases. For the purposes of my research, I will focus on the alteration of kathak specifically in Indian film. Bollywood successfully formulated changes in an interesting way, as identified by Neelam Sidhar Wright. Based off Madhav Prasad’s claims, Wright states,

‘Bollywood’ is an important indicator of change within the Indian film industry, specifically in terms of contemporary Indian cinema’s increased bilingualism, its internationally educated directors, its shifting notions of Indian identity via globalisation, its textual struggles and contradictions on the level of representation, its increased commoditisation as a ‘fetish object’..., and, most importantly of all, its now inherent self-referential exploitation as a global brand.⁴⁴

Wright demonstrates that Bollywood uses commercial tactics like the use of multiple languages and a diverse group of directors to gain credibility. This attempt at globalization results in the misrepresentation of the female when portraying classical Indian dance, which is considered to be an intrinsic part of the national Indian identity.⁴⁵ In order to appeal to the masses, Bollywood used tactics to sexualize, exotify, fetishize women. These tactics seemingly function as a reaction to the anti-nautch movement in the 20th century and continues into the 21st century as well, in which Kathak swings back and forth between courtesan culture

that is sexualized and anti-naught culture that prescribes technical features and male-led narratives. Furthermore, the industry takes advantage of the male narrative to legitimize the portrayal of kathak on-screen, and emphasizing prostitution that surrounded courtesan culture, which was perpetuated by the British Raj. This cultural gap from the colonial period still takes effect in movies from the late 20th and early 21st centuries like *Umrao Jaan* and *Devdas*.

The commercialization of kathak through media was a difficult transition for trained kathak dancers and caused a lot of financial strain on classical dance artists. Chakravorty describes Bandana Sen's involvement in the film industry through her involvement in mythological movies including the *Shakuntala* and *Ramayana* during the late 20th century, and reports that "the vigour of Kathak had also been lost due to the lightfooted showmanship that has become so popular now."⁴⁶ It is evident that globalization altered the representation of the Indian identity to satisfy the masses, leaving behind the trained dancers and their knowledge in the arts. While Sen is shown to keep her roots intact, choreographers in an increasingly mainstream Bollywood film industry have deviated from traditional dance and emphasized exotic narratives to reach a broader audience.

20th Century Bollywood

During the 20th century, Bollywood began to commodify dance through mythological movies relating to Hindu epics as well as other movies that still contained religious connection to figures such as Radha and Krishna. Based on the work of Philip Lutgendorf, 20th century Bollywood promoted mythological productions as a large part of the movie industry.⁴⁷ Neelam Sidhar Wright refers to the movies from the 1960s to the 1980s as "masala entertainment" as a critique to its quality.⁴⁸ During this time, a wave of globalization altered the view of kathak dance, beginning with pieces of art and slowly transitioning to other modes of expression with technological advances. Due to variant forms of media, including Bollywood as well as competitive dance shows in America, the Indian film industry transformed kathak from a mode of knowledge and expertise into a popularized form of traditional technique/movement solely for entertainment purposes. Between 1955 (promptly after India gained its independence from British rule in 1947) and 2015, the Indian film industry Bollywood has altered this traditional dance by incorporating sexual undertones in gesture and costume, further exoticizing kathak and continuing the British legacy of naught.

In the movie *Jhanak Jhanak Payal Baaje* (1955), the central focus is set around Girdhar and Neela, two kathak dancers who are very talented. Over time, the movie shows these dancers falling in love. Neela sacrifices herself and leaves her guru so that Girdhar can pursue his dance career. Hearts are broken, relationships are mended, and in the end, Neela and Girdhar dance together in a culminating performance winning them the competition and bringing the couple closer together and more in love. It is evident through the various dance pieces in the movie that a religious iteration of kathak dance serves to bring the protagonists together. As they dance in the item song *Murli Manohar*, they adopt the roles of Radha and Krishna and perform together as they begin to fall in love.⁴⁹ Neela and Girdhar dress accordingly and share the story of Radha-Krishna's playful, innocent relationship. As such, a religious association of dance and media remains intact in the early stages of globalization, despite the threat reli-

gion and dance caused against the British Raj. However, *Jhanak Jhanak Payal Baaje* utilizes kathak as a mode for two dancers to find a more romantic love, as Neela holds Girdhar for longer than the choreography permits and captures her gaze for too long. By focusing the movie's storyline on love, the movie is able to reach a broader audience. In this way, *Jhanak Jhanak Payal Baaje* does not become exclusive to those who are familiar with classical Indian dance, but rather assumes a universal approach. This attempt to broaden the audience scope emphasizes the impact of globalization as kathak is manipulated by media to primarily portray love as opposed to technical elements like abhinaya. In turn, this movie had the potential to reach wider populations. This effort towards expansion recapitulates the British discourses in which kathak merely becomes naught, a generalized form of Indian dance rather than emphasizing the years of technical training that goes into gaining expertise. However, this is just the beginning of Bollywood's movement to globalize Indian dance, as this movie still frames itself around two trained kathak dancers. As Bollywood produces more movies well into the twentieth century, these kathak narratives shift and reveal more exotic and male-heavy narratives.

As an example of the shift in Bollywood, we can turn to the song *In ankho ki masti* in the movie *Umrao Jaan* (1981), a film directed by Muzaffir Ali.⁵⁰ In the song/dance *In ankho ki masti*, Chakravorty argues that the dancer (and lead character), *Umrao Jaan*, performs only for Sultan Sahib, thus rendering her as an "erotic spectacle."⁵¹ By drawing attention to this interaction, it is evident that the sexualization of *Umrao Jaan* skews viewers' comprehension of tawa'if culture and alters the female narrative in a derogatory manner. The movie frames the tawa'if as a woman available to please her male counterpart, but does not showcase the knowledge she possesses in the arts. As a jan, she possesses skill in dance and music, yet the director focuses on other corporeal aspects that retract from that expertise. As Chakravorty observes, Ali includes many close-ups of the dancer's face and eyes as well as Sultan Sahib's reactions to her dance which inherently puts more value on her feminine qualities as she dances.⁵² The camera work promotes the interaction between Sultan Sahib and *Umrao Jaan* in order to please a broad audience, not exclusively those versed in classical Indian dance. So, while the story does include a court setting, the context is still highly sexualized to promote the corporeal elements of the dancer rather than her technical merit. This exemplifies Bollywood's efforts to promote globalization as the camera focuses on very pointed and suggestive parts of the dancer's body. This focus perverts the viewers' perception of *Umrao Jaan* by allowing a male director to guide the camera, thus invalidating the female narrative and subjecting it to sexual framework instead. These scenes from the movie, specifically in the song, distort the viewers' understanding of what kathak used to look like within the tawa'if culture and misrepresents it to show a form of seduction, not skill. By redirecting viewers' attention to the sexual undertones of tawa'if culture, the dancer is not recognized for her merit, but instead marked for suggestive gestures.

21st Century Bollywood

Based on the analysis of Ajay Gehlawat, 21st century Bollywood can be characterized based on its use of "transnational and digitized articulations" of cinema.⁵³ In the 21st century, the focus was removed from mythologicals. Rather, kathak was used

in tandem with 21st century trends and digital effects. We see evidence of these articulations in movies like *Devdas* and *Bajirao Mastani*. Iconic dancer and actress Madhuri Dixit plays Chandramukhi, a courtesan in the movie *Devdas* (2002). Chandramukhi is beautiful, charming, seductive, and well-versed in kathak. The song *Kahe Chhed Mohe*⁵⁴ begins with her backup dancers demonstrating technical components to kathak, staying true to the minimalist nature of kathak.⁵⁵ It is evident that this piece portrays kathak based on the initial *jati*, or composition of bols that is staged, showcasing technical elements and stylized movements as well as costume design typical of kathak dance. As Dixit is portrayed singing and dancing, she is likely playing the role of a *jan*.⁵⁶ However, she dances in an ornate costume filled with sequins and jewels, unlike the typical garb of kathak dance.⁵⁷ Chandramukhi spends much of her time flirting with and pestering lovesick *Devdas*, the main character who visits her brothel. In song, she mentions how Krishna kissed her face, and the camera shows a close up of Chandramukhi's face as she interacts suggestively with her audience, namely *Devdas*. Within the misnomer of kathak, Chandramukhi uses suggestive gestures outside of the realm of traditional kathak dance, adhering more to the Bollywood dance genre. It is evident that allusions to Hinduism to tell a story are subtly shown in the background with the lyrical invocation of Krishna, but these allusions ultimately bear little weight in comparison to the provocative, Bollywood dance motions that Dixit executes. As director Bhansali attempts to attract a wider scope of audiences, the industry has evolved to incorporate more suggestive dance, but uses the misnomer of kathak by casting renowned kathak dancer and Bollywood actress Madhuri Dixit in this movie and this dance in particular. Bollywood dance emerges from the juxtaposition of various disciplines, a point that is clearly evident in the song *Kahe Chhed Mohe*.

Chakravorty generally describes the Bollywood dance genre to include “an eclectic blend of rap, disco, break, Indian folk and classical genres.”⁵⁸ The fusion of traditional elements of classical Indian dance with ‘westernized’ steps and utilizing an “Indian flair” allows the Bollywood industry to once again promote globalization. The cinematic industry manipulates kathak to showcase *tawa'if* or courtesan culture within the context of a brothel in the movie, but focuses more on the corporeal and sexual elements of a misunderstood courtesan culture, and retracts the importance of the female narrative by using it to appeal to men. In turn, this undercuts the focus from the technical components of kathak and perverts the dance form as a whole, as Bollywood dance bends the more stringent rules present in kathak. The concept of Bollywood dance is further explicated later on and bears much more relevance in the Western context.

Bajirao Mastani (2015), a romance and period piece incorporates kathak in one of its iconic songs, *Mohe Rang Do Laal* (Color Me Red).⁵⁹ The song begins with a bird's-eye view of a luxurious garden and pavilion. Despite the time period of the story, these effects allude to the cinematic liberties taken in 21st century media. In the song, playback singer Shreya Goshal sings using words with double meanings. These verses are interspersed throughout the song and provide complexity that is mimicked in the technical aspect of the dance. She sings, *mohe rang do laal, nand ke laal laal, chhedo nahi bas rang do laal*, meaning “color me red, Nand's son, don't tease me just color me red.” In this stanza, the word *laal* means both “red” as well as “son.” Later on, she sings,

hari ye chunariya jo jhatke se cheenii, which means “Hari seized this green sash with a jolt” denoting the playful relationship between her and Krishna as the deity tugs at her green sash. In both cases, the song alludes to religious element in both the Hindu and Islamic context. The word “*hari*” refers not only to Krishna, but also to the color green. Red is an auspicious color symbolizing purity and is often worn by Hindu brides, and green is an auspicious color for Islam as it is associated with the heavens. By using the color green, subtle undertones of Islamic culture are incorporated into the lyrics and are further juxtaposed with a Hindu deity. While these religious undertones do align with the religious negotiations present in the plot, the director focuses on different aspects of her performance, indicating that Bollywood is less interested in the technical strengths of a kathak piece and focuses on sexual encounters. In order to perform this “kathak” piece as Princess Mastani, actor Deepika Padukone was trained under renowned dancer Pandit Birju Maharaj of the Lucknow gharana. Yet there are clear elements of Padukone's performance that deviate from this style of kathak. For example, Padukone's costume did not match the typical Lucknow gharana style. According to Gina Lalli, a kathak dancer can dress in the Mughal or Rajput garb. She says,

The Moghul costume consists of a coat having long, fitted sleeves that is fitted to the waist, and is extremely full and flaring from waist to knee. With this coat are worn tight-fitting trousers. In the Rajput mode, a man may wear a dhoti (a cloth wrapped around the waist and legs to resemble pajamas) with no upper garment, but with elaborate necklaces, bracelets, and arm bands. A woman may wear a variety of long, flaring skirts with fitted trousers and a choli (a short, tight-fitting blouse), and a scarf draped over the left shoulder, tied at the waist. Jeweled earrings, necklaces, bangles, and rings will be added according to taste. Alternate costumes for female Kathak dancers consist of a long, flaring coat or a six-yard sari, draped to look like pajamas. The costumes are richly ornamented and are made of bright colored silk or cotton with gold-embroidered designs.⁶⁰

However, Padukone is dressed in a costume more revealing than the traditional kathak apparel of the Lucknow gharana, as her midriff is shown instead of being covered with her scarf. She wears a blouse ending above the waist with the *odhni* or sash covering only part of her torso, although she would traditionally wear the *odhni* pinned to cover her chest and midriff. Furthermore, costume designer Anju Modi did not include any necklace to accompany her costume, leaving the chest and the plunging neckline of her blouse exposed. This choice draws a focus on her bare chest and invokes a sexualized allure as she performs for the royal visiting guest, *Bajirao*. The camera closes in on her eyes and lips, and often insinuates her seducing *Bajirao* as she has fallen in love with him. Behind Princess Mastani, a group of backup dancers wear relatively modest, green costumes, showing more technical kathak elements of the Lucknow gharana discipline. The presence of the backup dancers creates the perception of excess, which contrasts the minimalist approach to kathak.⁶¹ Furthermore, since kathak has a longstanding solo tradition the backup dancers also refract the image of kathak and deviate from

this tradition.⁶² These components are all an amalgamation of distractions that take away from the technical strengths of kathak and instead hone in on the Bollywood dance genre through the use of female eroticism. Furthermore, the influence of Pandit Birju Maharaj emphasizes the omnipotence of the male narrative through the gharana. In the first few moments of the song, Padukone assumes the seated position, similar to the performance of a courtesan dancer.⁶³ However, the backup dancers continue to showcase a variation of a jati along with abhinaya that complements Padukone's central choreography. The duality of courtesan culture and the male-led gharana is clearly showcased in the beginning of the song, but Padukone quickly joins the backup dancers by rising to an upright, standing position to perform the bulk of Pandit Birju Maharaj's choreography, leaving the courtesan-based tradition behind. In an interview, Padukone praises Pandit Birju Maharaj by emphasizing "the level that Birju Maharaj teaches,"⁶⁴ thus elevating his status within his area of expertise the Lucknow gharana. Additionally, according to Margaret Walker,

It still seems crucially important even in the twenty-first century, that dance gharānā family members maintain their gharānā's identity as distinct, not only from other gharānās, but also from the inevitable spread of the style through the disciples of disciples. For example, rather than market themselves as authorities of the Lucknow gharānā as countless close disciples can and do, members of the Lucknow central family are now using the names of their forbears. On his personal website, Birju Maharaj is identified as the 'torch-bearer' of the Kalka-Bindadin Gharana of Lucknow, and his son, Jai Kishan Maharaj, calls the school he runs with his wife Ruby Misra, the Birju Maharaj Parampara. This is surely in part publicity and marketing, but it is also a method of controlling the style and maintaining ownership.⁶⁵

The need to appraise and find a connection to this "parampara" or family inherently promotes Birju Maharaj and in turn, the narrative of the gharana. By creating a closely woven web within the Lucknow gharana, there is little room for any female figures to have a presence. As a result, this reduces Padukone's effect as a performer as a female and gives credit to the male teacher which aligns with the progression of the male narrative.

The choice to cast Deepika Padukone was tactful, as Padukone has since then crossed into the Hollywood sphere. Padukone debuted her career in Hollywood with the movie *xXx: Return of Xander Cage* in 2017.⁶⁶ By casting a prominent figure entering the movie industry in the United States, Bajirao Mastani instantly becomes more appealing to the public all over the world, emphasizing efforts to make the movie increasingly globalized. Additionally, well-known actress, model, and singer Priyanka Chopra was also in this movie. Her recent involvement in multiple facets of American media, including modeling and Hollywood also yielded more interest globally. Within the first week of its release in theaters overseas, Bajirao Mastani made close to \$6.5 million.⁶⁷ Its success was highly attributed to its use of women who are present and prominently sexualized in media, specifically in the context of this movie. Via tactical decisions with regard to casting and movie distribution, kathak was used as a mode that

enabled globalization of film to take place. Bollywood was able to rebrand kathak as an exotic dance form using the face of a prominent and sexualized actor. The item song *Mohe Rang Do Laal* displays popularized and sexualized undertones through its choreography and costume design, and accredits a male Kathak with choreographic license. As a result, these elements retract from the female narrative and propagate the male-driven gharana. The image of a tawa'if was used to set the tone from the beginning of the song as Padukone was seated. The director focused on the subtleties passed between Mastani and Bajirao in order to hypersexualize the song. Nonetheless, these actions were decided by Pandit Birju Maharaj, an exponent of the Lucknow gharana. Mainstream Bollywood media decentralized tawa'if culture and Padukone's agency as a female dancer and used it as a way to enhance the construction of the gharana and male narrative to monopolize the culture in various parts of the world. However, Bollywood is not the only place from which globalization efforts stem.

Media in the United States

Thus far, we have seen kathak's trajectory throughout the Indian context. Kathak has been influenced by the male-driven gharana and in turn suppressed the female narrative due to the Bollywood movie industry. In the 20th century, we see how kathak is used as a platform for a love stories and subtly erotic interactions. Moving into the 21st century, Bollywood tactfully uses transnationally recognized female actors and scenes depicting excess to exaggerate the traditional kathak narrative. The manipulation of kathak, however, extends beyond Bollywood into American television shows. Emmy Award-winning reality show *So You Think You Can Dance* has popularized kathak through the use of the Bollywood dance genre in order to please audiences all over America in order to gain votes and keep the television series interactive and entertaining for viewers. Based on his extensive training background, it is evident that Mahajan is well-versed in the kathak technique and knows the religious origins to the dance. However, the Bollywood dance routines he choreographs for the show do not encapsulate nor emphasize core kathak steps and movements. Instead of Mahajan's lack of classical direction for his dance students shows how he assumes his own, abbreviated narrative to teach the choreography within a week, just in time for the next showing of *So You Think You Can Dance*. Kathak (along with other forms of classical Indian dance) takes years of training, focus, and self-discovery in order to master the art form. By teaching Bollywood dance as a way "into" the Indian culture, Mahajan undercuts the technical rigor that classical Indian dance training requires from a dancer and undermines its foundational value for the Bollywood steps that are performed on the American stage. Mahajan also uses his background in kathak and bharatanatyam in order to teach mudras that are used in Bollywood Dancing via MoveTube Network.⁶⁸ This channel is easily accessible, allowing for globalization to occur because it draws more attention to the dance form as a skillset without any historical context. Mahajan calls hamsasyam, a mudra used to demonstrate plucking flowers or wearing a necklace "deer" in order to draw common parallels for viewers.⁶⁹ This simplification of the classical dance terminology allows Mahajan to reach broader audiences, while simultaneously distorting the dominant usage of the mudra within various classical dance forms. While increasing cultural awareness is a positive feature to his video, his lessons lead viewers to trust mislabeled information and gain a skewed

impression of classical Indian dance. As a result, the targeted effect of globalization fails because it does not adequately represent an aspect of the Indian culture, namely kathak and other classical dance forms by devaluing its rigorous nature. In turn, kathak becomes a mere technical feature of dance instead of an element of Indian history, culture and technique.

The Importance of Kathak

In an effort to globalize various facets of the Indian identity, kathak has been manipulated and reframed within the Indian context for centuries as it changed from a female narrative to a male-centric dance style. This pendulous trend is detrimental to the art form for two main reasons: rejection of tawa'if culture and the sexualization of the female body under the misnomer of kathak through media. During the colonial period, courtesan culture was under strict scrutiny. What began as a female-led dance style abruptly transformed into a generalized form of dance for entertainment purposes. This reduced the technical expertise the tawa'ifs had, referring to them as nautch girls. The anti-nautch movement led to male and female-driven sexism and separation from tawa'if culture, and forced tawa'ifs and devadasis out of the mainstream dance sphere through the formation of the gharana and the kathak institutions such as that of Leila Sokhey. With India's independence from the British Raj, media flourished, but at the expense of the female body. Movies from the mid 20th century through present day Bollywood showcase the importance of the gharana and traditional male kathak gurus like Pandit Birju Maharaj, while devaluing the female narrative to possess corporeal significance alone. As a result, the female narrative is compromised and misrepresented transnationally.

However, globalization was not exclusively damaging to kathak's female narrative, as modern dancer and choreographer Ruth St. Denis proved her approach to benefit the female narrative. In order to stage Radha, St. Denis traveled first to Coney Island and then to Calcutta in order to learn more about kathak. Instead of allowing the male narrative to consume her impression of kathak dance, she utilized the tawa'if culture to enhance the female narrative. In doing so, the validity of courtesan culture increased and allowed the female narrative to succeed in a patriarchal system. Since St. Denis took advantage of an exoticized Indian image, her cultural appropriation does not go unnoticed. Her piece Radha used a skewed perception and minimal firsthand experience with classical Indian dance in the South Asian context. However, her efforts to exercise artistic freedom with respect to classical Indian dance in the United States allowed her to leave her mark and add to the female narrative that was beginning to emerge in the early and mid 20th century. Therefore, her strides in the American context were great, but at the cost of a globalized Indian image.

Here lies the importance of kathak: this classical Indian dance style has a complex history that still shows its influences today at the expense of the female body. So although globalization does not have a strictly negative effect on kathak, the momentum created by Ruth St. Denis could be re-scripted to rethink the scope of kathak today. This can be accomplished in two ways. Primarily, in this age of media, technology can be used to disseminate information. However, Mahajan has proven that up to this point technology has been improperly used for kathak training purposes. If this mode of communication were used to teach kathak to students at the same rate as traditional students of dance and

the same material including technical terminology, then the technical rigor would be more appreciated. An e-guru so to speak could publish his or her lessons in steady increments, similar to the progression of traditional kathak lessons. Students can learn and practice, and present their progress to their guru virtually and receive feedback according to their performance. This set-up resembles the structure of a classical Indian dance class, but incorporates the technological element in a relatively seamless manner while maintaining its comprehensive nature. Additionally, the misrepresentation of kathak would not be as easily accepted and integrated into mainstream Bollywood media if there were greater awareness around technical merit that is required in kathak performance. By increasing awareness, the female narrative can steer away from its strictly erotic nature associated with prostitution from the British Raj, and instead showcase the technical strengths found in the courtesan narrative that is embodied in kathak. Jans among other courtesans were skilled and educated women that held a high status in pre-colonial India, especially as compared to other women who bore no title without their male counterparts.⁷⁰ If that image is restored in the present-day kathak dance context, kathak can regain the legitimacy of its female narrative.

Another way to legitimize the female narrative is through the acceptance of tawa'if culture and incorporation of their technique into kathak institutions. Although Leila Sokhey rejected the female hereditary dancers due to the anti-nautch movement, a school that accepted this lineage could correct or even end the social stigma to tawa'if lineage and disseminate kathak knowledge. This would allow the female narrative to once again bear weight against the scripting of a male-dominated kathak. A movement to relocate these lineages would help increase the pride in this female-oriented history and reduce the stigma attached to courtesan culture. While the Lucknow, Benaras, and Jaipur gharanas are not dispensable, this effort could heighten the female narrative rather than subdue the currently dominating male narrative. Thus, the male gharana would not direct all kathak institutions, but rather act as a component of dance training in kathak's multifaceted technical elements in addition to the technical merit achieved by tawa'ifs during the pre-colonial era. Kathak's complex history is obvious and those complexities have not faded, but rather heightened with the incorporation of transnational media. The pendulum of kathak swings back and forth between symbols of lust and technical mastery, male and female, Southeast Asia, Europe, and the U.S. By legitimizing the female narrative without its current exoticized lens, kathak can be framed with a more balanced set of narratives and continue for generations.

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Sachi Pathak is a Junior at the University of North Carolina at Chapel Hill. She is majoring in Hispanic Literature and Cultures and minoring in Medical Anthropology and Chemistry. She is trained in kathak along with ballet and modern dance. Sachi began her research on kathak and courtesan culture in February, 2017 for a class taught by Dr. Harshita Kamath in the Religious Studies department as a culminating research paper. Sachi continued to work on her research through the next semester under Dr. Kamath's direction. While Sachi is working to become a physician, she is interested in combining her extracurricular passions in dance with academia.

Natural Sciences

65-69

Color Condrum: Trace
Element Analysis in the
Poleta and Deep Spring
Formations

by Eileen Yang, Matt
Sorge, Samuel Williams,
and Amruthansh
Sriperumbudur

Eileen Yang, Matt Sorge, Samuel
Williams, and Amruthansh
Sriperumbudur, through a Geology
first-year seminar, began research on
the colorization of limestone in the
Middle and Upper Poleta Formation
and Deep Spring Formation in
Eastern California, discovering the
colorization indicated dolomitization
of the limestone

Color Conundrum: Trace Element Analysis in the Poleta and Deep Spring Formations

by Eileen Yang, Matt Sorge, Samuel Williams, Amruthansh

Trace element concentration data from the Middle and Upper Poleta Formation and Deep Spring Formation in Eastern California suggest that color differences between blue and tan limestones are primarily correlated with alteration, specifically dolomitization, of the blue limestone. Blue limestones from both the Poleta and Deep Spring Formations were found to possess lower Ca/Mg ratios, indicating greater dolomitization compared to tan limestones from the Upper Poleta Formation. Strontium concentrations, which are another common indicator of alteration in limestone, were also found to be much lower in blue limestone samples than in tan limestone samples, further supporting the claim of greater alteration in blue limestone. Coloration may also be related to concentrations of transition metals Fe and Mn. Higher concentrations of Fe and Mn are associated with an orange-brown and pink color respectively, which is consistent with our data; tan Poleta samples generally contained higher concentrations of both metals compared to both the blue Poleta and blue Deep Spring samples, with a decrease in Fe and Mn concentrations corresponding with stratigraphic transitions from tan to blue Poleta limestone.

Keywords: Limestone, Trace elements, Alteration, Stratigraphy, Formation

BACKGROUND

Limestone Basics

Limestone is a sedimentary rock with the general chemical composition of calcium carbonate (CaCO_3). Biogenic limestone is the most common limestone, and is formed over long periods of time through the compression of the shells and debris of ancient marine organisms. While some limestone is inorganically formed through the precipitation of CaCO_3 in bodies of water, the Poleta and Deep Spring limestone examined in this paper is biogenic in origin. While limestone is primarily composed of CaCO_3 , it can be chemically altered due to its porous nature; when water seeps through limestone, the limestone's composition can change as it comes in contact with the minerals and trace elements carried by the water. In this paper, a specific kind of alteration, known as dolomitization, will be examined in detail. Dolomitization occurs when a portion of the Ca present in limestone is replaced with Mg, changing the limestone's chemical composition from CaCO_3 to $\text{CaMg}(\text{CO}_3)_2$.

What is a Formation?

Throughout this paper, readers will notice the emphasis placed

on the term “formation”, specifically in regards to the Poleta and Deep Spring Formations from which limestone samples were collected. A formation, in geologic terms, is an area or collection of similar rock that can be distinguished from nearby rock, and occupies a large enough area to be mapped. This term is especially relevant to this paper, as the color changes in the formations in question (in the Poleta, from a tan layer to a blue layer, then back to a tan layer) are regionally significant, meaning that they extend over the entire formation rather than extending over just a small section of it.

INTRODUCTION

The Poleta Formation, formed in the early Cambrian Period (approximately 540 million years ago), is composed in part of limestone (Nelson, 1962). Defining features of the Poleta Formation's uppermost limestone layers are color changes from a tan layer at the bottom to a blue-gray layer in the middle, and back to a tan layer at the top (Fig. 1). The causes of the color variations in the limestone are unknown. Because chemical composition often plays an important role in determining the color of minerals, we hypothesized that variations in the concentrations of trace

elements, specifically the transition metals, between the tan and blue varieties of the Poleta limestone are responsible for the differences in color (White, 2013). Correlations in the presence and concentrations of trace elements could be used to help better understand depositional environments and other events impacting the formation of the Poleta and limestones in general.

Figure 1. Tan and blue layers of the Poleta Formation in the Little Poleta Folds, Deep Springs Valley, CA. Photo courtesy of Abhigya Chennamsetty.



METHODS

Sample Collection

Samples were collected from the Little Poleta Folds (one blue sample from a limestone in the Middle Poleta, eight samples from the tan/blue/tan sequence in the Upper Poleta), and five samples from the Deep Spring Formation (2 tremolite marble, three Deep Spring blue). Deep Spring samples were collected to compare with the Poleta samples to identify more general correlations between color of the limestone and chemistry. Samples were photographed and assigned a matching value from the Munsell Soil Color Chart.

Sample Preparation

All rock samples were ground into fine powder using mortar and pestle. Around 2.5 mg of each rock sample were then dissolved in 10 mL of 2% HNO₃.

Data Collection

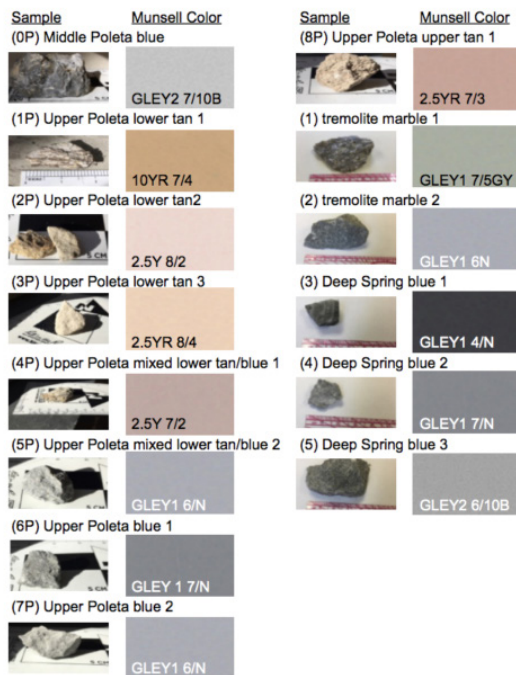
Samples were run through the Inductively Coupled Plasma Mass Spectrometer (ICP-MS) to analyze for presence/concentration of trace elements. Rock solution peak heights were compared to peak heights for calibrated National Institute of Standards and Technology (NIST) sample solutions to determine absolute concentrations. Elements analyzed included Li, Na, Mg, Al, K, Ca, Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, Rb, Sr, Mo, Th, and U.

Graphing and Analysis

The elements Mg, Al, Ca, Cr, Mn, Fe, V, Zn, Rb, and Sr were the focus for data analysis. Other elements were present in concentrations below detection limits. Scatter plots were made to compare color with trace element concentrations.

Figure 2. Samples collected from the Poleta and Deep Spring Formations, with matching colors and values from the Munsell Soil Color Chart displayed.

RESULTS



Munsell color values show that each limestone color (blue vs. tan) shares the same Munsell color category, with the blue Poleta and blue Deep Spring samples falling within the GLEY category and the tan Poleta samples falling within the YR category (Fig. 2). Additionally, samples taken near the borders between differently colored layers have mixed colorations. The stratigraphic transition in the color chart correlates with the vertical transition of trace elements.

The tan Poleta and blue Deep Spring samples have higher Ca/Mg ratios than the blue Poleta and Deep Spring tremolite marble samples (Figs. 3, 4). Concentrations of Sr are highest in the lower tan Poleta, decrease in the blue Poleta, and then begin to increase again in the upper tan Poleta (Fig. 5). Low Sr concentrations correlate with low Ca/Mg ratios (Fig. 3).

The base of the Upper Poleta limestone (lower tan 1) is characterized by high concentrations of most elements compared to other Poleta samples (Figs. 5, 7, 9; Table 1). Within the Poleta Formation, Fe and Mn concentrations drop from high to low in the lower tan samples when compared to the blue samples, then begin to increase again in the upper tan (Figs. 7, 9). The Middle Poleta blue limestone sample and the blue Deep Spring samples generally have low Fe and Mn concentrations similar to those found in blue Upper Poleta samples (Figs. 6, 8). Mixed Poleta samples share similarities in trace element concentrations of both the blue and tan Poleta (Figs. 6, 8).

Sample Name	Mg (ppm)	Al (ppm)	Ca (ppm)	V (ppm)	Cr (ppm)	Mn (ppm)	Fe (ppm)	Zn (ppm)	Rb (ppm)	Sr (ppm)
(1) Tremolite Marble 1	97283.911	150.361	182799.457	1.043	11.866	1580.538	13703.700	21.336	0.580	42.713
(2) Tremolite Marble 2	120603.657	131.793	217137.877	4.743	2.375	908.870	5631.376	8.608	0.531	53.115
(3) Deep Springs Blue 1	1732.300	28.771	331096.747	0.519	3.099	44.288	78.543	22.092	0.104	572.423
(4) Deep Springs Blue 2	9703.750	99.282	392986.869	0.873	1.975	98.311	173.260	7.341	0.192	1167.708
(5) Deep Springs Blue 3	2292.422	105.655	391345.115	0.185	1.445	78.766	143.107	6.576	0.076	956.909
(0P) Middle Poleta Blue 1	10109.903	3086.694	226829.423	3.790	5.594	192.017	2344.565	22.085	11.338	412.864
(1P) Poleta Lower Tan 1	4205.176	3565.995	416073.890	5.643	11.089	420.911	5188.342	10.490	16.920	2848.469
(2P) Poleta Lower Tan 2	2603.242	478.409	374533.357	0.931	2.566	155.778	1758.131	86.242	4.952	1620.661
(3P) Poleta Lower Tan 3	1688.247	114.663	333618.423	0.177	1.564	103.593	1217.282	11.318	0.274	1294.100
(4P) Poleta Mixed Lower Tan/Blue 1	5264.820	706.396	337816.172	1.779	2.569	140.839	652.993	3.063	4.030	681.870
(5P) Poleta Mixed Lower Tan/Blue 2	27628.244	2391.225	450682.832	4.194	4.508	202.204	1885.056	7.629	14.258	957.291
(6P) Poleta Blue 1	11434.962	585.000	332108.630	1.160	2.597	92.756	655.674	11.492	2.570	501.716
(7P) Poleta Blue 2	26150.040	115.942	380256.627	0.800	2.005	146.350	544.366	5.451	0.439	454.549
(8P) Poleta Upper Tan 1	4348.307	663.017	363961.614	1.442	2.754	786.450	1474.482	7.508	1.881	545.107

Table 1. Absolute concentrations of trace elements in Poleta and Deep Spring samples taken.

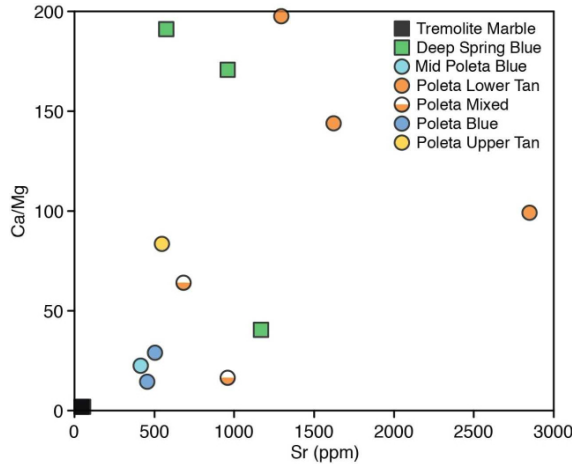


Figure 3. Low Ca/Mg ratios indicate dolomitization (with a ratio of ~1.65 characterizing pure dolomite). Lower Sr concentrations similarly indicate alteration of the limestone.

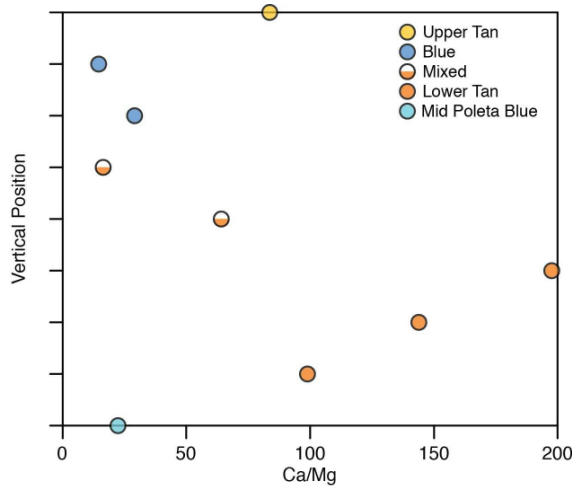


Figure 4. Ca/Mg ratios show trends moving through the layers of the Poleta, with lower Ca/Mg ratios corresponding with blue limestone samples and higher Ca/Mg ratios with tan limestone samples.

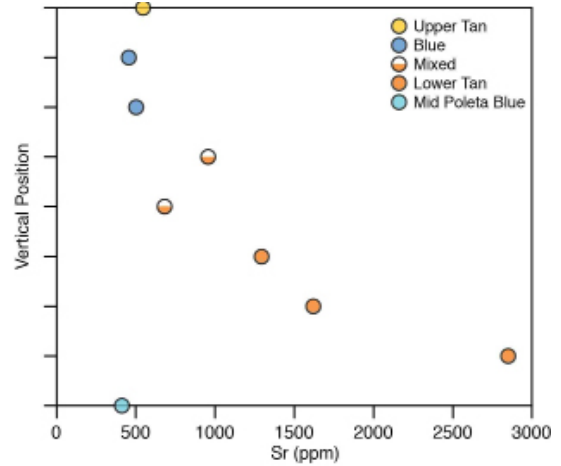


Figure 5. Sr concentrations also show trends moving through the layers of the Poleta, with lower Sr concentrations generally corresponding with blue samples and higher Sr concentrations with tan samples. The upper tan sample's low Sr concentration could be related to the dolomitization of the blue limestone underneath it.

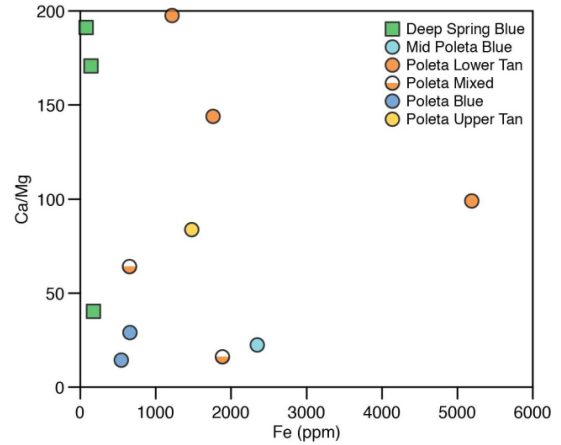


Figure 6. Comparison of Ca/Mg ratios and Fe concentrations of all limestone samples.

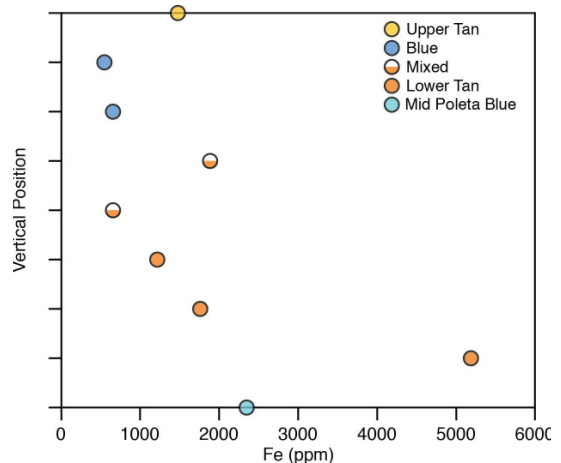


Figure 7. Comparison of Fe concentration with vertical positions of Poleta samples. Blue samples generally contain less Fe, and Fe concentrations from lower tan samples decrease going into the blue layer.

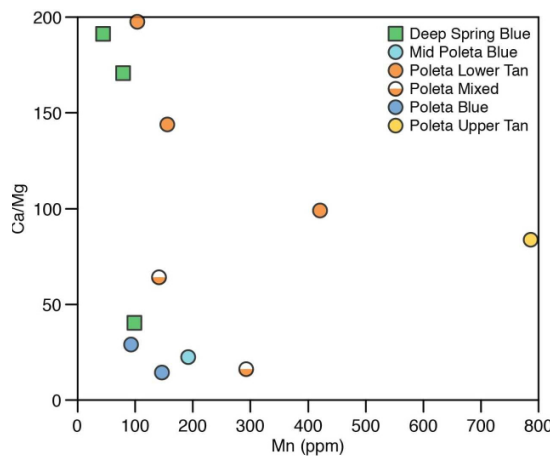


Figure 8. Comparison of Ca/Mg ratios and Mn concentrations of all limestone samples.

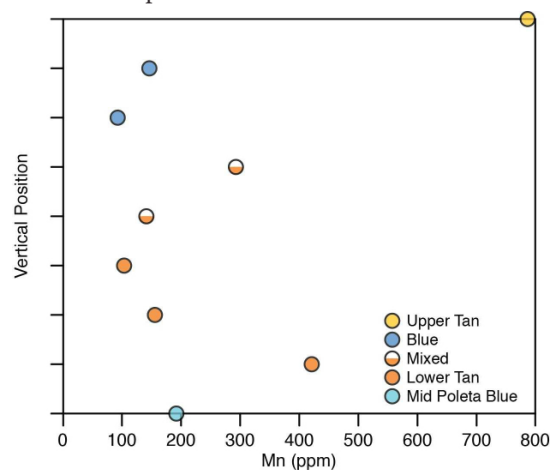


Figure 9. Mn concentrations also follow a general trend vertically through the Poleta. Blue samples generally contain less Mn, and Mn concentrations decrease going from the lower tan layer into the blue layer.

DISCUSSION

Alteration of limestone correlates with differences in limestone coloration. The Poleta blue limestone, as well as the tremolite (calcium magnesium-rich silicate) marble from the Deep Spring formation are more dolomitized than the Poleta tan samples, as shown by lower Ca/Mg ratios (Nesse, 2012). Concentrations of Sr in the blue limestones are ~500 ppm, much lower than the >2000 ppm Sr concentrations recorded in unaltered modern limestone (Gischler et al, 2013). This lower concentration of Sr further supports the conclusion that blue Poleta limestone is more altered compared to tan Poleta limestone.

Transition metals Fe and Mn correlate and likely contribute to the tan coloration of the Poleta. In general, tan Poleta samples have higher concentrations of both Fe and Mn than blue Poleta and blue Deep Spring samples. High concentrations of Fe can cause orange-brown coloration of minerals; high concentrations of Mn are similarly associated with pink coloration of minerals (Nesse, 2012). Poleta tan limestones contain higher transition metal concentrations than Poleta blue limestones in general (specifically Fe and Mn), which could have originated from percolation from surrounding sedimentary rocks, like shale/sandstone beneath Poleta lower tan 1.

Implications and Extrapolations

Because the differences in the limestones examined extend throughout the entirety of the Poleta and Deep Spring formations, it is clear that the formations were exposed to a factor that caused regional alteration rather than a deposition, which would have only affected small, localized areas of the formations. The Ca/Mg ratios and Sr concentration data support these claims; lower Ca/Mg ratios in the blue Poleta limestone and Deep Spring tremolite marble indicate that these sections of the Poleta and Deep Spring formations have been chemically altered, more specifically, dolomitized to become $\text{CaMg}(\text{CO}_3)_2$.

This large-scale alteration is most likely due to water; because of limestone’s porous nature, water is able to percolate through the rock, causing alteration as the minerals in the water come in contact with the limestone. Extrapolating from this conclusion, a plausible explanation for alteration in the blue layer of the Poleta Formation could be that it is composed of more porous limestone compared to the tan layers that surround it, which would allow water to seep through it more readily, resulting in more alteration.

CONCLUSIONS

Dolomitization of limestone, as measured through Ca/Mg ratios and correlated with Sr concentrations, seems to be predominantly responsible for color differences present in the Poleta, as the strongest data trends were found relating alteration in limestone and blue coloration. Additionally, though transition metals Fe and Mn probably contribute to the coloration of the tan Poleta limestone, the general trends in our data suggest that transition metal/trace element concentrations are not the primary contributing factors to color differences in limestones. Further studies should be conducted to explore other factors that could affect limestone coloration, such as organic material concentration, silicates, and other elements.

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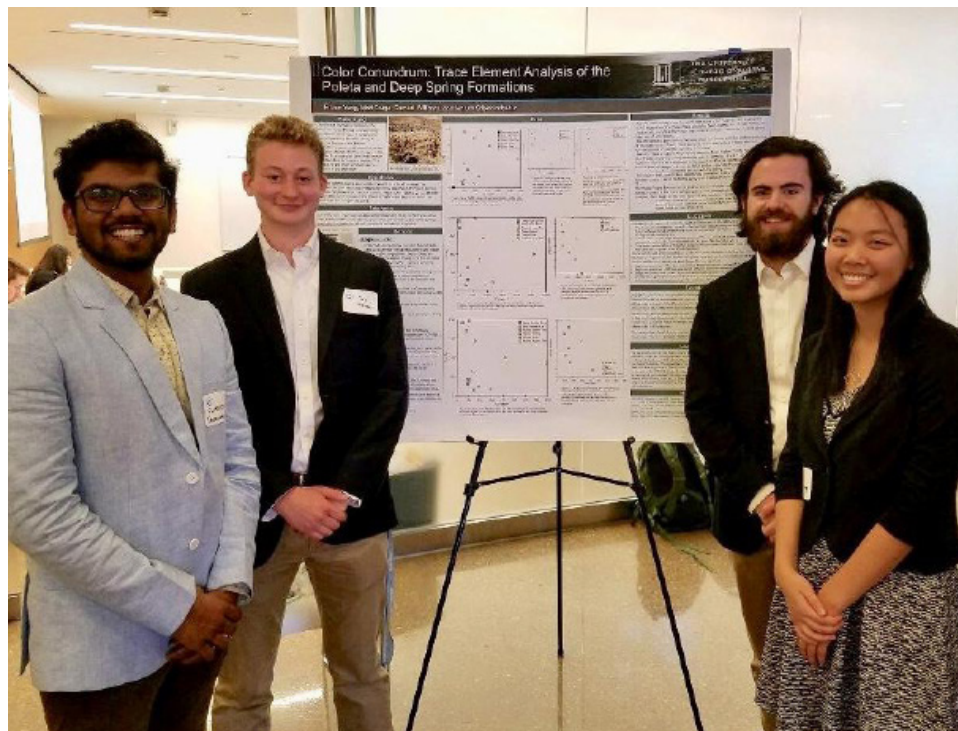
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Eileen Yang, Matt Sorge, Samuel Williams, and Amruthansh Sriperumbudur are first-year students at the University of North Carolina at Chapel Hill. They collaborated on this original research project as a part of their GEOL 72H (Field Geology of Eastern California) class in Fall 2017. Their research explores the relationships between trace element concentration and widespread alteration of limestone, and the observable differences in limestone coloration in the Upper Poleta formation in Eastern California. Eileen is currently undecided in her major, but hopes to pursue a career in Dentistry; Matt is a double major in Philosophy and Geography; Samuel is a Geology major; and Amruthansh is a double major in Computer Science and Behavioral Finance.



Abstracts

Winning Abstracts from Celebration of Undergraduate Research 2018

Neural Mechanisms Underlying Attributional Ambiguity: An Investigation of Cross-Race Social Feedback by **Carrington Merritt**

Emerging research suggests that ambiguous cross-racial interactions, such as a Black individual receiving positive feedback from a White individual, may actually create stress-provoking situations for Black individuals. ¹ These findings may reflect the consequences of “attributional ambiguity,” or minority individuals’ uncertainty about whether to attribute positive feedback from Whites as being genuine or simply motivated by a desire to not appear prejudiced. ² To date, the neural mechanisms underlying these counter-intuitive responses are largely unknown. As such, the current study examined Black individuals’ neural responses to positive social feedback from racial outgroup members (e.g. White individuals). Twenty-two African American adults (18-37) participated in a fMRI social feedback task and completed various self-report measures. It is hypothesized that racial outgroup positive feedback will produce greater activity in threat-related neural regions (e.g. amygdala and dACC), reduced activity in reward processing regions (e.g. VS and vmPFC), and greater activity in social cognitive processing regions (e.g. medial PFC). It is also expected that self-reports of suspicion of Whites’ motives and perceived discrimination will be associated with the hypothesized patterns of neural activity. Data analysis is pending. Anticipated results will be the first to link neural mechanisms to cross-race positive feedback and aid in understanding why such feedback elicits negative outcomes.

Track: Diversity & Equity

Advisor: Keely Muscatell (Psychology and Neuroscience)

Graduate Student Contributors: Arun Nandana

Modernity Versus Tradition in Fatima Mernissi’s *Dreams of Trespass* by **Dhalia Mohamed**

1940s and 50s Morocco was faced with the difficulties transitioning from colonialism to modernism, which had significant social impacts that were felt even on an individual level. Culturally, the shift to adulthood in this transitioning Morocco was changing. Fatima Mernissi, author of *Dreams of Trespass: Tales of a Harem Girlhood*, writes her fictive memoir detailing her life in harems during this rather underrepresented time with economic and political consequences. This project examines the multiple layers of impacts these transitions had on women in harems during this historical time. When combined with analysis of the nature of harems, societal structures of gender, cultural concepts of balancing truth and convenience in everyday lives, and the imposition of colonialism, Mernissi’s artistic rendering of a new and profound perspective on personal desires of freedom and community become reflected in the clashes of modernity with tradition in Middle Eastern culture when contrasted with the necessity to stay rooted in a rich, historical tradition. While we inspect in parallel the powers imposed on these women through colonial and patriarchal structures, we aim to press deepest upon the gender structures that carry the most significant impact within this novel.

Track: Diversity & Equity

Advisor: Claudia Yaghoobi (Asian Studies)

Undergraduate Co-Authors: Stephanie Cales, Michael Myers, Gregory Sanders, Jessica Glass

The Legacy of a Lynching: Community and Familial Adaptation in the Wake of Racial Trauma by **Morgan Vickers**

The history of lynching in America has been shaped by statistics, trends, and characterizations of the mobs involved in the murder of an accused individual. But, few have studied the lives and the communities of the victims of the lynchings, and even fewer have sought to recreate the circumstances in which the lynchings took place by means of digital resources and tools. As a result, the memory of a lynching is often defined by purported criminality, angry mobs, and an eventual death of the accused, rather than by the community conditions that precipitated the lynching, the life lost during the murder, and the community condition thereafter. In this thesis, I introduce the notion of personhood in lynching victims through the case study of a single victim: Eugene Daniel from New Hope Township, North Carolina, who was murdered just six days after his sixteenth birthday in 1921. Using digital tools to reproduce a model of community relations in small towns, one can uncover what happened to relationships between local families over time, particularly the families involved in and affected by the lynchings. This thesis thus argues that one cannot separate people from the context in which they live; acts of racial violence, like lynchings, neither exist in a vacuum nor solely affect the murdered individual. I further argue that modern digital tools allow historians to gain a better understanding of the circumstances that perpetuated lynchings, the communities in which lynchings occurred, and the contemporary implications of historic acts of violence.

Track: Diversity & Equity

Advisor: Seth Kotch (American Studies)

Prevalence and Risks of Contaminants in Private Well Water by **Simran Khadka**

Private well water quality is not regulated by the Environmental Protection Agency (EPA), and there are approximately 58,000 people in Gaston County and 136,000 people in Wake County who depend on these wells. The study conducted an environmental risk assessment to characterize the health risks of contaminants detected from private wells in Wake and Gaston County using the databases from the North Carolina Department of Public Health. The methods included determining contaminants above the maximum contaminant level (MCL), finding the reference doses or cancer slope factors for each contaminant, and performing Monte Carlo simulations to quantify the cancer risks and hazard quotients. The contaminants above the primary MCLs in Wake County were arsenic, cadmium, chromium, lead, mercury, selenium, and tetrachloroethylene (PCE). The contaminants above MCLs in Gaston County were arsenic and lead. None of the hazard quotients were above 1. The median cancer risk from the arsenic and PCE in both counties was 2.14×10^{-5} , 95% CI [3.35×10^{-3} , 1.65×10^{-7}]. The study is applicable towards public health interventions and water regulations to improve water quality and health.

Track: Environment

Advisor: Jacqueline MacDonald Gibson (Environmental Sciences and Engineering)

Bound by the Care We've Learned to Receive: The Persistence of Adolescent Health and Dental Care Utilization Behaviors into Young Adulthood by **Jenny Hausler**

The transition from adolescence to young adulthood, though often considered a period of newfound independence and freedom, is characterized by worsening health and decreased health and dental care utilization, especially among males. To further understand the factors that shape health and dental care utilization during young adulthood, this study examines the socioeconomic stratification of adolescent health and dental care utilization behaviors, the impact of these behaviors during adolescence on health and dental care utilization during young adulthood, and the modifying effects of gender on utilization across the transition to young adulthood. Controlling for disparate levels of access and need, I use multivariate logistic regressions to analyze data from Waves I and IV of the National Longitudinal Study of Adolescent to Adult Health. I find that lower parental educational attainment and income are significantly associated with lower odds of care during adolescence. My results also reveal the persistence of adolescent utilization behaviors into young adulthood, but gender is not related to the endurance of such behaviors. Among other theories, I integrate the life course perspective into the Behavioral Model of Health Services Use to explain my findings and make a call for improvements in social and health care policies to prevent the further stratification of health and dental care, as well as the persistence of poor utilization behaviors into young adulthood.

Track: Health & Well-being

Advisor: Robert Hummer (Sociology)

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Development of Custom MRI Cradle and Habituation Protocol for Functional Neuroimaging in Awake Mice by **Carolyn Liu**

Functional connectivity magnetic resonance imaging (fcMRI) is a whole brain neuroimaging technique that measures coherence among neurons in different brain regions. High-field MRI scanners have permitted fcMRI mapping in experimental mice models, allowing for circuit-level dissection of many neuropathological models. However, the majority of fcMRI studies published in mice are performed under anesthesia, resulting in neuronal activity suppression that make findings difficult to compare to human fcMRI data acquired in awake participants. Though attempts have been made to image conscious mice, navigating adequate head-restraining to reduce image movement and suppressing stress-induced neurocircuit alterations in these mice has been a great challenge addressed by habituating mice to the restraining and scanning conditions experienced during awake imaging. In this study we designed and tested the habituation conditions in custom awake mouse imaging cradle that prevents motion artifacts through minimally invasive surgery to implant an MR-compatible head plate and acquire blood-oxygen-level dependent (BOLD) fcMRI data using single-shot gradient echo EPI. To compare circuit level changes of stress in mice, we quantified corticosterone levels in serum by ELISA. This project has culminated in the establishment of the first awake rodent fcMRI protocol on campus and believe its utilization will improve our ability to relate fcMRI data between rodents and humans.

Track: Health & Well-Being

Advisor: Yen Yu Shih (Department of Neurology)

Graduate Student Contributors: Esteban Oyarzabal

Portable Apheresis Machine for Cheap & Rapid Generation of Convalescent Serum in West Africa by **Dhruv Shankar**

The 2013-2016 Ebola virus outbreak in West Africa affected over 28,000 patients and claimed at least 11,000 lives. In the absence of an effective cure or vaccine, public health officials resorted to alternative strategies to treat patients infected with Ebola, such as convalescent plasma therapy (CPT). CPT involves the collection of plasma from convalescent Ebola patients with an apheresis machine. However, most apheresis devices on the market are too expensive and bulky for use in rural, impoverished areas and thus CPT was not widely utilized during the outbreak. We proposed to develop a low-cost, portable apheresis device for collecting convalescent plasma in areas with limited health infrastructure. We designed a filtration system for separating plasma from whole blood using a hollow-fiber filter instead of a centrifuge, which reduced the cost and size of the device. Three different filter designs were tested for integrity and performance at operating conditions similar to those of existing apheresis devices. Hemoglobin and ELISA assays were designed in order to test the collected plasma for hemolysis and determine its antibody content. The initial results demonstrated that all three filter designs were susceptible to rupture under normal operating conditions. Our future work will focus on implementing a new fabrication method to create more resilient apheresis filters.

Track: Health & Well-Being

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Defining Subjecthood in Eighteenth-Century British North America: The Life and Perspectives of Sir Guy Carleton by **Lacey Hunter**

This thesis examines subjecthood in British North America during the late eighteenth century through the lens of how a British official, Sir Guy Carleton, incorporated new subjects into the British Empire. The "new subjects" discussed in my paper are French-Canadians, Indians, and exslaves. Through examining the course of Carleton's life, this paper argues that his efforts to smoothly bring new subjects into the empire stemmed from his background within the British imperial system particularly the military and public office. He believed imperial control and the king's protection was in everyone's best interest, and obedient and content subjects were essential to the continuity of the growing empire. The era's tendency of ethnocentricity clashed with the reality of an increasingly heterogeneous empire. Carleton's professionalizing approach to his responsibilities in both the military and public office, however, affirmed Britain's increasingly legally inclusive notions of subjecthood. His beliefs were particularly evident when he decisively acted to ensure the safety and evacuation of 3,000 black loyalists, many of whom had been enslaved, out of the newly independent American colonies in 1783. Utilizing primary documents written both to and from Carleton, as well as other contemporary correspondence and works, this paper concludes that Carleton believed applying the law to all of His Majesty's loyal subjects, of whatever race or ethnicity, would ensure a prosperous empire.

Track: The US & Foreign Relations

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