DELIBERATIONS

A Journal of First-Year Writing at Duke University • Fall 2016

"We are very pleased to present these fine examples of student work from Duke's Academic Writing classes. You will see that our Academic Writing courses permit a wide range of work by students in a variety of disciplines. This work is both creative and scholarly, and thus introduces first-year students to the kind of rigorous and innovative thinking that distinguishes an academic community such as Duke."

J. Clare Woods, Ph.D., Director
Thompson Writing Program

Table of Contents

Foreword

Sheryl Emch

True to the name of the journal, *Deliberations*, this collection of outstanding essays, written by first-year students in Writing 101-- Duke's one-semester, first-year course in academic writing-- are indeed deliberations. That is, each essay was written, and rewritten, with careful and reflective consideration. The process of generating ideas, exploring and reflecting on their significance, writing and revising and editing, was without a doubt an extremely deliberate process, done consciously, thoughtfully, slowly, (sometimes joyfully and sometimes painfully), with the utmost concern for the process and the product. In other words, these essays are deliberations of the highest quality, and have the potential to touch many lives.

I have been teaching first-year writing at Duke for nearly a decade (and loving every minute of it!), so I am no stranger to the fascinating and vast array of topics being offered to introduce first-year students to university level writing. All Writing 101 classes share the goals of helping students to engage with the work of others, articulate a position, situate their writing within specific contexts, and transfer their writing knowledge beyond Writing 101. That said, each instructor, inspired by their academic discipline and personal interests, puts these goals into practice in different ways, creating very distinct classes with an array of unique final papers and projects.

These papers and projects foster the development of strategies for generating, supporting, and sharing their ideas within a community of scholars. While all Writing 101 students are encouraged to write as though they are writing for a broad audience, for most students their immediate community is comprised of 11 other first-year students and the professor. For students whose work is published in Deliberations (or elsewhere), however, their community expands infinitely. Their work is no longer being read just by their classmates, their professor, or anyone else with whom they decide to share their work. These students have chosen, and been chosen, to share their work with the entire Duke community and beyond. They have put their ideas out for public consumption, as well as public scrutiny, deliberately and bravely expanding their audience and community of scholars. This is no simple task, but rather an act of strength and courage, an ability and willingness to engage openly and honestly about their own and others' ideas.

Our editorial board, consisting of an extraordinary group of Writing 101 Instructors, Duke librarians, and previously published *Deliberations*' student authors, selected eight remarkable essays that reflect the diversity of academic disciplines of the TWP faculty, and in turn, the impressive range of beliefs about and approaches to academic writing. Each of the published essays touched, inspired, moved, provoked, and/or resonated with several readers in some way.

This issue begins with Annie Janick's essay, *Taking Down the Confederate Flag: A Learning Process*, which explores how learning theory relates to the mass movement against the Confederate flag in her home state of South Carolina following the Charleston shooting in June 2015. Citing the influence of terror and conflicting social identities on South Carolinians' attitudes and behaviors toward the flag as evidence, she argues that the flag's removal from capitol grounds was a result of widespread social cognitive learning. The prevalence of terror as a source of learning is potentially destructive, and Annie questions its necessity in the learning process. She discusses the effectiveness of Jane Elliot's "Blue Eyes vs. Brown Eyes" exercise in reducing prejudice and discrimination without inducing terror, but ultimately acknowledges that neither the structured exercise nor the violent shooting brought about enduring change. Annie concludes by claiming that if South Carolina's current race relations are any indication, lessons can be learned overnight, but forgotten just as quickly; the challenge is not in the learning itself, but in actually making enduring changes.

In Grace Mok's essay, *How AP US History Perpetuates Ignorance of Racial Inequalities*, she argues that our history education impacts our knowledge and response (or lack thereof) of racial inequalities. Using AP US History as a demonstrative example, she examines how the selective highlighting and omitting of certain aspects of US history create an overly optimistic narrative of racial progress, one in which racism is only a travesty of the past and not a problem of the present. In turn, she posits that this narrative lends itself to color-blindness, which disregards race as a significant societal characteristic. However, Grace concludes that doing so means failing to acknowledge racial inequalities today, leaving us ignorant and inactive against racism. Grace's provocative essay encourages readers to critically examine the implications of their education-- past and present.

Laura Naslund's essay, *A Different Kind of Drug War: Intellectual Property Rights and the Right to Essential Medicines*, explores intellectual property rights as a barrier to access to

essential medicines in developing countries. It gives this rights crisis a human face through the story of Jairo, an orphan dying from AIDS, who is deprived of life-sustaining medication, at least partially due to the international patent system. After evaluating the theoretical justification of patents and analyzing their actual effects, Laura investigates a movement that empowers universities to use their innovation licensing deals to expand access to essential medicines. She concludes with specific recommendations for reforming this system, as well as a call to elevate access to essential medicines above intellectual property rights.

In Christiana Oshotse's essay, *Addressing the Experiences of Child Soldiers and Gang Affiliated Youth*, she explores how gang-affiliated youth in America and child soldiers in politically unstable regions across the world share similar narratives characterized by extensive push and pull factors that motivate their entry into these violent groups. Consequently, these young adults experience a similar set of psychological effects from participating in acts of violence such as major depressive disorder, anxiety, and behavioral problems. Existing interventions for former child soldiers and gang affiliated youth do not treat these issues with sustainable efforts, failing to address the root causes of why youth seek out violent groups. In addition, Christiana highlights how neither existing interventions nor literature on these topics give equal attention to the experiences of females associated with combat or gang violence. This paper explores these parallels while also stressing the need for further development of research and sustainable interventions that will address the existing structural inequalities that permit these cultures of violence to exist.

Jasmin Jin's essay, *The Issue of Condemnation and Criminality: A Look into "One Big Self,"* explores the larger meaning of C.D. Wright's collection of poetry, and through what techniques this meaning is achieved. In particular, Jasmin's paper looks at the allusions to literary giants Oscar Wilde and Paul Verlaine that Wright has included in her work, and how they contribute to its greater message. She also investigates the larger context of the works referenced— the authors' personal histories and the socio-historical context within which they have produced their art. Jasmin further examines the purpose of the work, the effectiveness with which it is delivered to the audience, and what this reveals about our society at large. This is primarily achieved through Jasmin's comparison of "One Big Self: An Investigation" with other prison literature, paying particular attention to how Wright simultaneously borrows from and restructures this genre.

Spencer Flynn's essay, *Illness Narratives as Empathy Training Tools for Physicians*, is a revealing piece focused on two essential questions: Is empathy an important skill for doctors? If so, how do we improve empathy among physicians? To address these questions, Spencer first summarizes how America's medical philosophy developed towards an ideal of clinical, detached medicine, and systematically addresses the shortcomings of such a system. He then works to construct a new physician ideal, one of biomedical competence fused with empathy, and substantiates a manner of training such physicians - the illness narrative. Arguing that illnesses are far more than physical experiences, and instead affect the whole person, Spencer builds a case that both physicians and patients need a narrative view of illness to cope with and work through the implications of illnesses. He offers simple, practical methods of training medical students to develop illness narrative skills with the hope of better preparing physicians to address the narrative needs of patients. Calling for further research and investigation into the claims and questions that he raises, Spencer strongly states his conviction that such work is necessary as a commitment to a more humane world.

The issue concludes with two research proposals, writing that is usually not published, but rather the precursor to published work. Including the following essays demonstrates the Thompson Writing Program's commitment to providing students a diversity of writing opportunities, including learning how to develop this important, preliminary, and challenging stage of the writing and research process. In Margo Orlen's essay, Feeling Forgetful: Vitamin Intervention to Combat Age-Related Memory Decline, she proposes an investigation of the elusive phenomenon of aging and memory loss through an in-depth look at the extraordinary capabilities of the brain. Her passion for science, and in particular the field of neuroscience, resulted in her exploration of the following important questions. What is age-related memory decline and why does it occur? What has and can be done to try to prevent it? What are the possibilities for further research in the field? Margo also introduces the idea of using everyday vitamins as a means to combat this memory decline.

In Thomas Wang and Tyler Alford-Getchell's co-authored essay, *Anthropogenic Arsenic: A Citizen-Science Based Case Study of Mining, Arsenic Distribution, and Water*, they propose research on the mining industry's effect on arsenic levels in local bodies of water. They establish that past studies have demonstrated that mining correlates with elevated arsenic levels in the immediate areas surrounding these industrial sites, and contend that this research should be taken a step further. Their essay develops a case for why it is important to understand the geographical distribution of these elevated levels in bodies of water. In their proposal, Thomas and Tyler provide in-depth explanations of how citizen science can be used both efficiently and effectively to provide important results on this topic.

Individually and collectively, these essays have definitely pushed my thinking, my emotions, and my teaching, informing my ideas about their various topics, as well as about writing, revising, and collaborating. Each author possesses a distinct voice that comes across loudly and honestly, identifying and sharing with others what the authors think is important, and why, and thus, who they are and/or want to be. By reading these essays you will become part of an ongoing conversation about important and diverse ideas, about how to communicate those ideas in compelling and engaging ways, and ultimately, about how to find and make meaning. I hope that you, too, will be touched or provoked by, resonate or empathize with, and perhaps even be moved to take action as a result of reading the following essays. I invite you to experience these essays both personally and academically, or however you see these two dimensions intertwine. Cheers!

Sheryl Welte Emch, Ph.D.

Sheryl is an instructor of First-Year Writing in the Thompson Writing Program at Duke University. She earned her Master's degree in Higher Education and Student Affairs from the University of Vermont, and her Ph.D. in Educational Psychology from Michigan State University. Her research and teaching focuses on coming of age, specifically how social and cultural factors influence college students' epistemological and personal development. She loves working with and learning rom first-year college students.

Annie E. Janick

While looking through writing classes before my first semester at Duke, it was Dr. Morgan's course title that caught my eye: "How Did You Get So Smart?" it read, rather smugly. I clicked on the synopsis, half-expecting to find confirmation of Duke's reputed elitism in a study technique class, but quickly discovered that the course was an analysis of learning theory. I signed up because of my interest in neuroscience, not knowing just how far-reaching the class topics would be. We each led class discussions on varied topics ranging from education policy to sleep schedules to parental praise and punishment. I learned an important message over the course of the semester: learning is not just a phenomenon that happens in the classroom, but rather a daily rewiring of the brain that pervades every aspect of one's life in unimaginable and profound ways.

The most interesting part of this writing process was seeing how much my ideas changed from September 2015, just three months after the Confederate flag was removed from the South Carolina capitol grounds, to July 2016. Editing the essay during the anniversary of the shooting and Confederate flag removal allowed me to reflect on the events in a new light and in real time as news reporters and local leaders, along with thousands of other South Carolinians, flocked to Charleston. Throughout the editing process, the topic was close not only mentally, but also physically, as I was living just an hour outside of Charleston, which provided another new perspective. Writing and editing this piece was much more than just an introduction to academic writing – it was an exploration of the psychology of decision-making, the cycle of learning and forgetting, and the meaning of my South Carolinian identity. I want to thank my writing professor, Dr. Morgan, my editor, Dr. Emch, and countless friends and family members for helping me recognize the power of writing for communication, self-reflection, and learning – in every sense of the word.

Taking Down the Confederate Flag:
A Learning Process?

Annie Janick

Writing 101: *How Did You Get So Smart*
Instructor: Adrienne Morgan

A running joke in South Carolina is that although we may be at the bottom of a lot of lists, we will always have been the first to secede. Here, the Confederate flag was not left behind in history but rather preserved as a source of identity for many in the state, both white and black. After recent events in Charleston, however, the "heritage not hate" argument lost some of its influence as South Carolinians began to reevaluate the Confederate flag and its function in our state.

In 1961, the 100th anniversary of the start of the Civil War, the Confederate flag was raised over the South Carolina capitol in protest of the civil rights movement ("Confederate flag," 2015). Although much changed over the next 50 years, the Confederate flag's presence remained constant, unshaken by the occasional half-hearted dispute over its meaning. However, these tiffs recently escalated into a national outcry when Dylann Roof killed nine African Americans at an African Methodist Episcopal church in Charleston, SC and was later found pictured with and vehemently defending the Confederate flag on his white supremacist website ("Terrorist Dylann," 2015). Suddenly and embarrassingly, the state capitol found itself linked to a murderer. Faced with intensifying race relations and a nationwide call for the flag's removal, South Carolina politicians voted to transfer the Confederate flag from the state capitol to a nearby museum. Large companies, including Walmart, Target, and Amazon, stopped selling the flag, and many people who previously supported it also reversed their position after the shooting. While the Confederate flag's staunch supporters still refuse to give up their cause, state and national leaders have called the flag's removal a sign of healing and a step towards the end of racism in a historically fractious state ("Confederate flag," 2015).

Even before the Charleston shooting, violent racism was not even a lifetime away for many South Carolinians. In 1961, the Friendship Nine were imprisoned and sent to a work camp after a sit-in and three Freedom Riders were attacked just outside of my hometown. In 1968, college students at South Carolina State University were killed and wounded in the Orangeburg Massacre, a tragedy my 8th grade teacher personally recounted for us in class, in addition to my school district's painful integration that started that same year. In 2015, Walter Scott was shot and killed by a white police officer while fleeing from a traffic stop in North Charleston, SC, which became part of the national narrative of racial police brutality that so many whites try to ignore or rationalize (D'Andrea & Daniels, 1999). Although many South Carolinians have become numb to today's more implicit, systematic racism, the overt violence of the Charleston shooting evoked flashbacks to the civil rights era that were jarring enough to catch people's attention. The shooting's

association with the Confederate flag brought the flag's inherent racism into conscious awareness, and whether it was people's first encounter with this notion or a resurfacing of suppressed knowledge, many people, including South Carolina lawmakers, reevaluated and ultimately reversed their stance on the flag's function on government grounds.

This change in attitude and behavior is an instance of widespread social cognitive learning (Ormrod, 2016). The horror of the shooting intensified South Carolinians' social identities, which changed many people's *attitudes* toward the Confederate flag. When these new attitudes conflicted with current *behavior* and created cognitive discomfort, many relieved the tension by changing their behavior to align with their new attitude. This cause-and-effect relationship becomes clearer when examining the postulations of and research behind terror management theory and cognitive dissonance.

According to terror management theory, when individuals are reminded of their mortality, they become anxious (Hewstone, Rubin, & Willis, 2002). To relieve this anxiety, most people subconsciously cling to the values of their social group in an attempt to give meaning to their lives and contribute to a legacy that will outlast their physical death (Hewstone et al., 2002). In a recent terror management study, for example, researchers found that people who receive news of a terrorist incident often become more aware of their mortality, which leads them to favor members of their own social group (the in-group) and become more prejudiced against those of the out-group (Das, Bushman, Bezemer, Kerkhof, & Vermeulen, 2009). After the terror of the Charleston shooting, some people defined their in-group by race and became more prejudiced against people of other races. Many whites who identified along racial lines supported Dylann Roof's white supremacist ideology and rallied to keep the flag flying ("Confederate flag," 2015). This racial identity, however, was troubling for most whites because it meant aligning themselves with a murderer.

A qualitative review conducted in the United Kingdom commented on the phenomenon of cross-categorization, that is, the dilemma that arises when people identify with multiple conflicting social groups (Hewstone et al., 2002). The review states that shared or overlapping social membership allows individuals to choose with which social group they want to identify, thus tailoring their primary social identity to the specific situation (Hewstone et al., 2002). Many of the whites who refused to identify

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along racial lines instead embraced their religion and/or sense of morality, both common sources of social identity in the South's conservative Bible Belt. Most people who identified this way showed heightened empathy and support toward the specific victims, who were fellow Christians, and the African American race as a whole. Both of these reactions were attempts to leave a more Christian or egalitarian legacy. One must look only so far as the flowers and banners at Mother Emanuel, the live streams and vigils held across the country, and the mourning and overflowing presence at Reverend Pinckney's funeral to witness these Southern whites' adoption of prosocial attitudes that relieved their anxiety caused by the terror
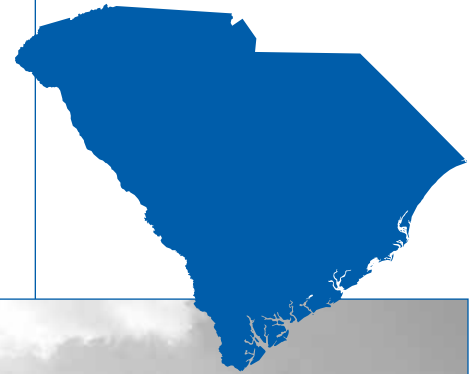
of the shooting (Jarvie & Muskal, 2015; Eligon & Fausset, 2015). By embracing this moral perspective, these whites turned against the Confederate flag in their *attitudes.*

This widespread, renewed mindset, however, caused confusion for those who had previously flown or supported the Confederate flag. Many of these people experienced cognitive dissonance, a feeling of discomfort stemming from inconsistencies between attitude and behavior (Orcullo & San, 2016; Ormrod, 2016). In the case of the Confederate flag, a common inconsistency was that between the morality of Christian teaching and flying or otherwise supporting the Confederate flag in ways such as "singing Dixie and defending [the] right to say the N-word," as well as countless other forms of discrimination and oppression (Kinnard, 2016). This cognitive conflict placed many people at an anxiety-inducing crossroads, unsure whether to change their new anti-Confederate flag *attitude* or old pro-Confederate flag *behavior* to reestablish internal comfort and harmony. At this climatic moment, many South Carolinians were influenced by national leaders' and the media's condemnation of Confederate sentiment (and, thus, condemnation of their *behavior*), which was the final push many needed to change their pro-Confederate flag *behavior* to match their anti-Confederate flag *attitude,* thus making the transition from pro- to anti-Confederate flag complete. A member of the Sons of Confederate Veterans and former Confederate flag supporter put it succinctly: "My Christian duty requires me to call for the removal of the Confederate Battle flag" (Kinnard, 2016). Just like this man, most people are unaware of the subconscious cognitive processes that influence their actions and choices every day, which is just one reason why analyzing decision-making processes is so important.

The removal of the Confederate flag from government grounds was certainly a long-awaited victory for many in South Carolina, but did it really require a shooting for the learning to take place? This sequence of violence and suffering, followed by surges in empathic and moral behavior (such as the various displays of love and support for Mother Emanuel previously mentioned), is not uncommon, but there must be a better way to effect change in widespread beliefs. Further research should be conducted on how individuals and groups can bypass the terror management step of the process and move directly into cognitive dissonance and then empathy and improved relations.

Several methods have been proposed for inducing cognitive dissonance to reduce prejudice, including, most famously, Jane Elliot's "Blue Eyes-Brown Eyes" exercise during which people with brown eyes are told that they are superior to people with blue eyes (Zajac & Henderson, 2009). Although everyone knows that eye color has no bearing on personal qualities, brown-eyed people behave dominantly over blue-eyed people nearly every time, whether they are first graders in a classroom or audience members of the Oprah Show ("The daring racism," 2015). After the exercise and debriefing, most participants become more aware of how easily prejudices and discrimination arise and are subconsciously maintained (Zajac & Henderson, 2009). This awareness then extends beyond the

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exercise as the participants quickly confront the ways in which they may be prejudiced and/or act discriminately in their own lives (Zajac & Henderson, 2009). In theory, this cognitive dissonance brings about changes in behavior that reflect the new attitude, all without the inherent – and destructive – terror phase of the terror management theory.

When put into practice with college students, however, the "Blue Eyes-Brown Eyes" exercise, while often personally meaningful long-term, is only temporarily effective at reducing quantifiable prejudice. According to survey results from an education study, participating in the exercise reduced prejudice for just a little over a year, and watching a video of the simulation had an even more transient effect (Byrnes & Kiger, 1990). Unsurprisingly, this forgetting curve seems to have held true for South Carolinians, too, most of whom experienced the Charleston shooting and Confederate flag debate only indirectly through videos on TV, Facebook, etc., just like the "Blue Eyes-Brown Eyes" control group. Despite the removal of the Confederate flag, little has changed in South Carolina over the last year. It is likely that what had been learned was forgotten because people did not make an effort to consciously retain it once the emotion of the events subsided. Maybe the learning was pushed aside by a newer, more pressing cognitive conflict, or perhaps other events caused a reversal of attitude or behavior. Whatever the reason, the Confederate flag still flies throughout my town, an all-white local church still memorializes the parishioners who fought in the "War Between the States," and Mother Emanuel still lies on a street named for South Carolina's most famous proponent of the slavery-plantation system. Tragically, until we find a way to retain the learning, racism will fill its place.

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Grace Mok

How AP US History Perpetuates Ignorance of Racial Inequalities

Grace Mok
Writing 101: *Land of the Free*
Instructor: Matt Whitt

> Schoolchildren wonder out loud how discrimination could ever have been legal in this great land of ours. Rarely are they told that it is *still* legal.
>
> –Michelle Alexander, *The New Jim Crow*

The Advanced Placement (AP) program, run by The College Board, allows high school students to take college-level courses, which gives them the opportunity to earn college credit based on performance on the AP exam. Whereas only 18.9 percent of graduates in the class of 2003 took an AP exam, nearly 33.2 percent of the graduating class of 2013 took at least one, demonstrating the program's increasing popularity.[1] On its website, the College Board writes that the program will allow one to "stand out in college admissions," "earn college credits," "skip introductory

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[1] College Board, "10 Years of Advanced Placement Exam Data Show Significant Gains in Access and Success; Areas for Improvement," last modified February 11, 2014, accessed November 27, 2015, https://www.collegeboard.org/releases/2014/class-2013-advanced-placement-results-announced.

classes" and "build college skills."[2] For these obvious and intended reasons, many students and parents at high-achieving high schools believe that taking AP classes is necessary to be accepted into good colleges.[3] Most will simply accept the content of AP curriculum as fact. They are unlikely to question what is explicitly and intentionally taught to students—what sociologists call the *formal* curriculum.[4] Even fewer think about the *hidden* curriculum of AP courses—the implicit and sometimes unintentional lessons present and communicated, though not explicitly spoken or written.

Though the idea of hidden curricula usually escapes the attention of laypeople, it often appears in the work of education and sociology scholars. An early leader in sociology, Emile Durkheim, argued that the popular classical education in 17th to early 20th century France implicitly inculcated support for the Catholic Church.[5] More contemporary scholars have examined the hidden curriculum in the classroom structure itself. For example, some claim that row-by-row seating arrangements promote individualism.[6] Still others have analyzed history textbooks—important components of the formal curriculum. In her 1979 article "Ideology and United States History," Jean Anyon, an education scholar, analyzed the portrayal of economic and labor history in widely used high school United States history textbooks.[7] Anyon argued that by highlighting the success of reform legislation and omitting serious discussion of socialism, the textbooks supported capitalism.[8] Though these hidden curricula are not all necessarily bad, it is imperative to acknowledge that they exist.

While other US History courses likely promote the same hidden curricula as AP US History, I will focus my analysis on the AP course because it is standardized and popular. By highlighting and omitting specific parts of history (the same mechanisms that Anyon points out), AP US History promotes its own hidden curriculum: ignorance of racial inequality. It builds this ignorance by constructing an overly optimistic narrative of racial progress, which claims that race relations were unequal, but are now fair. This narrative encourages the belief that race no longer matters, and that we shouldn't see "any color, just people."[9] But failing to see race means failing to see—and therefore, address—the racism still rampant in our society. In other words, color-blindness leads to ignorance. If ignorance is part of the hidden curriculum of an exam taken by over 450,000 students yearly, we would be wise to examine it further.[10]

Examining the Curriculum Framework of AP US History

To begin, it is important to understand how the College Board uses the Curriculum Framework to standardize the course.[11] The Curriculum Framework, created by the College Board, "defines concepts, skills, and understandings required by representative colleges and universities for granting college credit and placement."[12] Specifically, the Framework denotes recommended instructional times and underlines Key Concepts. Recommended instructional times are

2 College Board, "Explore AP," accessed December 4, 2015, https://apstudent.collegeboard.org/exploreap

3 Mollie K. Galloway and Jerusha Connor, "Perpetuating Privilege: Students' Perspectives on the Culture of a High-Performing and High-Pressure High School," *The Educational Forum* 79, no. 2 (2015): 104, 106

4 "Hidden Curriculum Definition." The Glossary of Education Reform. 2013. Accessed June 24, 2016. http://edglossary.org/hidden-curriculum/.

5 Jean Anyon, "Ideology and United States History Textbooks." Harvard Educational Review 49, no. 3 (August 1979), 362.

6 Massialas, Byron G. 1996. "The Hidden Curriculum and Social Studies." *In Critical Issues in Teaching Social Studies, K-12,* 63.

7 Jean Anyon, "Ideology and United States History Textbooks." Harvard Educational Review 49, no. 3 (August 1979), 361.

8 Ibid., 379.

9 Eduardo Bonilla-Silva, 2014. "The Strange Enigma of Race in Contemporary America." *In Racism without Racists: Color-Blind Racism and the Persistence of Racial Inequality in America,* 1.

10 College Board, 2014. "AP Exam Volume Changes (2004-2014)," last accessed July 24, 2016, http://media.collegeboard.com/digitalServices/pdf/research/2014/2014-Exam-Volume-Change.pdf.

percentages of time teachers should allot to different historical periods, equal to their representation on the AP exam. Key Concepts are important concepts integral to performance on the test. This combination of recommended instructional times and Key Concepts clearly indicates to teachers *how long* they should teach a topic and *what* to teach on a topic. These recommendations from the Framework are reflected in the textbooks on the example textbook list, which "meet the curricular requirements of AP United States History."[13] Finally, requiring courses to undergo an AP Course Audit before receiving the AP designation transforms College Board "recommendations" into mandates. In other words, to maximize its chances of receiving the AP designation, a school will likely follow all of the recommendations as precisely as possible.[14] The audit guarantees that all AP US History classes are more or less the same—teaching with the same recommended instructional times and the same Key Concepts set forth in the Curriculum Framework.

Reproduced in every AP US History classroom, the Curriculum Framework naively promotes the narrative of racial progress. It does so by failing to strongly support its main Key Concepts on the civil rights movement. Presenting a balanced and reserved view, the main Key Concept states that the civil rights movement "achieved some legal and political successes in ending segregation, although progress toward racial equality was slow."[15] The successes of the civil rights movement are accurately acknowledged without being overstated, and thus this *main* Key Concept does not promote an overly simplistic narrative of racial progress. In contrast, the *supporting* Key Concepts fail to provide specifics to flesh out the limitations of the movement promoting the narrative of racial progress. One supporting Concept states, "The three branches of the federal government used measures including desegregation of the armed services, *Brown v. Board of Education,* and the Civil Rights Act of 1964 to promote greater racial equality."[16] Essentially, it emphasizes specific, successful turning points in the progress toward racial equality. Students will likely be expected to memorize these exact events for the exam, since they are explicitly mentioned in the Framework. Another supporting Concept states, "Continuing resistance [to civil rights movements] slowed efforts at desegregation…" With ambiguous language, it obscures the specific events that caused the movement to falter. For example, urban desegregation stopped as a result of *Milliken v. Bradley (1974),* and the success of the civil rights movement was reversed partially due to direct and often violent white opposition.[17] Students are probably *not* expected to learn about these specific

11 College Board, "AP United States History: Course and Exam Description," last accessed December 4, 2015, https://secure-media.collegeboard.org/digitalServices/pdf/ap/ap-us-history-course-and-exam-de-scription.pdf.; College Board. "AP United States History: Example Textbook List." College Board, accessed 11/27, 2015, http://www.collegeboard.com/html/apcourseaudit/courses/us_history_textbook_list.html.

12 College Board, "AP United States History: Course and Exam Description," last accessed December 4, 2015, https://secure-media.collegeboard.org/digitalServices/pdf/ap/ap-us-history-course-and-exam-description.pdf.

13 College Board. "AP United States History: Example Textbook List." College Board, accessed 11/27, 2015, http://www.collegeboard.com/html/apcourseaudit/courses/us_history_textbook_list.html

14 College Board, "AP United States History: Course and Exam Description," last accessed December 4, 2015, https://secure-media.collegeboard.org/digitalServices/pdf/ap/ap-us-history-course-and-exam-description.pdf., 22.

15 Ibid., 79.

16 Ibid., 79.

17 Ibid., 876; Orfield et al., "Deepening Segregation in American Public Schools: A Special Report from the Harvard Project on School Desegregation," 6.

events. As a result, it is easy to believe that the civil rights movement was completely successful and that the narrative of racial progress is entirely true. Taken together, these two supporting Key Concepts create a one-dimensional narrative of racial progress, in which the march toward the "equality" of today has been linear and without complications. In reality, while *some* progress has been made, it has not been nearly enough.

The specific recommended instructional times and specific Key Concepts directly impact what students learn, since teachers focus more on topics emphasized on tests.[18] Thus, one lesson communicated by the lack of significant instructional time and relevant Key Concepts on modern history (1980-present) is the narrative of racial progress. The College Board recommends that teachers spend 15 percent of their instructional time on the date range 1945-1980, the time period of the purportedly successful civil rights movement, but just 5 percent for modern history.[19] Of course, one cannot expect a US history course to spend half its time covering modern history. However, given the direct influence of the last 35 years on current events, it would behoove the College Board to recommend a more significant amount of instructional time on recent history. Since modern history represents so little of the exam material, it is likely skipped since teachers may deliberately choose to focus on more frequently tested time periods or simply run out of time to cover it. The lack of attention paid to modern history—and discussions about current racial inequality that might come with it—emphasizes the overly optimistic narrative of racial progress regarding the civil rights movement.

Even if teachers spend the allotted 5 percent on modern history, no Key Concept can be found regarding the alarming recent trends of mass incarceration and resegregation in schools and communities.[20] Not a word on how "one in three African Americans will serve time in prison if current trends continue" and when released will often be "denied the right to vote, excluded from juries, and relegated to a racially segregated and subordinated existence."[21] Not a word on how 60.5 percent of white kindergartners attend schools with a less than 25 percent minority population while "more than half of black and Hispanic students are in schools with a very high proportion (more than 75 percent) of minority students."[22] Although schools are less segregated than they were before *Brown v. Board of Education,* they are still far more racially divided than the narrative of racial progress would have us believe. The lack of significant instruction on modern history and current events contributes to the invisibility and ignorance of current racial inequalities. Thereby, it allows the narrative of racial progress—and thereby, racism—to go unchallenged. How can the next generation of Americans confront racism, when its survival into the present is not even acknowledged?

18 Laura S. Hamilton and Brian M. Stecher. 2006. *Measuring Instructional Responses to Standards-Based Accountability:* RAND Corporation.

19 College Board, "AP United States History: Course and Exam Description," last accessed December 4, 2015, https://secure-media.collegeboard.org/digitalServices/pdf/ap/ap-us-history-course-and-exam-description.pdf., 22.

20 Ibid., 84-89.
    For additional information about the problems of mass incarceration and resegregation, see: https://www.aclu.org/issues/mass-incarceration and http://www.gao.gov/assets/680/676745.pdf.

21 Ibid., 4; Michelle Alexander, *The New Jim Crow: Mass Incarceration in the Age of Colorblindness,* 9.

22 Emma Garcia and Elaine Weiss, "Segregation and Peers' Characteristics in the 2010-2011 Kindergarten Class: 60 Years after Brown v. Board" (Economic Policy Institute, June 11, 2014): 8, http://www.epi.org/files/2014/epi-segregation-and-peers-characteristics.pdf.

The Narrative of Racial Progress: Implications

Believing in the narrative of racial progress makes one likely to subscribe to the ideology of color-blindness, the belief that race is no longer a significant characteristic for understanding society.[23] The narrative of racial progress contends that we used to be racist, because we judged and discriminated against other people on the basis of race. Now, however, according to color-blind ideology, we have successfully overcome racism by avoiding the criterion of race, because we have realized that it is not a meaningful component of identity. Essentially, advocates of color-blindness believe that not taking race into account is the best method to treat everyone equally. They claim that they cannot be racist if they do not explicitly use race as a criterion for judgment. For some, merely acknowledging race is considered racist[24] because race does not, and should not, matter—at least in the happily-ever-after of the narrative of racial progress, where inequality and racism have been eradicated.

Despite its appeal as a solution, color-blindness only perpetuates racism by creating ignorance. One way it does this is by hiding implicit racial biases. Even if we claim not to acknowledge race, truly not seeing race is physically impossible for most people. As a result, we may still have implicit and unconscious racial bias, despite explicit and conscious beliefs about egalitarianism. In one study, for example, internal and emergency medicine residents had no explicit racial preferences, but still had significant pro-white implicit bias, which caused physicians to treat people of color worse than whites. But addressing these implicit biases is impossible under the framework of color-blindness, which does not acknowledge that race is still a significant characteristic. In order to address these implicit biases, we must be first be aware that race still matters. However, AP US History's narrative of racial progress and resultant color-blindness denies this fact, thereby making us ignorant of the implicit biases that continue to perpetuate racial inequality today.

Another way color-blindness creates ignorance is by making the use of racial labels taboo, deeming them "unnecessary." We prefer to explain problems not in terms of race, but in terms of other inequalities, like wealth or education, or in terms of personal choice. While socioeconomic and personal factors certainly play a role, this reluctance to use race prevents us from properly diagnosing and thereby, fixing social problems. One example is the disproportionate mass incarceration of black and brown people. In explaining mass incarceration, color-blind students may explain the disparity simply as a problem of poverty that causes black and brown people to use more drugs. In reality, although people of all races use drugs at similar rates, black and Latino people make up three-fourths of those imprisoned for drug offenses.[27]

Color-blind students prefer to see incarcerated "black and brown men not as black and brown, but simply as men—raceless men—who have failed miserably to play by the rules the rest of us follow quite naturally," thereby failing to see the racial nature of the problem.[28] This color-blind ignorance of the racial aspects of these problems is a surprising, hidden, and harmful addition to the knowledge and skills that the College Board purports to bestow upon AP students.

Conclusion

Upon reading this paper, one might think that the College Board is a malevolent corporation and that all hidden curricula are harmful. After all, I argued that the College Board perpetuates ignorance of racial inequalities through the mechanisms of standardization, highlighting and omitting. However, hidden curricula and their mechanisms are inevitable aspects of teaching history, and all disciplines, regardless of whether the College Board designs it. There is generally agreement that certain parts of history must be taught, so they are included as standards and considered expectations. We simply cannot endlessly examine every past event; instead, we selectively highlight and omit aspects of history. As a result, hidden curricula constantly emerge—purposefully or not— from our collective decisions to standardize, highlight and omit. Some of them, like the ignorance of racial inequality are profoundly detrimental. Others, like the condemnation of totalitarian regimes when

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23 Bonilla-Silva, "The Strange Enigma of Race in Contemporary America.", 2

24 Michael I. Norton and Evan P. Apfelbaum. "The Costs of Racial "Color Blindness"." *Harvard Business Review,* July/August 2013. Accessed July 24, 2016. https://hbr.org/2013/07/the-costs-of-racial-color-blindness.

25 Alexander, *The New Jim Crow: Mass Incarceration in the Age of Colorblindness.*, 243.

26 Elizabeth N. Chapman, Anna Kaatz, and Molly Carnes. "Physicians and Implicit Bias: How Doctors May Unwittingly Perpetuate Health Care Disparities." Journal of General Internal Medicine 28, no. 11: 1504-10. Accessed July 24, 2016. doi:10.1007/s11606-013-2441-1.

27 Alexander, *The New Jim Crow: Mass Incarceration in the Age of Colorblindness.*, 98-99.

28 Alexander, *The New Jim Crow: Mass Incarceration in the Age of Colorblindness.*, 241.

discussing World War II, are not. However, because they *can* have covert, negative effects, we need to constantly uncover and evaluate *all* possible hidden curricula. We should ask two questions: (1) Are they accurate? and (2) Are they beneficial? Regarding ignorance of racial inequality, my answer to both is a resounding "No." Claiming that we successfully combatted racism in the past and that race is no longer meaningful is both inaccurate and harmful.

So, what should teachers and students do about ignorance of racial inequality? A simple answer would be to expect students to specifically know how and why the civil rights movement was not entirely successful and incorporate more recent history on racial inequality. But there are likely many other harmful hidden curricula that lurk in our teaching of US History. Since a single course can only incorporate so much, trying to adequately correct all of these harmful hidden curricula seems impossible. Practically, we must make hard decisions about what we want to address in our history. To do so, however, requires that we begin by uncovering and evaluating the merits of hidden curricula. Only through this clearer and fuller understanding can we truly acknowledge that history is always political. Failing to critically examine our education would cause us to be blindly guided by hidden curricula. Critical analysis is a college skill, one that needs to be applied to the courses themselves.

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Laura Naslund

A Different Kind of Drug War:

Intellectual Property Rights and the Right to Essential Medicines

Laura Naslund
Writing 101: *The Courtroom, Bodies, and the Law*
Instructor: Jennifer Bowles

His name is Jairo. He is twelve years old, and he is dying from AIDS. In an interview with a documentary crew, he declares that his favorite superhero is Spiderman and insists that he only eats sweets. He lies on a floral quilt, too weak to move. His bones, unable to carry the weight of his body, bulge uncomfortably through his skin. Every adjustment of the blankets around him produces a pitiful whimper as the fabric grazes his open sores. Jairo, an AIDS orphan, is at the mercy of an international patent system that restricts his access to AIDS medication, by allowing drug manufacturer Pfizer to charge $27 for a single pill he needs daily. In his native country of Honduras, the government cannot afford to subsidize this medication and his uncle cannot afford to purchase it out-of-pocket with his weekly salary of $90 (Skimkin & Woods 2005). Jairo is just one face of a human rights crisis, aggravated by the abuse of intellectual property law, wherein one in three people globally lack adequate access to essential medicines (Sellin 2014).

Access to Essential Medicines as a Human Right

Essential medicines are defined by the World Health Organization (WHO) as those that "satisfy the priority health care needs of the population" (WHO 2002, p. 1). As the priority health care needs of a population vary by region, essential medicines vary by region as well. Classifying access to essential medicines as a right may be justified by both Article 25 of the Universal Declaration of Human Rights—"Everyone has the right to a standard of living adequate for the health and well-being of himself and of his family, including…medical care…" (UN Universal 1948)—and Article 12 of the International Covenant on Economic, Social and

Cultural Rights—"the right of everyone to the enjoyment of the highest attainable standard of physical and mental health" (UN International 1966). The right to access to essential medicines is not explicitly stated in either declaration. In subsequent General Comments, however, which are issued to aid signatories in interpreting the language of the initial document, access to essential medicines is clearly articulated as an indispensable element of the right to health. As the United Nations Economic and Social Council declared, "The starting point for a consideration of the operational aspects of IP systems with regard to access to drugs is that access to essential drugs is a human right" (UN Doc 2001, p. 13).

Intellectual Property Rights and Access to Essential Medicines in the Developing World

Satisfactory access to essential medicines, as defined in international agreements, has three characteristics: availability, accessibility and acceptability. Included in the requirement for accessibility is the requirement for economic feasibility: patients must be able to reasonably afford essential medications (Sellin 2014). A 2015 study evaluating the relationship between strength of intellectual property protection in developing countries and access to essential medicines revealed a significant, negative correlation between the two. As intellectual property protection increases, access to essential medicines decreases, even after controlling for GDP and relevant demographic characteristics (Jung & Kwon 2015). The authors of this study attribute this negative relationship to the delay in the production and import of cheaper generic versions of essential medicines caused by patent-granted monopolies. In Jairo's case, the AIDS medication he needs, Fluconazole, costs only 30 cents in neighboring Guatemala because the country's patent protection of this compound allowed for the market entry of a generic manufacturer.

Intellectual Property Rights for Pharmaceuticals: In Theory and in Practice

The recognition of access to essential medicines as a right does not necessitate the exclusion of intellectual property rights or undermine their utility in developing fair economic practices in the developing world. The underlying justification for granting temporary monopolies through intellectual property law is the Lockean principle of right to property as a natural law right. Advocates of this system argue that the patent system not only abides by the social contract, but also originates from its ideas. Patents provide incentives for innovators to share their innovations, which may benefit society at large (Kuanpoth 2010). Under this framework, patents do not remove knowledge from the public domain, as that knowledge did not exist previously. Furthermore, the award of patents obliges the patent owner to disclose information about his invention, which eventually enters the public domain for use in future innovation (Sellin 2014).

In practice, however, granting temporary monopolies does not always align with its theoretical justification, particularly with applications in a pharmaceutical context. One of the most widely dispensed justifications for patent protection for pharmaceuticals is the necessity

of drug manufacturers to be able to recoup research and development costs to encourage innovation. Currently, pharmaceutical companies must invest an average of 10 to 15 years in development and $800 million in research costs to pioneer the creation of a new drug, otherwise known as an innovator pharmaceutical. Pharmaceutical manufacturers seeking patent protection argue that without a temporary monopoly, another company could simply copy the original innovation. In doing so, this other company could take over the market by lowering the price of the compound, because it would not have to price the product with both the goal of recouping research and development costs and turning a profit. Patents are predicated on the idea that granting a short-term monopoly prevents the development of a more permanent one in the future, as a consequence of this initial innovation copying.
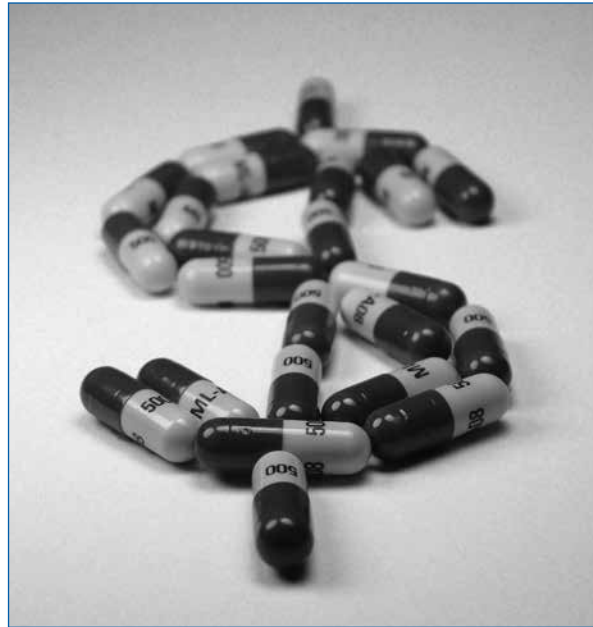
There are two important caveats to the argument that patents are necessary to encourage innovation in the context of pharmaceuticals in developing countries. The first is that a significant portion of the research that is done in developing drugs is funded publicly. A 2011 study evaluating the respective roles of public and private research in pharmaceutical development found that 47.8% of drugs approved by the FDA between 1988 and 2005 cited either a public-sector patent--one in which a government agency holds the patent--or a government publication in their patent applications (Sampat & Lichtenberg 2011). While this is a striking number, it does not fully capture the depth of public contribution to drug development. Much of the basic biological knowledge and research tools applied to drug development are the direct results of public research. In this way, increasing intellectual property protection will not necessarily result in more novel drugs by encouraging private investment in research and development, as much of the pivotal research in drug development is publicly funded (Sellin 2014).

The second qualification is that although patent protection may encourage investment in pharmaceuticals that have a substantial potential to make money, it does not encourage investment in pharmaceuticals whose market potential is limited. Such is the case for the market for essential drugs in developing countries, a market in which consumers cannot afford the product. According to Médecins San Frontières, 90% of the world's health research and development spending is directed towards conditions that only affect 10% of the population (Jung & Kwon 2015).

Priority is given to conditions whose sufferers have the funds to afford treatment. Increasingly, this means funneling money into the development of "lifestyle" drugs such as eyelash lengtheners and erectile dysfunction medications that do not cure diseases or alleviate pain. As a consequence, pharmaceutical companies do not innovate for diseases that disproportionately affect impoverished patients, such as HIV/AIDS, tuberculosis, and malaria. For these neglected diseases, publicly-funded research is even more critical. The 2011 study evaluating the role of publicly funded research in drug development found that 64.5% of priority-review drugs--those which represent a major improvement or new innovation-- significantly relied on publicly-funded research through public-sector patents or government publications (Sampat & Lichtenberg 2011). This finding further gives credence to the argument that strengthened intellectual property rights will not result in more innovation for essential medicines in developing countries where a profitable market is nonexistent (Lezaun & Montgomery 2015); however, increased public funding for research likely will.

The Globalization of Intellectual Property Rights

In order to understand the current state of affairs in the international patent system it is important to set it within its historical context. With the close of the Industrial Revolution, as countries transitioned to a global information economy, the need for standardization of intellectual property protections across countries became increasingly clear. For example, in France in the late 1800s, innovations publicly available elsewhere in the world were not eligible for patent protection, while in the United Kingdom, a similar rule did not apply (Kuanpath 2010). This inconsistency put foreign innovators at a disadvantage in certain countries and stifled innovation by limiting technology transfer across borders. In an effort to alleviate these disparities, the Paris Convention for the Protection of Industrial Property was called in 1883 to begin the process of establishing international protections (Campbell 2003). This convention underwent several rounds of revision, culminating in the Agreement on Trade-Related Intellectual Property Rights (TRIPs) in 1995, which set minimum standards for national patent protection as requirement for membership in the newly developed World Trade Organization (WTO). Under the TRIPs agreement,

signatories must establish minimum patent protection for products in all fields, including pharmaceuticals.

Until fairly recently, many countries excluded pharmaceutical products from patent protection (Jung & Kwon 2015). TRIPs, however, stipulates that pharmaceutical innovations must be eligible for such protection. Because membership in the WTO is contingent on agreement to all aspects of TRIPS, including domestic patent protection for pharmaceutical innovations, developing countries are forced to allow for pharmaceutical patents. The consequence for refusing such patents is to be excluded from the WTO, which is one of the main forums to address grievances within the international trade system. By refusing to grant pharmaceutical patents, a country also effectively removes its voice in addressing other issues it may have with international trade policy. In this way, developing countries are strong-armed into agreeing to minimum standards that may stifle innovation, as refusal to do so would silence their say in the development of other international trade policies. This somewhat parasitic relationship between the developed countries that write the policy and the developing countries they force to comply can also be observed in the World Bank's assessment that many developing countries agreed to TRIPs "in order to gain concessions from rich ones in other areas of economic activity (or for greater aid)" (Ng 2010, p. 104).

While standardization of intellectual property systems is necessary to facilitate global commerce, pharmaceutical innovations require a fundamentally different regulatory framework, as their products dictate life and death. Pharmaceuticals do not operate by the same free market behaviors as other patentable products. Demand for most products declines with an increase in prices, as consumers can no longer afford or become unwilling to pay for the product at a higher price. Pharmaceuticals differ in their "high degree of inelastic demand (that is, demand not responding, or responding only slightly to changes in prices)" (Kuanpoth 2010, p. 118). As a result, high prices are not enough to discourage consumption, which would consequently lower prices to an affordable equilibrium. In this way, the pharmaceuticals market is particularly sensitive to temporary monopolies through patent protection, as demand cannot provide a check on the inflation of a product's price.

Despite the demonstrated relationship between increased intellectual property protection and access to essential medicines in developing countries, strong advocates of TRIPs insist that the agreement is beneficial to impoverished signatories as establishing minimum patent protection encourages innovation within these countries. This argument ignores the significant barriers to innovation in developing countries caused by a lack of infrastructure. Rather than strengthening patent protection, policies seeking to increase access to essential medicines should be designed with the aim of technology transfer and bolstering local manufacturing potential. In turn, this would reduce

overall pharmaceutical costs by reducing marketing and transportation costs (Sellin 2014).

Effort to Unite Intellectual Property and Pharmaceutical Access Rights

One organization that is focused on increasing access to essential medicines by reducing barriers to technology transfer to developing countries is Universities Allied for Essential Medicines (UAEM). This student-directed movement seeks to impact global access to essential medicines by changing university licensing practices. The founding success of this organization exemplifies the utility of its methods in securing access to essential medicines globally. In 1988, the Yale University technology transfer office issued an exclusive license to drug manufacturer Bristol-Meyers Squibb to commercially produce its antiretroviral compound, stavudine. Under this agreement, Yale made $40 million a year from royalties on this compound alone,
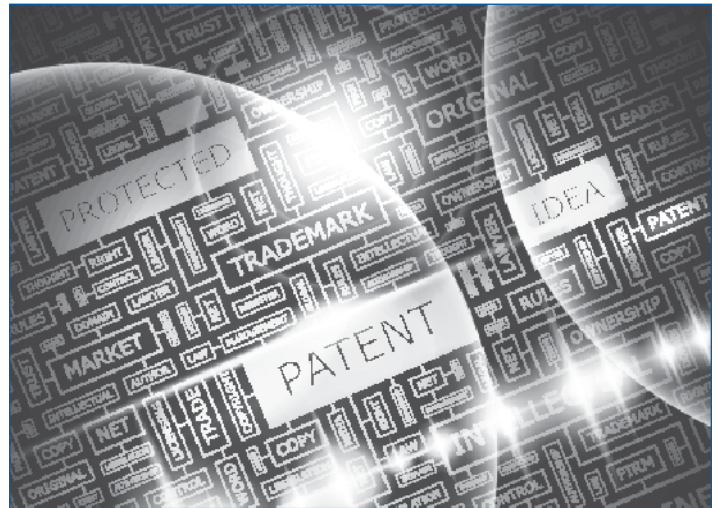
nearly all of the $46.12 million a year made from all of its royalties combined. Under pressure from Yale law students and nonprofit Médicins Sans Frontières, Yale renegotiated the terms of its exclusive license with Bristol-Meyers Squibb to allow for a generic version of the drug to be bought and sold in South Africa, resulting in over a 30-fold reduction in price (Hoen 2013). As Dr. David Chokshi (2006), Assistant Vice President in the Office of Healthcare for the largest public healthcare system in the U.S. remarked, "Rapid expansion of HIV-treatment programs in sub-Saharan Africa would not have been possible without the widespread availability of generic stavudine…" (p. 724). From this initial break-through, UAEM has expanded to include chapters in over 40 research universities, advocating for patent licensing structures that allow for affordable technology transfer to developing countries.

This approach to increasing access to essential medicines, however, is not without its challenges. Although the stated mission of many universities includes a provision

for increasing public good, the funding structure for university research may make university technology transfer offices--those that handle the licensing of intellectual property produced by university researchers--reluctant to enter into more open-ended and innovative licensing agreements from the start. Purely from the perspective of a university's finances, it is better for it to enter into a well-defined agreement with a predictable revenue stream as "you can never be sure as an academic what's going to happen next year [with funding]" (Lezaun & Montgomery 2015, p. 15). Despite the potential conflict between a university's goal of steady research funding and increasing the public good, the UAEM movement is a model for efforts to increase access to essential medicines in the developing world, as it works with intellectual property rights to secure human rights, rather than against them.

Are Intellectual Property Rights Truly Rights?

As the UN Economic and Social Council claims in its report on the human rights impact of TRIPs, "Intellectual property rights are granted by the State according to well-defined criteria and so are more akin to a privilege. They are defined by national legislation…Human rights, on the other hand, are inalienable and universal. They are not granted by the State, they are recognized" (UN 2001). In this way, the UN elevates access to essential medicines as a human right, above intellectual property rights, which it views as a privilege. This view fits into a moral framework, whereby innovators are valued more for their humanity than for their innovations. Currently, however, more money, time, and effort is spent seeking redress for the intellectual property violations of the

AIDS advocates who tried to smuggle affordable Diflucan® from Guatemala than is spent on sustainable access to the medicines for Jairo.

Future Directions: Expanding Global Access to Essential Medicines

While uniting the numerous stakeholders within the international intellectual property system to effect substantive change may prove challenging, there are concrete steps the international community can take to increase global access to essential medicines. To start, disentangling the requirement for stringent, domestic patent protection for pharmaceuticals and membership in the WTO would provide developing countries more leniency. This step would enable these countries to establish technological transfer policies that result in local generic drug manufacturing and, consequently, greater access to essential medicines. In addition, developed countries can provide greater incentives for pharmaceutical companies to pioneer the innovation of drugs to combat neglected diseases. These incentives, combined with the allocation of more public money to fund basic scientific research, would likely result in the development of more potent and cost-effective treatments. Beyond these specific recommendations, however, the international community needs to consciously elevate access to essential medicines—a human right, above intellectual property protection—a human privilege, in policy-making. Lasting change can only be achieved through this ideological transformation. If the international community embraced this moral distinction between human rights and intellectual property rights, children like Jairo would not die for lack of drugs.

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Addressing the Experiences of Child Soldiers and Gang Affiliated Youth

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Writing 101: *The Biocultural Nature of Childhood*
Instructor: Adam Boyette

Youth Involvement in Violence

Young people represent promise not peril. In April 2015, United Nations Secretary-General Ban Ki-moon opened the very first formal debate on the topic of youth involvement in violence across the world echoing this very statement. The daylong debate drew attention to the pressing need to develop approaches aimed at reducing the factors that create environments conducive to gang violence and extremist groups (Security Council, 2015, para. 9-10). Structural factors such as unemployment, poverty, political instability, and violence interact to marginalize individuals, leaving these disadvantaged youth with virtually no choice but to seek security in gangs or extremist groups. These structural issues play a major role in perpetuating the culture of violence in our youth. Even in the most industrialized societies, youth involvement in violence is a critical issue. Children are being forced to mature at an earlier age, lessening the window of childhood experience others enjoy. Not many people realize this, though, causing dangerous narratives to be crafted in the media about wayward youth who choose the path of violence and destruction. The economic maturity that the United States enjoys keeps many from realizing the parallels that exist between youth in urban gangs and child soldiers in non-Western countries. Our research explores the parallels between not only the causes that drive youth to become gang affiliated in Western countries or used as instruments of warfare in non-Western countries, but also the long-term physiological effects experienced by these youth. The experiences of both gang-affiliated youth and child soldiers are extremely nuanced, and as a result, they will be explored separately in an attempt to give equal weight to the lived experiences of each group.

Violence in Urban Settings

Gang affiliated youth engage in a wide variety of activities such as theft, robbery, drug and sex trafficking, and murder. According to Epidemic Intelligence service officer Dr. Dawn McDaniel (2012), gang violence accounted for "20% of homicides in 88% of the largest American cities alone from 2002 to 2006" (p. 253). Children are recruited into gangs at as early as nine years old in certain South American countries, but the average age of entry is 12-14 years old while a gang can span in age from 13-24 years old, with men older than 24 occupying higher leadership positions (Pyrooz et al., 2010, p. 877). Youth are used as drug couriers, watchmen, spies, and assassins, furthering the span of influence community gangs possess.

Christiana Oshotse

Figure 1. Nationwide Gang Presence per Capita per State

While economic disadvantage lies at the heart of gang presence, the patterns of race and ethnicity heterogeneity in a community also strongly influence the formation of gangs and the participation of youth in violence (Pyrooz et al., 2010, p. 872). According to a study conducted on gangs in urban America by Dr. David Pyrooz and his colleagues (2010), those who come from similar backgrounds and endure similar situations tend to coalesce around desires to perpetuate social disorganization through relentless disruption and crime (p. 871). Gangs wage violence against communities, so in the midst of the damage and violence their actions cause, it is easy to miss the brotherhood and hierarchical presence that points towards gang members' desire for family and security. In no way are their actions excusable, but their pride for territorial rights, loyalty to their fellow members, and respect for the established hierarchical protocol alludes to the lacking conditions that initiated their involvement in gangs. Youth without father figures and stable households see gang involvement as a viable, and even desirable, replacement. Likewise, the promise of financial security, group loyalty, and respect entice youth to join gangs.

Table 1. North and South American Risk Factors for Youth and Gang Violence

Societal	• **Culture of violence** • **Poverty and income inequality** • **Rapid and uncontrolled urbanization** • **Youth employment and inactivity** • **Migration** • **Drug trafficking**
Community	• Low secondary school enrollment, completion, and attainment rates • School violence • Availability of firearms
Relationship/Interpersonal	• Household poverty • Dysfunctional families • Peers who are gang members
Individual	• Alcohol abuse • Lack of identity

Note. Reprinted from "Crime and Violence in Central America: A Development Challenge," by World Bank LAC, 2011, *Sustainable Development Department and Poverty Reduction and Economic Management Unit Latin America and the Caribbean Region.*

A comprehensive study of urban violence conducted by the World Bank in 2011 delineates some of the pathways through which youth become involved in gangs. The affected youth grow up watching violence manifest in different ways: gang interactions, drug trafficking, physical, verbal, and even sexual abuse at home, and bullying in schools (World Bank, 2016, p. 18). Many youth in urban areas see participating in this violence as the only way to provide for their family or gain respect. Research conducted through ethnographic interviews by a team of social psychologists elaborates on some of these motivations. According to Seal, Nguyen, and Beyer (2014), avoiding the violence is dangerous and stigmatized; people are

afraid to seem "soft" if they do not align with a gang (p. 7). Some urban youth's participation in violence in their community is self-selective; i.e., they are cognizant that this may be the only way for them to protect themselves.

Children as Instruments in Warfare

The desire to participate in gang violence stems from the lack of educational and employment opportunities and cultures of crime that exist in many neighborhoods. These push and pull dynamics of an environment that compel children to join gangs are also evident in the motivations of child soldiers who become involved in warfare in their countries. By definition, child soldiers are youth under the age of 18 who are involved in warfare in any way - as spies, combat participants, or cooks and porters - on either the side of rebel groups or the government (Denov, 2010, p. 794). Most child soldiers are under 10 years old when they are recruited. They, too, endure devastating factors such as poverty that force them to participate in warfare. However, the United Nations (Office of the Special Representative of the Secretary-General for Children and Armed Conflict, 2015, para. 2) suggests that in certain political conflicts between government and rebel groups, only a very small percentage of children seek revenge against the government and request to join the warfare.

It is important to be clear that there is no such concept as "voluntary enlistment" in warfare for these children. Those who are not kidnapped and beaten into participating join in a desperate attempt to survive. "They give you a firearm and you have to slaughter your best friend. They do that to see if they can trust you. If you don't kill, your friend is ordered to kill you," said Colombie, a seven-year-old boy recruited off the streets by the Democratic Republic of Congo (DRC) rebels (Humanium, 2011, Recruitment of Child Soldiers section, para. 3). Lucien, also an ex-child soldier from the DRC says, "Children, my dear brother, are the best fighters of the century. They have more energy than older people. They resist without feeling physical pain (Humanium, 2011, para. 1). Children are heavily recruited because they are obedient, easily coerced, and can be used for a multitude of jobs (Humanium, 2011, Reasons Child Soldiers are Recruited Section).

While both boys and girls are recruited, the girls experience extensive sexual abuse in conjunction with the physical and emotional trauma experienced by the male child soldiers (Denov, 2010, p. 794). Once these children learn that in order to survive they must take up the fight, they soon become perpetrators of brutal violence. Some even report that the tasks such as killing, burning, and looting become enjoyable, and they take pride in successfully carrying out such orders (Denov, 2010, p. 795). Sadly, regardless of whether or not they ever are desensitized from the violence they experience, reunited with family and community members, the children are faced with a harsh homecoming; they are seen as traitors and murderers, are ostracized and often driven into exile (Denov, 2010, p. 798-799).

Source: *Crip Gang.* [Digital Image]. Retrieved from https://www.flickr.com/photos/

Child soldier in Vietnam, 1968. Not much has changed in war torn regions in the Philippines that still employ the use of child soldiers today. Source: U.S. Signal Corps. (Photographer). (1968, May 7). *Child Soldier in Vietnam War.* [Digital Image]. Retrieved from https://commons.wikimedia.org/wiki/File:Vietnam_child_soldier.jpg

Perspectives on Childhood

The perceptions of childhood are culturally distinct for gangs and child soldiers. Cross-cultural research compiled by anthropologists at Yale conclude that WEIRD (Western, Educated, Industrialized, Rich and Democratic) countries often have a much more prolonged period of childhood that extends into the teen years ("A Cross-Cultural Perspective," 2015). Meanwhile, non-WEIRD countries tend to have a shorter period of childhood, often considering a child of eight or nine years to have reached full adulthood. Regardless of

these differences, the average induction time for both groups is actually very similar. While the absolute ages are different, their relative ages are similar because they correspond with the latter end of each culture's respective concept of childhood. A child who becomes a soldier at age 9 and a teen who joins a gang at age 13 experience violence at the same period of their transition to adulthood even though their numerical ages do not reflect this. These two groups experience a termination of their childhood at the same time. Both gang youth and child soldiers explain how getting involved creates a numbness that perpetuates the violence and reinforces group identification and membership (Bailey et al., 2014; Bayer et al., 2007; Betancourt 2012; Coid et al., 2013). Understanding this is crucial to address the root causes of the violence both groups experience, as well as to provide former gang members and child soldiers with proper and continuous support.

Long-Term Physiological Effects

According to pediatric doctors Helen Pratt and Donald Greydanus (2003), "Gang culture accepts violence as normal behavior, often requires violence to join, uses violence to resolve conflicts, and requires youth to use violence to protect members and display loyalty" (p. 937). In South America, with the highest rates of gang violence recorded in the Americas, 64% of the fatal injuries of gang members in Tegucigalpa, Honduras over the age of 15 occurred due to homicide (Yacoub, 2006, p. 428). Attempts to defend their manhood or seek retribution against another gang play a major role in influencing the prevalence of homicides, suicides, accidental deaths and injuries due to gun violence, car accidents, or drug overdose that many gang members' experience.

Likewise, the experience of child soldiers is ridden with systemic violence that leaves many children maimed or dead. Many child soldiers were simultaneously victims of violence perpetrated by others and themselves; they have experienced shootings and sexual assault multiple times, as well as initiated these same atrocities. A study on former child soldiers in the Democratic Republic of Congo by Bayer (2007) revealed that, "92% of the former child soldiers had witnessed shootings, 54% had killed someone, and 27% had been forced to participate in sexual activities against their will" (p. 555). Many were left with permanent stomachaches from constant rape, and others sustain traumatizing loss of limbs. Child psychologists Steinar Johannessen and Helge Holgersen conducted ethnographic interviews among former child soldiers in the Democratic Republic of Congo. The following excerpt from one child soldier highlights the gruesome nature of these children's experiences: "You have those who come without an arm, for example, because it broke; it was cut off during the war. He has lost an arm [and]

he has lost a leg…When he left, he had no problems; when he comes back, now he no longer has arms, he no longer has feet" (Johannessen & Holgersen, 2014, p. 59).

Child in a rebel camp in the north-eastern Central Africa Republic.
Source: Holtz, Pierre. (Photographer). (2007, June 20). Child Soldiers in Central African Republic [Digital Image]. Retrieved from https://www.flickr.com/photos/hdptcar/949798984/in/photostream/

The unfavorable contextual factors that foster environments of aggression and violence in child soldiers and child gang members influence their psychological states adversely. While trauma is only a small component of a larger set of problems that these children encounter, it is the cause for the majority of the mental health issues many endure years after their experience with violence. In gang violence, anxiety, major depressive disorder (MDD) and Post-Traumatic Stress Disorder (PTSD) are the most unrecognized repercussions of violence. (Bailey et al., 2014; Betancourt, 2013) Studies such as one conducted by Caroline Bailey et al. (2014) examining gang-affiliated youth have revealed intense, "reactive aggression, hyper-vigilance, sleep disruptions and emotional numbing," which are definitive signs of PTSD (p. 199). This is all to be expected because of the stressful environments Sierra Leonean child soldiers endure. These horrible circumstances have left 80% of the girls and 52% of the boys with anxiety, and 72% of the girls and 55% of the boys with depression (Betancourt, 2013, p. 22).

Studies have shown a high prevalence of externalizing problems in correlation with the rate of former gang members that suffer from MDD, anxiety, and PTSD (Bailey et al., 2014; Coid et al., 2013) . Rule-breaking behavior, cruelty towards others, and destruction of property are all tendencies that have been observed. Meanwhile, former child soldiers have a tendency to internalize problems. After conducting a study on guilt and trauma in former Uganda child soldiers, Dr. Fionna

Klassen (2014) concluded that the more trauma children simultaneously committed against others and endured as victims, the deeper they internalized their experiences and the more guilt they felt (p.183). The complex experiences of child soldiers, and their resulting psychological problems, are due not only to the trauma they endure living surrounded by war, but also having to commit violence. As child soldiers transition out of war, they are left with thoughts of the violence committed against them and by them. Therefore, the amount of guilt that these children experience is correlated with the severity of their depression (Klassen et al., 2014, p. 187).

The extent of poor mental health outcomes in former child soldiers and gang affiliated youth depends upon the settings they remain in when no longer involved in wars or gang violence. Post conflict factors, such as immediate environment and employment opportunities, influence the persistence of mental health issues. Experiences with stigma and discrimination affect their ability to adjust to life after exposure to violence. In Uganda particularly, the initial response of the community to the return of child soldiers was often one of fear and distrust (Klassen et al., 2014, p. 191).

Perspectives on Gender

Girls who participate in gang activities or in warfare have been less visible than their male counterparts. "It is estimated that 40% of all child soldiers are girls who are mostly used as non-combatant 'wives' (sex slaves) of the male combatants" (War Child, 2016). In Colombia, the Marxist-leaning groups the Revolutionary Armed Forces of Colombia (FARC) and National Liberation Army (ELN) treated female soldiers as equal to males, while many right-wing paramilitary groups were known to embrace gender stereotypes (IRIN, 2013). For the most part though, female child soldiers occupy subservient roles in the rebel group they are a part of. Upon returning to their communities, males and females were treated with apprehension, with girls frequently seen as sexually promiscuous, defiled, and even untouchable. The stigma attached with not only being a child soldier but also from being raped or sexually abused makes the reintegration of female former child soldiers exceedingly difficult. Many have argued that the disarmament, demobilization, and reintegration initiatives are not equipped to address the needs of girls who have suffered incomprehensible abuse (UNESCO, 2015; Pathak, 2011). The process of systematically disarming and reintegrating former child soldiers does not address the gender specific violence that male and female child soldiers have endured (Pillai, 2008, p.25; Reed, 2010, p. 21). Furthermore, international humanitarian laws fail to recognize and make provisions for girls who were indirectly participating in combat. This is due to major loopholes present in the treaties that do not view roles performed by girls in combat as that of a child soldier, leaving their captors unpunishable by law (Pillai, 2008, p. 25-26). This failure to achieve justice on behalf of these young women and to provide proper intervention programs on their behalf forces them to exist in a society that allows continued violence to be inflicted upon them even after they have left combat.

According to the National Gang Intelligence Center (2013), some investigators estimate that 10% of gangs in America are made up of females (p. 41). Similar to child soldiers, females in gangs occupy subservient roles to the males, serving as mules for drugs, weapons, contrabands, and as alibis, spies, and transportation (NGIC, 2013). Many young girls remain in these degrading situations even after being subjected to severe sexual violence because of their desire to gain membership status into the gang. This leads to rape becoming a normalized occurrence for these women (Townsend, 2012). Gangs take advantage of the fact that females attract less suspicion while committing crimes, using them in indiscriminate and often high risk situations (NGIC, 2013). But this ability for females to remain invisible in the midst of violent criminal activity is what leaves them trapped in cycles of abuse. Frequently, they are either lured into prostitution or grow up amidst the culture of violence as wives, daughters, and sisters. While the female gang members suffer from similar self-esteem, mental health, and behavioral problems as the male members, they are much less likely to receive help because the males are more visible actors in the gangs (Moore & Hagedorn, 2001, p. 9).

Future Recommendations

In order to develop solutions to properly address the circumstances of former child soldiers and gang affiliated youth, the complexity and similarity of their experiences must be understood. It is important that supportive and compassionate environments facilitate their integration back into society. Instances of family and community stigma do not serve to ameliorate the intense mental health issues that child participants and survivors of war and gang violence endure. Counseling, mentoring, and peer support groups are necessary to provide these children with the mental support they need to make a lasting recovery. Moreover, providing more educational and employment opportunities for youth in Western and non-Western countries is important in lessening the violence both parties experience. These are all modes of intervention currently used for former child soldiers and gang members, and they have proven effective in allowing them to reintegrate successfully into their respective communities. In addition to these structural modes of intervention as forms of counteracting the creation of gangs and need of child soldiers in war, there are modes of intervention employed that aim to strengthen the emotional
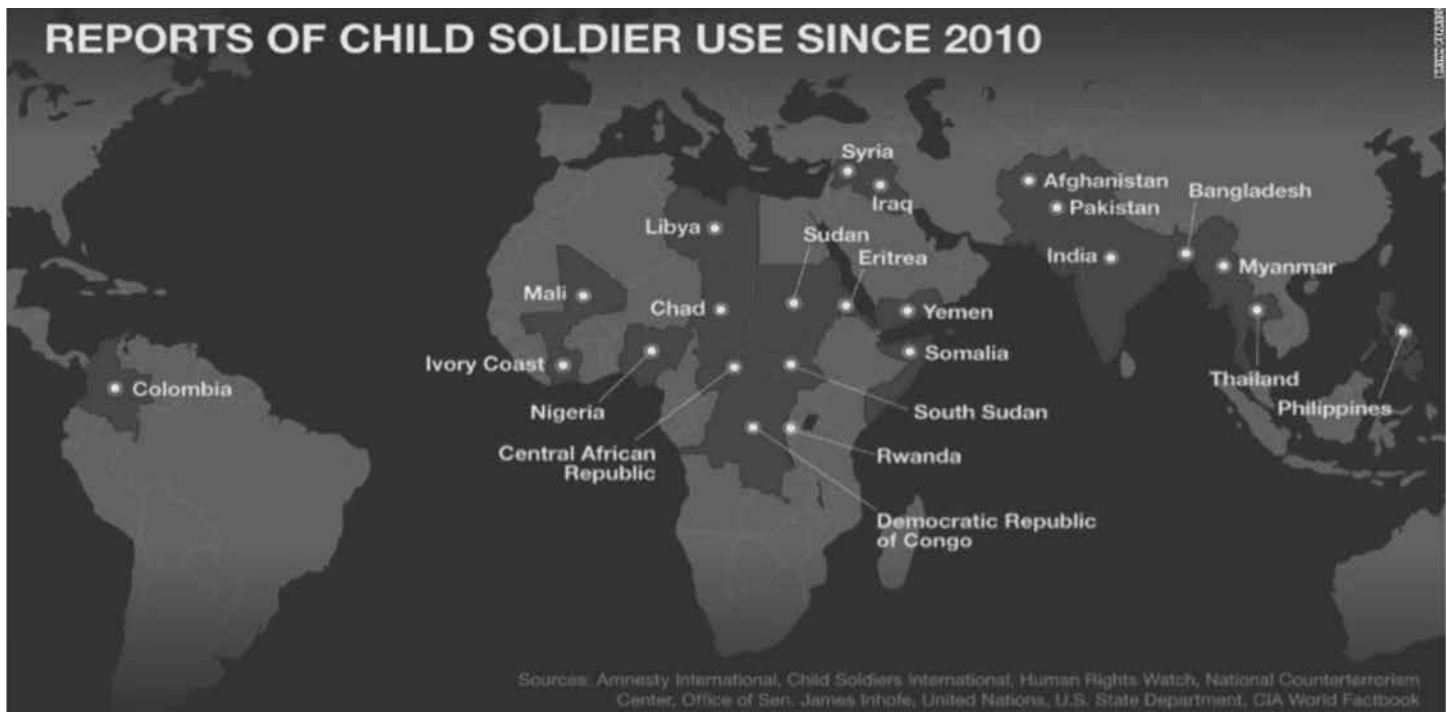
Reports of child soldier use since 2010.
Source: Amnesty International, Child Soldiers International, Human Rights Watch, National Counterterrorism Center, Office of Sen. James Inhofe, United Nations, U.S. State Department, CIA World Factbook

wellbeing of former child soldiers and gang members. Former child soldiers from Sierra Leone expressed the peace and stability they feel from praying, participating in community rituals, and attending schools or programs with those who shared their experience as child soldiers (Denov, 2010, p. 800-801). Former gang members have experienced a successful transition into society with guidance and emotional support of mentors and interventionists. They help them to look for jobs, encourage positive self-image, correct personal behaviors, and reestablish relationships with families and friends (National Gang Intelligence Center, 2013, p. 8).

Counseling as well as educating the community are part of the necessary groundwork to heal these youth. Several gaps exist in the literature about how the experiences of child soldiers and gang-affiliated youth are inextricably tied to the structural failures of their environments. It is not enough to simply provide accounts of these youth's violent experiences. The majority of the publications listed in this paper simply list the 'push' factors that cause children to become either gang members or child soldiers; they are missing detailed analyses of the environments that these children come from, the current issues that contribute to their unstable environments, and how all of these factors interact to cause a child to become a part of these violent groups. Many of the youth who endure these violent circumstances as child soldiers or gang members are predominantly from politically unstable and poverty stricken environments. It is these systemic failures that perpetuate the involvement of youth in violence. More research needs to focus on these issues to emphasize the true causes of marginalization in disadvantaged communities.

While political conflicts, government corruption, and poverty motivate the use of child soldiers in warfare and cause youth to join gangs, resolving these structural issues is immensely difficult. Organizations such as the United Nations, with the capability to influence international human rights laws, have realized the issues that the future will have if the world's youth remain involved with violence. Though the use of child soldiers had been illegal since 2002, countries continue to use child soldiers because of the lax enforcement of these laws. Repercussions must exist when laws such as these are broken, and the institution of a task force committed to holding countries accountable for their actions should be created. Moreover, it is important for structural change to occur in the urban communities in America that are a hub for gang violence. The street economy so many gangs depend on must be de-incentivized. Crimes such as drug trafficking, illegal firearms sales, sex trafficking and prostitution must be treated more seriously. State laws have already been established in some places to combat gang violence in cities, but federal attention from the Department of Justice is needed to foster lasting solutions to these issues. Initially, the experiences of child soldiers and gang involved youth are dissimilar in the circumstances that engender their involvement, but both of these groups have endured a significant amount of stress and disadvantages that have coerced them to be involved in a culture of violence. This thread of marginalization runs through the fabric of their complex situations, and its manifestation is what is apparent in both of these groups' lived experiences. As these similarities in the conceptualization of youth gang violence and urban warfare are acknowledged, hopefully sustainable solutions for both groups can be developed and implemented.

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Jasmin Jin

Just as the name suggests, my Writing 101 class "Extra-Poetic" introduced me to a strange and different world. This world of investigative and experimental poetry has enabled me to pursue two passions of mine: social justice and literature.

Exploring *One Big Self* by C.D. Wright has shaped my worldview in ways that extend beyond traditional classrooms. For my paper, I chose to focus on aspects with which I was unfamiliar. As a poetry fanatic, I was surprised that it had gained a stigma as highbrow art. I was also fascinated that Wright used this medium for a socially conscious message, rather than merely exploring her own emotions and place in the world. There were many allusions (to Wilde and Verlaine) that I had missed during my initial reading, so I decided to do more research. Analyzing not just the texts, but also their historical and social contexts, gave me deeper insight to the meaning and function of this work. This paper also served as an opportunity for me to learn about the problem of mass incarceration and its complicated history. I am now thinking more carefully and deliberately about the prison system and its aftermath. As much as I believe in justice and the law, I believe that there are those who will abuse their power and manipulate the weak. There are flaws in the system that cannot be ignored. These issues lie beyond partisanship—in the realm of human rights.

I am grateful to Stefania, for her enthusiasm, sensitivity, and encouragement. I would also like to thank Sheryl for being a meticulous editor and patient guide, and the Deliberations Board for providing me this opportunity.

The Issue of Condemnation and Criminality:

A Look into *One Big Self*

Jasmin Jin
Writing 101: *Extra-Poetic*
Instructor: Stefania Heim

Mass incarceration in America is an immense problem, especially as the number in prisons continues to grow. Once the jailed cross the line between the free world and steel bars, they are too easily forgotten; their existence is reduced to a mere statistic. When the lives of these prisoners and the history of prisons are filtered through the eyes of a poet, a work that meets the intensity of investigative poetry is born. Investigative poetry is a field in which poets do research and hone in on a subject, exploring larger ideas and issues. C.D. Wright does exactly this in her collection of poetry *One Big Self: An Investigation.* In her work, she sets out to accomplish an ambitious task: to capture the true selves of these prisoners and, in the process, advocate for prison reform. Wright's experimental and captivating style consists of various figurative language interspersed with verbatim quotes from the prisoners of Louisiana whom she interviewed. While the genre of "Prison Poetry" is not in itself groundbreaking, the political purpose for which Wright makes use of this medium sets her work apart.

The relationship between art and prisons is one that has been previously explored by other artists. Acknowledging the tradition she draws from, Wright makes several allusions to other "prison poets" throughout the book. In her poem "On the road to St. Gabriel", she describes one of the prison women she interviewed. She writes that this woman "knows/ *le ciel est, par-dessus le toit*/ She knows NOTHING AND NO ONE IS BAD FOREVER" (Wright 20). This is Wright's homage to the French symbolist poet Verlaine, whose own time in prison served as inspiration for

his collection of poems *Sagesse*. The phrase *"le ciel est, par-dessus le toit"* is a line from Verlaine's poem of the same title. It serves as a recurring motif throughout the book, showing up in three instances (pages 20, 35 and 53). According to a translation put together by Bernhard Frank, the phrase can be translated to "There is a sky above the roof". In the poem, the speaker describes the sky that can be seen from his prison cell. He sees the "blue" sky, hears a "bell" ring, and a "bird" sing. The "b" alliteration adds a mellifluous quality to the poem. The speaker also describes the beauty of nature and the "gentle murmur" (Frank 93) of those who are free, all of which makes him hyper aware of the divide between his prison and the outside world of normalcy. The "window" is a symbol through which he can sustain his dreams. In "On the road to St. Gabriel", Wright carries this allusion further with the line "An old lover punched out a wall for a window" (Wright 20). This hole in the wall serves as a "window" for Wright's speaker, just as the roof of the prison serves as a "window" for Verlaine's speaker to see the outside world. However, the romantic image of a "window" that gives vision is spoiled when one thinks of the "window" in Wright's poem as having been born out of brute force.

Verlaine's speaker goes on to mourn his wasted youth and innocence, and regrets the decisions he has made in his life, especially those that have led to his imprisonment. The joy, the sadness, the pastoral scenes of the outside world no longer belong to him. This deep regret and longing for what is lost pervade the poems in Wright's work. These prisoners have lost access to basic amenities such as privacy and connections to their family members. They have been virtually erased from the memory of "free" citizens. While the speaker of Verlaine's poem weeps for his bygone youth, the speaker of Wright's poem "Leaving St. Gabriel" does not weep. She is angry and resentful, and critical of all the wrong turns she has taken to get to where she is now. She rhetorically asks: "Why does it take so goddamn long…all the ugly run-over shoes, the thousand stupid things you wanted (others had them); the carcasses of your young dumb dreams strewn all over the slithering hills" (Wright 56). She looks back on her youth with disappointment, scorning the futility of it all. In the end, no matter how badly she wished and dreamed and longed, her hopes were all annihilated. The diction of "carcasses" evokes a tone of violence and conjures up a visceral quality. The sibilance in "slithering" creates a quietly menacing atmosphere; the hissing sound is associated with a rattlesnake, a dangerous creature that can bite and inject poison without warning. The "d" alliteration in "dumb dreams" creates a dull sound that emphasizes the two words, adding ammunition to the sting of regret. The "st" sound carried throughout these lines ("stupid" and "strewn") create a dissonance, a jarring cacophony. The image of "ugly run-over shoes" intimates poverty, as if everything in her life were saturated with this grimness and squalor. A resistance to beauty began long before she even entered the prison.

While the speaker in Verlaine's poem sees the pleasantries of outside, the speaker of this poem sees only the harshness that surrounds the prisoners in their grey, steel prisons. In another allusion to Verlaine in Wright's poem "Black is

the color", the speaker says: "Mercy Triumphs Over Judgment/ as the saint would have it/ I know that, and I know *Le ciel est, par-dessus le toit,/ Mais apres tout,* I'm not Verlaine" (35). The religious slogan "Mercy Triumphs Over Judgment" means nothing to the speaker, because she has not been granted mercy. This is the difference between theoretical knowledge and lived experience. The system has rejected her, throwing her in this cell. A judgment has been made, and she has been locked up as a result. The speaker also knows that yes, there is another world outside these bars; there is a sky above the roof that could have belonged to her in another life. The line *"Mais apres tout* (But after all), I'm not Verlaine" shows her disillusionment with her situation. It is almost as if she shrugs her shoulders, and says, "So what? What does any of this mean to me? What use is it to paint pretty words?" Upon accepting her fate, she has given up everything else, including hope. The lines that follow are: "Bound her hands with electrical cord, the young mother of three/ Stabbed her…took her wedding ring" (35). The horror, gore, and abuse that permeate these lines stand in stark contrast with the soft, harmonious yet sorrowful image of Verlaine's poem. While Verlaine can craft beautiful lyrics in the setting of a prison, the speaker does not see how her situation can lend itself to such art. She does not, or cannot, romanticize her experience. Certainly the lives of these prisoners are ridden with violence and poverty, and prisons are not exactly fertile ground for breeding optimism. In this way, Verlaine is more akin to Wright, who crafts prisoners' stories into art, than the prisoners themselves, who are forced to remain here for infinite time. Wright chooses to focus upon the image of Verlaine as an artist rather than Verlaine as a prisoner. This echoes her desire to portray the characters, rather than the criminalities, of these inmates.

> "suffering is one very long moment… time itself does not progress. It revolves. It seems to circle around one centre of pain".

Perhaps a better figure to represent these prisoners' abject conditions and the toll it takes on the human psyche is Oscar Wilde, who is also invoked by Wright. Unlike Verlaine who "had a relatively easy incarceration", Wilde was sentenced "to hard labour in reading jail" (Willsher). For Verlaine, his time of imprisonment served as a period for reflection, contemplation, and discovery of religious fervor. Upon release, he reached new literary acclaim for the poems he had written in prison. However, in the case of Wilde, his time in prison effectively destroyed his career, mental health, and faith in humanity. He was never able to publish anything of literary significance again. His friendships were no longer left intact, and he had lost custody of his children.

From his prison cell, Wilde wrote a letter, *De Profundis,* addressed to his lover. This letter eloquently conveys the pain and suffering of a trapped soul. Wilde writes that "suffering is one very long moment…time itself does not progress. It revolves. It seems to circle around one centre of pain". The infinite nature of time described here brings to mind Wright's earlier motto "to unequivocally lay out the real feel of hard time" (xiv). In prison, time does not seem to pass; it only stays still. Wilde's cynicism in *De Profundis* mirrors the disillusionment of the speaker mentioned earlier, who claims she is not Verlaine. Wilde writes that "outside, the day may be blue and gold, but the light that creeps down through…the small iron-barred window … is grey and niggard". The symbolic window resurfaces, but in a context akin to Wright's speaker than Verlaine's. There may be a beautiful sky outside

(*Le ciel est par dessus le toit*), but this beauty is inaccessible to those in prison. Only misery and misfortune fester in these cells.

Wright makes a single reference to Wilde in her poem "Modern Times". She writes, "Sebastian Melmoth, Wilde's pseudonym upon release/ but he was pretty much finished with literature by then/ Who felt chosen to teach/ the meaning of sorrow and its beauty/ that is, literature was pretty much finished with Wilde" (Wright 32). When you are imprisoned, your identity from the "free" world no longer pertains to you— you simply become a convict. Wilde had a prolific literary career before he entered prison, but once he stepped into the cold, relentless cell, his fame was rendered obsolete. As stated before, the experience of being imprisoned took a toll on his psyche, making his transition to normal life difficult. He was rejected from the field of literature, because people cared little about what he had to say in regards to his time in prison. Those who are free rarely stop to think about the cruelties of a system if its destructive aftermath does not affect them. Wilde reflects that, "if I realise what I have suffered, society should realise what it has inflicted on me… there should be no bitterness or hate on either side". He notes the hypocritical nature of Society, which is often quick to condemn and inflict punishment on individuals, but rarely recognizes its own flaws. The judicial system expects prisoners to repent for their own sins, but fails to make amendments.

Critic Martin Earl brings up an important point when he speaks of the "voyeuristic nature" of Wright's work. As someone who has never directly experienced imprisonment, Wright has to figure out how to do justice to her subjects' narratives. She is faced with a problem regarding "allyship", and in her introductory poem "Stripe for Stripe", she states "I already feel guilty./ I haven't done anything" (xv). Wright knows that she is in a predicament; more precisely, how can she write about these prisoners' lives without encroachment? Part of her solution is to allude to other prison poets such as Verlaine and Wilde. By referencing Wilde, who also worked to advocate for prison reform in his later years, Wright positions herself near him. She, too, uses her literary talent to advocate on behalf of those imprisoned. Michael Leong writes in his dissertation that "Wright effectively enacts the associative trope" when referencing artists who were historically part of


this genre of prison literature (152). These allusions establish Wright's credibility as an artist through association with these well-known literary figures, as well as build empathy with her subjects.

These allusions also serve to comment upon the role of language in prisons. To prisoners, language is their last defense in such a bleak place; letters are the last privilege granted to them. The stylistic mode of a letter plays a central part in Wright's work. In her heartbreaking poem "Dear Unbidden, Unbred", Wright tells the story of Mack, a prisoner who had a pet spider named Iris. She writes that "He loved Iris/ When Iris died/ He wrote her a letter" (Wright 39). Whether addressed to a family member or simply a loved one to be commemorated, letters become these prisoners' only outlet for expressing their feelings, thoughts, and emotions. The letter is also an innately private form, shared between two parties. This intensifies the intimacy and gravity of the stories chronicled in Wright's work. Critic Martin Earl says, "Language, after all, is the one thing that can't be taken away from them". While Earl's statement about the importance of this stylistic form is accurate, he fails to touch upon a bigger point, namely, the letter as an outdated form of communication. With the advent of technology, people of the "free world" are progressively turning away from the letter and towards e-mails and social media to communicate. The fact that prisoners can only rely upon this outdated mode of communication highlights the growing difference between this "alternative world of incarceration" (Earl) and the free world. The outdatedness of the letter parallels the backwardness of prisons. More specifically, Wright's use of the letter as a stylistic tool serves to depict prisons as institutions against progress. It chides our broken justice system in need of repair and reform; herein lies her political message.

From the onset, Wright clearly states her motivations for creating this book. In her introductory poem "Stripe for Stripe", she writes that when she first started to work on this project, she had "hoped to add one true and lonely word to the host of texts that bear upon incarceration" (ix). This suggests she wants to improve upon the existing genre of "prison literature" by effectively portraying the emotions – the despair, the hopelessness, the barenness - of prisons and prisoners. Wright's manifesto "to add one true and lonely word" to the "host of texts" also reflects her aim to humanize
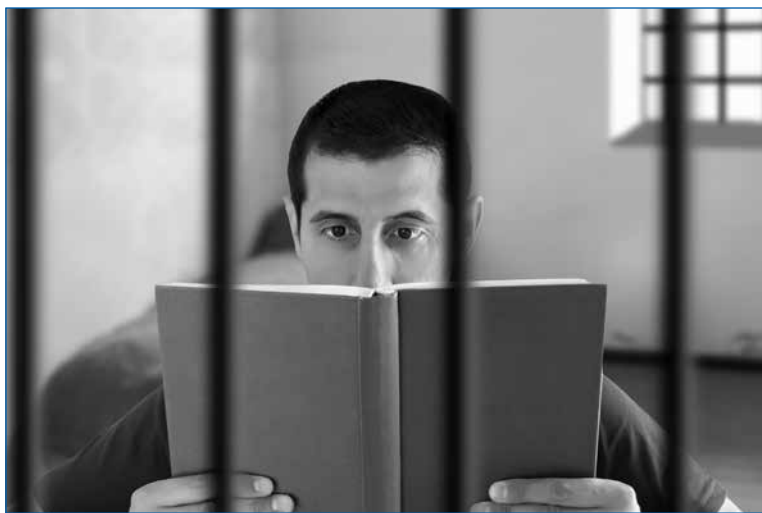
these prisoners to her audience; the unique "selves" of each prisoner should not be grouped together as a "host of texts". Wright wishes to communicate, as a reporter does, the perspectives of these inmates, and purposely uses the expression "word" instead of "story". The term "word" suggests that she will be including verbatim accounts, quotes from inmates themselves, whereas the term "story" has an air of fiction about it. A "story" can be sensationalized, exaggerated, or manipulated in a way that aims to entertain. Her work is not merely art *about* prisoners, but art that *encapsulates* the voices of these prisoners. A crucial distinction between Wright and other prison poets is that she uses poetry to communicate a political message, while other artists such as Verlaine and Wilde have used poetry for a more personal purpose (perhaps in part, due to the fact that their accounts are firsthand).

According to the critic Martin Earl, American poetry has traditionally been divided into two camps. Mainstream poetry, in the vein of Whitman and Williams, aims to emulate the speech of common folk; turning to Harlem and Brooklyn for inspiration, while the more grandiose poets such as Eliot bend tradition and deal with the metaphysical, inspired by luxury and splendor. With the advent of Modernist poetry, "the increasing fragmentation and difficulty of poetry required specialists to discern it, moving it into the college classroom" (Bain). This trend supports Earl's lamentation that poetry has, as of late, become an exclusive industry tailoring to the "intellectual elite". Poetry has become a business, a corporation managed by "a cabal of editors, panels of judges, senior poet-professors and an archipelago of coercion known as the MFA…" (Earl). The Master of Fine Arts (MFA) seems to patrol the boundaries of the poetic world; it serves to keep poets out and closes doors of opportunity for young poets who wish to be published. A study conducted on poetry readership in America found that "poetry readers in particular, tend to be women and adults with higher levels of education" (Bailey et al. 1), while researchers from the National Endowment for the Arts found that "literary readers are predominantly white women over the age of 24 with graduate-level educations" (Bailey et al. 5). Remarkably, Wright uses this high-art medium reserved for the aristocracy to channel the souls of the oppressed. Her work then becomes poetry for the masses, a sort of counterculture movement against the medium becoming highbrow and selective. Her work is also innovative because it defies categorization; it does not align itself with solely the Mainstream or Non-mainstream camp.

Wright is aware that "the popular perception is that art is apart" (xiv), but she begs to differ. There should not be a disconnect between art and the public because the two influence each other (a sort of shared consciousness that Rukeyser describes on page 51 in *The Life of Poetry*). Wright is fully cognizant of the view that poetry (and literature) is for a select group of the population. When she makes allusions to literary giants such as Verlaine and Wilde, she takes up the role of speaker; the distance she maintains elsewhere is gone. As Earl puts it, readers "never lose [the] sense that the ear of a master…is at work in the background". There is little possibility that these prisoners, who are victims of "the interrelation of poverty, illiteracy, substance and physical abuse" (Wright xiv), made these references themselves in their conversations with Wright. There is little possibility that they have even read

the works of Wilde and Verlaine, when "the average state prisoner has a 10th grade education" (Tsai & Scommegna). Therefore, an irony naturally exudes from this juxtaposition of literary allusions with crude, prison vernacular. Wright plays upon a tension between what is commonly referred to as high and low cultures to shift her readers' focus to privilege and injustice. To what degree does one's environment play a part in whether or not they end up committing a crime? Do poverty and illiteracy truly have an effect?

When readers become aware of this shift of narrative angle, from the prisoners to Wright, they are also made aware of their own position in the grand scheme of things. Entangled in issues such as poverty, race, and education, the divide between the general public and elite resemble the schism between the prison and free world. Drawing from the demographics of poetry readership, one can assume that the reader of this book is fortunate enough to be literate and free. The reader, recognizing the privilege they hold in comparison to those they read about, simultaneously feels guilt and sympathy. The pathos created by Wright in this way extends support to her political message- the two worlds are becoming too stratified; prison reform is much needed in our country. By highlighting the relationship between different factors such as addiction and illiteracy, and how they contribute to rising incarceration rates, she traces a path that leads to this cycle of despair. By hinting at this relationship, Wright offers possible solutions to a bigger problem, but in doing so, she raises and confronts her readers with more questions. Can art be a method of coping with trauma? Can art prevent and/ or heal those who are on the brink of rejecting their own reality?

Certainly for Verlaine, poetry served as a coping mechanism. Bernhard Frank writes in his journal article "The Generic Puzzle of Verlaine's Le Ciel Est, Par-Dessus Le Toit" that this poem differs from most of Verlaine's other works because details are omitted. Without the context of the speaker being imprisoned, the poem seems like an ode to a peaceful countryside, a lullaby. Frank claims that "the generic choices…offer an escape…soothes, even if it cannot

heal". Verlaine, by "impossibly idealiz[ing]" (Frank 95) what he no longer can experience, creates an illusion that makes his current situation bearable. Wright does the exact opposite of what Verlaine did with his poem. She includes specific details that the reader has no context for- only the prisoners themselves and Wright know the meaning of these words. For example, instead of the speaker hearing "a bell… tolling… a bird… calling" (Frank 94) the speaker of "My Dear Conflicted Reader" "count[s]… pills.. mosquito bites... storm candles.. stitches" (Wright 14). While Verlaine strives to mentally escape and forget his current situation, these prisoners painstakingly remember every detail about their surroundings because this is their reality now and forever. Their memories are all they have left, and so they keep on remembering even as time passes. They hold onto the thought of life as it once were. Indeed, as Wilde wrote in *De Profundis,* suffering has a way of making time "circle around one centre of pain".

Reading these catalogues of details, one is struck by the resilience of those who continue to live despite the dreary conditions they are put in. Wright manages to not only humanize her subjects, but also unorthodoxically portray them as survivors. This humanization is partly driven by the normalcy present in the everyday lives of these prisoners. Some prisoners even have jobs as coffin-builders and housekeepers in these complexes. As referenced earlier, in her poem "Dear Unbidden, Unbred", Wright introduces her readers to Mack, a man who had a pet spider. This part of the poem reveals his sensitive and caring nature in a way that other portraits of prisoners don't necessarily do. Mack is neither cold nor calculating. Wright does not "other" the prisoners by defaulting to the "insane criminal" stereotype. Instead, she reveals the similarities between prisoners and the "free" people.

Like several other devices in the work, however, this "normalcy" has a two-fold nature. It draws attention to the notion that prisons are islands so isolated from the main world that they have essentially[become self-serving institutions in which the prisoners have created a society for

themselves. There is almost something dystopian in the nature of this idea of the world of incarceration as a bizarre self-contained realm.

In one particularly striking scene, Wright describes an afternoon trip to the Transylvania prison. She writes: "It was a steaming day; the men were lifting weights and plaiting their hair" (xi). Wright remembers one man, with "large, direct aquamarine eyes" and a face that was "severely scarred". A guard tells her that his brother had put a tire on his head, then subsequently set it aflame.

"This I did not know how to absorb" (Wright xi).

Even on a seemingly normal day, prisons are places of dysfunction. This eerie marriage of mundane details about the weather and the image of domestic abuse and terrorism reinforces this idea. Wright's response is neither right nor wrong, appropriate nor inappropriate. It is an understandable response from someone who has not been subjected to a similar experience.

I have never been an inmate. I have significantly different stories to tell than these men and women do. I may never wholly *know* them, but *One Big Self* is the closest I can get for now. Wright's artistic endeavor has made it clear to me that hate breeds violence, and violence breeds hate. It warns against unfair condemnation of others— after all, who can truly say they are free of sin? We, as readers, may not always agree with the choices that these inmates have made. We may not even know how to react to their narratives. But empathy and compassion, delivered through careful and sincere listening, are the best tools we have for preserving our shared humanity. This is the first step towards healing.

"[Sorrow] is a wound that bleeds when
any hand but that of love touches it, and even
then must bleed again, though not in pain."
-Wilde

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Illness Narratives as Empathy Training Tools in Medical School

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Instructor:
Denise Comer

Spencer Flynn

I love stories, and I love medicine.

My Writing 101 class, Illness Narratives, reflects these dual passions. Taught by Professor Denise Comer, the class speaks to the humanity, the storytelling nature, which is interwoven into medicine and illness experiences. Through Professor Comer's class I was able to strengthen my writing and revising skills while synthesizing my passions for stories and medicine. I began to see how far stories penetrate into every bit of human life – and also how impactful the specific stories of human illness are on patients, practitioners, family, and friends.

As I delved further into this subject I became struck by peoples' need for compassion and understanding during their illnesses. I began to ask very direct questions about how we, within our highly developed medical systems and medical philosophy, address these needs: are our physicians prepared to address patients' emotional needs? If not, why not? Is an empathetic physician important to patient outcome and satisfaction? If so, how can our medical system learn to produce the ideal physician who is both biomedically competent *and* compassionate? Is it even possible to teach compassion and understanding?

Through all of this question-asking and research-exploring I discovered something exciting: that I was developing the skills to systematically address questions of substantial importance with original and potentially valuable responses. I learned how to slog through research papers, extract meaning, determine validity, explore my own biases and desires for easy answers, categorize possibilities, and admit the limits of current knowledge, and specifically my own knowledge. I learned that I can still develop much further, that in spite of that I can forward real knowledge into the world, and that there are so many people to support me in that journey of growth and knowledge-seeking.

This paper and its incorporation into Deliberations is its own little narrative, made possible by the contributions of many others. I want to thank Professor Comer for her support and her wonderful introduction into the fascinating world of illness narratives; Professor Emch, my editor, who was endlessly patient through rounds of revisions; and my friends and family, for tolerating my musings about illness narratives and empathetic patient care.

Abstract

In this paper the value of empathy in healthcare is explored and affirmed through a review of research. A further survey of research conducted into medical education systems reveals a trend towards diminishing empathy among medical students during medical school. The impending physician shortage and the subsequent need for cost-effective, highly efficient medical care may be a factor in this unfortunate pattern. This paper argues that medical schools should combat this troubling development by using illness narrative trainings to grow medical students' senses of empathy. Illness narrative techniques can be integrated in a relatively unobtrusive manner with existing medical curriculum, and without taking away from students' biomedical instruction. Guiding principles for and examples of this incorporation are offered.

Introduction

"Do I get a bonus if I act like I care?" sneers doctor House, from the show of the same name, in a sardonic response to patients and other doctors about their emotional needs (Attias, n.p.). House is famous (and popular) for his detachment, for his sarcastic, bitter, even pained and depressed attitude toward the world. While admittedly often entertaining and pithy, his character showcases what is all too often the case in modern medicine: a clinical, cold form of care that results in both doctors and patients feeling alone. But the history of western medicine was not always based in this detached philosophy, and the story of how western medicine arrived here is the story of a healthcare system that has itself become ill.

Circa 400 BCE Hippocrates, the founder of western medicine, set the new field's foundation on an ideal of compassionate patient care by affirming that "the patient, though conscious that his condition is perilous, may recover his health simply through his contentment with the goodness of the physician" (Halpern, 301). However, in 1904, the father of modern medicine, Sir William Osler, called for a break from this tradition by advocating for a physician ideal of "detached equanimity" (Halpern, 301). He believed this new focus would provide for maximally composed and efficient patient care (Halpern, 302)

Osler's recommendation, and the nearly contemporaneous World Wars, led to a new, almost militaristic, medical mindset, in which calm under pressure, efficiency, and biomedical skill were primary concerns. Medical school turned into a

boot camp of sorts, and military doctors were expected to move from badly injured patient to badly injured patient, only working on the task at hand. By necessity, they were given little time, and certainly little training, to focus on empathetic concerns or even their own emotional needs (Gutkind, 92). These military doctors brought this mindset back to the United States after the wars ended. By the 1950s and 1960s, this attitude, coupled with the triumph of biomedicine in providing for incredibly innovative medical care, led biomedical skill to be emphasized over compassion in healthcare. The white-coated, detached, utilitarian doctor became the ideal. Medical sociologists have dubbed this era of medicine the "modernist" period, in which biomedical knowledge took precedence over the ability to understand and emotionally care for patients (Frank, 5). Most agree that we still largely operate with this mindset today

It was not until the 1960s that backlash towards utilitarian bioethics atrocities of the preceding decades led to a revolution against this cold medical model. This backlash laid the groundwork for future ethicists who, in the 1990s, began a movement towards compassionate patient care (Halpern, 302). This ongoing movement can be called a "postmodern" medical shift, with medicine transitioning towards a balance of the old Hippocratic ideal of patient-centered understanding while maintaining modern requirements of biomedical competency (Frank, 6). Currently, the Association of American Medical Colleges (AAMC) and the majority of universities agree upon the importance of empathy in medical care and claim to be pushing towards a post-modernist, patient-centered model of care (AAMC, aamc.org).

Yet, the impending physician shortage (estimated at 40,000 primary care physicians by 2020) will put a strain on American healthcare's commitment to empathetic medicine (Bodenheimer et al., 1881). Already, the AAMC and hospitals at large are adopting new, efficiency focused programs that will maximize care provided, but which will provide little opportunity for empathetic patient care and decrease the length of patient-doctor interactions (Chen). Confronting the problem of empathy training in medical school would help future doctors navigate this increasingly efficiency based system while maintaining compassionate care.

Ideal medicine is empathetic in nature while maintaining the efficiency required to meet community needs. The question of how to realize this ideal is the crux of this paper: What are the best methods for integrating empathy training into our current medical environment?

Many others have delved into this same question and laid a foundation of knowledge for discussion (Brown et al.; Carson; Frank; Gutkind; Kumagai). Indeed, physicians and medical sociologists have been writing and discussing schemas for understanding and methods of improving compassionate care. One of the most influential concepts to come out of this literature has been the idea of the illness narrative. Functionally defined, illness narratives are the stories of illness and suffering that people use to process and find meaning in their illness experiences (Kleinman, 17-18). Doctors, theorists, and researchers widely praise illness narratives as effective means for increasing empathetic skills in physicians (Hyden, 50). Approaching the question of empathy in medicine from the perspective of illness narrative exercises will show how they can be incorporated into medical education in order to ameliorate the medical education process and, ultimately, create more effective and satisfied doctors.

Methods

Three categories of questions, which build on each other to reveal the current state as well as ideal future for empathetic medicine, were asked and researched: What impact can empathy have in medicine, for patients and/or for medical personnel? What is the current state of empathy training in medical schools and hospitals? What are the most effective and efficient methods for teaching empathy to medical students, and how do illness narratives factor into these methods? Key words used in these searches include *empathy, medical students, illness narratives, medical schools, medical school curriculum, mental health of medical students, mental health of physicians, medical curriculum reform,* and *modern medical environment.* Articles were limited to be peer-reviewed, in English, and not published prior to 2000. No specific databases were used. Articles were selected, analyzed, and synthesized into the three categories discussed below, which are based on the three categories of questions used in searching for articles. Relevant books on the topic of empathetic medicine were also surveyed. While there is an abundance of research on the importance of empathy in medicine, the current state of empathy training in medical schools, and the ability to train empathy through illness narratives, there is a lack of research on best illness narrative practices. Therefore, I based my recommendations off of available evidence and my own intuitions, but some claims warrant further research.

Value of Empathy in Healthcare

Both research and the personal experience of medical professionals provide strong evidence of the beneficial role empathy plays in optimizing healthcare. Indeed, doctors rate empathy as a highly important skill for a medical provider (Tsimtsiou, 146). This is for good reason, as high empathy in general practitioners correlates positively with patients' satisfaction with their medical experience, patient's overall health outcomes, and physician satisfaction and longevity (Bland, 5; Halpern, 308).

Many doctors and sociologists have commented on why these correlations exist (Moore, 20; Pennebaker, 5; Mercers et al., 6). Common explanations include that empathetic physicians' increased interest in their patients leads to less medical errors and empathetic physicians' better personal mental health allows them to provide superior care (Moore, 20). The most widely accepted theory argues that empathetic physicians better provide for patient's emotional and social needs (which have been shown to impact physical health) during a period of emotional distress caused by illness (Pennebaker, 5). Indeed, studies demonstrate that patients of more empathetic general practitioners feel more empowered and in control of their illness experiences (Mercers et al., 6).

Furthermore, high empathy is beneficial not just for patients, but also for medical personnel themselves. Research shows that doctors who score higher in empathy measurements are significantly less likely to suffer from depression, anxiety, or burnout, and more likely to express satisfaction with their job (Halpern, 308). Intuitively, this makes sense. Both patients and doctors go through emotional, even traumatic, experiences because of illness. Accordingly, both groups need modes of processing and understanding trauma within the framework of their lives. Empathetic environments meet the needs of physicians and patients as they process difficult, traumatic experiences.

Empathy in the Modern Medical Environment

The evidence discussed above clearly shows the benefits of empathy in the medical environment for practitioners and patients. But healthcare's recent focus on efficiency, particularly in face of the physician shortage, is a challenge to doctors

who strive to be empathetic caregivers. Giving physicians a head-start on this challenge early on through effective medical school empathy training is critical for reducing potential losses in empathy.

Yet, numerous studies find that instead of medical students developing empathy during their education, more time in medical school actually correlates with significantly lower empathy (Hojat et al., 934). A particularly significant drop in empathy occurs among medical students during their third year of medical school, the same year that medical students begin their clinical rotations (Eikeland et al., 165). A qualitative study of third year students found that students claimed the "hidden curriculum" – the informal behaviors, attitudes, and expectations of attending physicians/instructors – contributed most to student's diminished empathy (Hafferty, 403). Indeed, it has been shown that medical students learn largely from observing their attending physicians, many of whom are lacking in empathy (Hafferty, 403).

An example can help elucidate this point. Marion Bishop is a physician who published an essay recounting her experience dissecting her first cadaver (Gutland, 79). She described her feelings on the cadaver dissection process by saying that it is "trauma we are experiencing" (Gutland, 89). She continues to explain in great detail how torturous the process was, how dehumanizing and strange and sad to see a woman (she calls the cadaver "the woman") in such a condition and yet to be expected to appear scientifically detached from the situation. She recalls how "nowhere was the woman's humanity mentioned…her personhood was never mentioned" by the instructors (Gutland, 86). Instead, the instructors discussed the experience solely as scientists. Bishop then discusses how her classmates eventually "just plain checked out" (Gutland, 89) of the disturbing and troubling process of dissection. The students needed to discuss the ethical and humane implications of what they were doing and learning, to place their emotions within the context of a narrative and purpose. Instead, instructor attitudes worked to indoctrinate students into a state of emotional numbness. The hidden curriculum can be seen at work in Bishop's story, where instructors failed to encourage students to process their experiences but instead influenced them to become clinical and detached.

Intersecting with the problem of the hidden curriculum are five additional factors that likely contribute towards falling empathy levels during medical education: 1. the perceived requirement of emotional distance in maintaining professionalism (i.e. that it is presumptuous of medical professionals to ask emotional questions), 2. a need for emotional control during medical work, 3. the emphasis on biomedical knowledge in medical curriculum (perceiving humanistic knowledge as "soft"), 4. cognitive overload when trying to be both empathetic and biomedically adept (a belief that being empathetic will decrease a physician's ability to function and to create ideal medical plans), and 5. cynicism as a coping strategy, along with gradual habituation to pain and suffering (Eikeland et al., 165).

Other researchers point to fear of failure and making errors, the refusal of the medical system to admit errors, constant public embarrassment as well as fear of the same, and difficulties for medical students in reaching out about personal mental health problems as large contributors to decreased empathy largely because the students felt less happy and cared for themselves (Benbassat, 528). Indeed, students in one study often reported watching their attending physicians act in unethical ways and feeling powerless to stop them (Benbassat, 529). They also reported feeling uncomfortable discussing their own mental health problems, with about 35 percent of medical students experiencing depression during medical school (Benbassat, 531). Frighteningly, low empathy leads not just to worse illness in patients, but also higher instances of mental health illnesses in the doctors themselves (Benbassat, 528).

All of these beliefs and factors that cause diminishing empathy throughout medical school are either false or avoidable by changes in medical practice. For example, the ideas that empathetic physicians cannot cope with the stresses of medical practice, and that patients want their doctors to be detached and un-intrusive, have both been shown false in studies (Gleichgerrcht & Decety; Stone, 1294). Indeed, Decety found that medical student burnout occurs not from having emotion, but rather from not being able to manage emotions in a positive way and then becoming detached. This finding is further evidence of the need for empathetic training to teach doctors to manage their traumatic experiences and emotions. The remaining reasons listed for the empathy drain of medical school, such as students' fear of errors and focus on biomedicine, can be attributed to the hidden curriculum of the medical environment in which they work and train.

The problem of medical students' vanishing empathy can be seen poignantly through Bishop's experiences. She describes how physicians during her residency "advised that [she] need[s] to compartmentalize" and that "emotion is a luxury a good doctor cannot afford" (Gutland, 90). Statements such as these eventually forced Bishop to ask "if

I am required to put my humanity on hold…or if there are ways to get [to become a doctor] that leave my own body and soul intact" (Gutland, 92), and whether "a shutting down of the feeling part of myself that is the very reason I came to medical school in the first place" would be required of her (Gutland, 90).

Most doctors state a desire to help people as a primary reason they pursue medicine (Millan), and yet they are too frequently stripped of this sense of purpose by emotionally challenging medical experiences in conjunction with negative pressures from the hidden curriculum. It is wholly destructive, for both patients and practitioners, that young doctors must ask themselves if they have to give up their reason for pursuing medicine in order to practice it. Moreover, they should not have to confront this thought. Research reveals that doctors who can balance high levels of empathy with low levels of causally related anxiety tend to be the most satisfied with their careers, and the most effective medical practitioners (Gleichgerrcht & Decety). This ideal should be the goal. The calm and compassionate doctor paradigm is empirically better for the medical profession than the calm and cold doctor. But creating compassionate and calm doctors is currently difficult for medical schools, as evidenced by the steadily diminishing empathy trend throughout medical school. The medical establishment must be proactive in addressing this shortcoming by directing research, interest, and passion into creating more compassionate physicians.

Medical School Curriculum Recommendations: Incorporating Illness Narratives and Empathy

Bishop's traumatic experience with the cadaver ends with Bishop finding peace through the creation of a narrative. Bishop reflects that "I try to believe that what this woman and I are doing is greater than both of us: that someday there will be redemption for her desecrated body" (Gutland, 96). Once Bishop is given the time to process her experience, she manages to come to terms with it in an enriching way. Perhaps the deceased woman herself might have employed similar narrative methods and meaning-filled expressions to be able to stand up under her terminal diagnosis. She may have applied these methods even when agreeing to donate her body to the medical sciences.

There are two key goals of illness narrative training

for medical professionals: 1. to develop narrative skills to contextualize and find meaning in their frequently traumatic work and 2. to be faithful custodians of similar lessons to their patients. Ultimately, the hope is that illness narrative training will allow patients and physicians to maintain, and even grow, their empathy and emotional health throughout the illness process, instead of forcibly sacrificing it to their illnesses.

Excitingly, medical schools and practicing physicians have developed a number of initiatives in recent years that are effectively promoting empathy in medical students. Unsurprisingly, these initiatives largely rely on illness narrative training. One such initiative is the Family Centered Experience (FCE) at the University of Michigan, which seeks to promote the importance of empathy and patient-centered care. The FCE requires sustained home visits to volunteer families with a chronically ill member, discussions of academic theory, and reflection sessions, and has been shown both quantitatively and qualitatively to be effective in making medical students more empathetic medical practitioners (Kumagai, 657). During this program, medical students are encouraged to delve into the illness stories of their home families and to learn to adopt their patients' perspectives. In the words of the program director, Arno Kumagai, "the FCE engages the power of the stories that individuals and families tell of illness and medical care to open the perspectives of medical students to a more humanistic approach to medicine" (655). The success of the FCE in producing empathetic, psychosocially conscious doctors speaks to the success of illness narratives in improving medical practice.

Many elite universities have also begun to adopt curriculum reform in order to promote compassionate medicine. Harvard University's New Pathway Program includes yearly, longitudinal classes on doctor-patient interactions, psychosocial patient considerations, and reflective sessions. Its graduates self-report significantly greater confidence in their patient communication and psychosocial skills than non-program peers. Students have expressed similar enthusiasm to comparable programs at Duke University, the University of Arkansas, and Stanford University, and also demonstrated positive increases in empathy (Lam et al., 291).

Some grounding principles and practices should be kept in mind to promote illness narratives, including: 1.

finding passionate instructors who support the empathetic doctor ideal, 2. starting illness narrative training early, 3. teaching medical students to integrate their identities into their professional careers. 4. providing ample time for reflection following particularly traumatic experiences (e.g., first-time cadaver dissection and first-time interactions with high acuity patients), and 5. incorporating written and oral illness narrative activities within the framework of currently existing clinical learning. These practices can often be implemented without a major adjustment on the part of medical schools.

Passionate instructors form the foundation of the medical school experience, as they create the hidden curriculum through which much of medical students learning takes place. Perri Klass, a pediatrician and instructor at New York University medical school, wrote an essay on her role as an instructor who introduces first year students to the ins and outs of the patient interview process as a part of a course on "the patient narrative" (Gutkind, 40). She recounts facilitating an interview between four first year medical students and a man whose 2-year-old daughter had just been diagnosed with a rare bone disease (osteogenesis

imperfect). Specifically, Klass talks about how important it is that these students be exposed to the patient interview (and therefore patient narrative process) early on, while they are still "equipped simply with humility and humanity" instead of being bogged down by "professional filters" (Gutkind, 46). In doing so, medical students are immediately introduced, by example of a compassionate instructor, to the doctor-patient ideal and to a framework in which to understand and humanize their studies. Contrast this process to Eikeland's research on third year medical students' diminished empathy, which takes place in the context of unempathetic instructors and medical students whose first patient encounters occur three years into medical school. These students are awash with biomedical considerations and fears of failure. Accordingly, applying first year patient narrative experiences in medical schools could do a great deal to combat the third

year downhill trend in empathy.

The multidimensionality of medical stories must also be emphasized, particularly in relation to how medical students perceive their own roles. Klass argues that becoming a doctor "means becoming someone who can ask the questions, understand at least some of the answers, juggle all the stories, and in some way accommodate the emotion" (Gutkind, 49). Truly, this is a complicated job. When Klass discusses what she sees playing out in a routine patient encounter she identifies seven narratives, ranging from biological to developmental to familial. In order to deal with such complex information, doctors need to be able to pull from their own multiple identities, for example, as pediatricians and parents. This will allow physicians to realize the intersectionality and nuances of the various illness narratives playing out before them so as to render appropriate care, as well as understand the impossibility of perfectly comprehending and responding to these narratives. According to Klass, doctors must always "come back to the whole story, and the whole story is what pulls together all of your medical education" (Gutkind, 48). Essentially, doctors should be able to care for patients both as pathology experts and human beings.

Providing time for reflection would further bolster intersectional thinking, and, beyond that, allow students time to healthily process through initial traumatic medical experiences. Unfortunately, young medical students are not provided time to reflect or opportunities to learn healthy coping techniques. Bishop writes that the trauma of cadaver dissection left her with "nothing [to do] but wait to recover … to hold myself together until my soul had a chance to catch up" (81). Failing to provide outlets for young doctors like Bishop to process experiences deprives young medical students of the opportunity to learn empathetic skills that would last the duration of their careers. Such a failure is particularly striking within the context of a medical environment where 29% of students, significantly more than in most other scholastic programs, develop debilitating mental health and anxiety problems (Carson, 115).

Incorporating reflective practice does not necessarily require a major overhaul of curriculum. An easy way of incorporating time for reflection can be seen at the University of Missouri School of Medicine, which has attempted to directly integrate narrative medicine reflections into existing learning experiences (Brown et al., 324). The University of Missouri program initially involved medical students interacting with patients in order to gain clinical experience, but was recently adapted to include a short writing exercise. In this exercise students were encouraged to write for seven minutes from the perspective of their patient visiting a doctor for an appointment. The responses from the 193 students in the study were revealing: all but one student believed that the opportunity to write from the patient perspective was beneficial and should be applied to myriad medical

conditions (Brown et al., 324). This program is an example of how illness narrative curricula can be integrated into currently existing clinical training with minimal intrusion, providing the time and space needed for physicians to reflect so that they can develop a more empathetic understanding of their patients and themselves.

Conclusion

While the guidelines listed above are a good foundation for an initial push towards empathy training, more research into the question of how to maximize physician empathy while maintaining biomedical efficacy is needed. This question should be prioritized over more traditional research into the value of empathy for medicine and the current state of medical empathy, since there is already considerable data available on these topics.

Specifically, further research needs to be conducted on the most effective uses of illness narratives. For example, my specific claims and questions about ideal illness narrative integration should be examined in future studies. It would also be beneficial to investigate the long-term efficacy of illness narrative programs in promoting continued empathy throughout a physician's career. Studies should explore how

increased education to combat cynical misinformation - such as the widespread beliefs among doctors that it is necessary to be callous to survive in the medical system, and that empathy can distract from biomedical alertness - may encourage empathy among students. In addition, further research into hospital environment changes in accommodating the doctor shortage would be helpful in establishing a concept of how empathetic doctors may have to function in the rapidly changing medical system.

Ultimately, as patients face the fears and pains of illness, they want more than medical solutions. They want more than blood tests, sterile hospital rooms, and a medical experience that focuses only on their *disease.* They want to be cared for, not only by friends and family, but also by medical professionals who see them as *people* who have a disease. A commitment to the growth of empathy training, and illness narratives, in particular, is a commitment to just this sort of improved patient-doctor relationship, and therefore to improved healthcare. It is a commitment to more satisfied and emotionally healthy doctors, as well as to healthier, happier patients. It is also a commitment to a more humane world – a world of greater comfort for the sick and injured, and for those who serve them.

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Margo Orlen

Anyone who knows me well can tell you about my *thing* for science. Some kids dream about becoming astronauts or princesses; I dreamt about becoming a scientist. When I was tasked with selecting a Writing 101 course, I read the word "Neuroplasticity" and I was immediately hooked. It was in this course where I was taught the importance of asking questions, seeking answers, and expressing thoughts through scientific writing and research. So, why am I passionate about science? For me, science is simply a field of a vast unknown. And what an incredible task it is to explore the unknown.

This research paper provides some food for thought for the scientific mind, like my own, by delving deep into the realm of translational neuroscience. While the research proposal included in this paper is by all means hypothetical, I can tell you the topics, inquiry, and questions behind it are very much real. Why is it that we lose our memory capabilities as we age? Is there any means to prevent this from happening? It is the simple unanswered questions like these that provoke curious scientists like myself to investigate further. With the help of my incredible professor, Dr. Emily Parks, I was able to develop my skills as a scientific writer in order to formulate this research paper, which was an incredibly daunting, yet rewarding task my first semester at Duke. If anything, I hope it provides readers a bit of insight not only into the field of neuroscience but also into the workings of my scientific mind.

Vitamin Intervention:

Feeling Forgetful: Vitamin Intervention to Combat Age-Related Memory Decline

Margo Orlen
Writing 101:
Neuroplasticity:
Can we train the brain?
Instructor: Emily Parks

As humans, much of who we are as highly evolved, cognitively advanced organisms is defined by our complex ability to form memories. Memory dictates every facet of our daily lives necessary for work, school, running errands, and writing a paper. It is what we need from the grocery store, where we put our car keys, and how we drive to work. From a cognitive psychological perspective, memory is defined as the encoding, storage, and retrieval of information obtained from our experiences and surroundings (Baddeley, 1992). Research has shown that memory arises from a connecting neural network in differing areas of the brain including the hippocampus and prefrontal cortex (Baddeley, 1992). While memory serves as a driving force behind our cognitive abilities, effective memory functioning is not conserved over the lifespan.

Aging is an inevitable consequence of life characterized by an array of neuropsychological changes, including deficits in cognitive abilities, especially regarding memory functioning. By 2050, the United States Census Bureau estimates that the population of people 65 and older will reach approximately 84 million (Ortman, Velkoff, & Hogan, 2014), doubling the amount seen in 2012. With a growing aging population, there is a greater need for prevention and treatment of age-related memory decline. As a result, scientists in neuropsychology have become increasingly interested in investigating the underlying causes behind memory dysfunction over the lifespan. According to Salthouse (2009), evidence has shown that age-related memory decline may begin much earlier than once anticipated, displaying signs of impairment as soon as early adulthood in the 20s and 30s. This evidence highlights the importance of developing possible intervention treatments to slow or prevent memory decline.

Thus, researchers are currently exploring the question: can aging be "cured" through intervention strategies? While many strategies exist, one such strategy that I will be focusing on is vitamin intervention, specifically investigating which type of vitamin proves most effective for treating age-related memory decline, and at what point during the lifespan is best for starting vitamin intervention. In order to answer these questions, I first define age-related memory decline from both a biological and cognitive perspective. Once the basis for memory decline over the lifespan is established, I can then analyze vitamin intervention and effective timing strategies.

Defining Age-Related Memory Decline

Biological Changes

Many researchers have come to the consensus that age-related memory decline is related to changes in the hippocampus, a brain structure located in the medial temporal lobe responsible for memory formation (Myers, 2006). Damage to the hippocampus can result in impairment in memory functioning, as seen in the loss of memory recall and formation associated with Alzheimer's disease (Mu & Gage, 2011). As scientists have explored changes in the hippocampus structurally and biochemically, it has been hypothesized that progressive hippocampal deterioration contributes to memory decline over the lifespan (Foster, 1999). Although the complexity of the brain has made identifying age-related changes in neural pathways a difficult conquest for researchers today, scientists have plunged headfirst into exploring the mysteries behind hippocampal deterioration and memory dysfunction over the lifespan, specifically through the investigation of one paradigm called synaptic plasticity.

According to a literature review by Foster (1999), many researchers hypothesize that age-related memory deficits are related to adverse changes in hippocampal synaptic plasticity, a form of hippocampal deterioration. Hippocampal synaptic plasticity can be defined as the ability of synapses to increase or decrease in signal strength depending on activity, or lack of, in neural pathways (Byrne, 1997). In the field of neuroscience, one of the most widely studied forms of hippocampal synaptic plasticity is long-term potentiation (LTP) (Bliss & Collingridge, 1993; Cunha, Brambilla, & Thomas, 2010; Foster, 1999; Larkman & Jack, 1995). LTP can be defined as an increase in synaptic signaling following signal transmission between neurons (Shors & Matzel, 1997). Furthermore, the strengthening of connections between neurons demonstrated by LTP serves as the basis for the formation of memories (Hellemans, Decher, Smith, Gilmore, & Holahan 2013). Because LTP plays a crucial role in memory functioning, alterations to neural pathways involved in LTP have been linked to memory deficits, including those associated with aging (Foster, 1999).

When neural pathways involved in LTP are altered, the LTP process can be impaired, thus impeding the formation of memories. One hypothesis that attempts to explain the underlying mechanisms behind LTP impairment is regarding LTP induction. LTP induction can be defined as the compilation of mechanisms involved in initiating an LTP response (Shors & Matzel, 1997). Although it has been concluded that no induction deficits occur as a result of aging (Landfield & Lynch, 1977), research has shown that the threshold of stimulation at the synapse necessary for LTP induction changes as we age (Barnes, 2003). Thus, this change in threshold can hinder the ability to form memories. Although other hypotheses besides LTP induction changes exist, one common factor behind these hypotheses is that decreased efficiency of hippocampal LTP over the lifespan due to age-related changes can be connected to the observed loss in memory functioning.

Given the importance of LTP efficiency for memory, many molecules involved in LTP have been investigated for their roles in synaptic plasticity. Among

the many molecules involved in LTP, growth factors have been found to play an important part in synaptic plasticity and memory formation. Neutrophins are types of growth factors that promote the development, differentiation, and preservation of synaptic signaling and general brain functioning (Thoenen, 1995; Lewin & Barde, 1996). Specifically, recent studies have focused on the involvement of brain-derived neutrophic factor (BDNF) as an important player in LTP induction and synaptic plasticity in the hippocampus (Cunha et al., 2010). BDNF is a growth factor involved in the generation of new neural synapses, a key component of synaptic plasticity (Tapia-Arancibia, Aliaga, Silhol, & Arancibia, 2008). Furthermore, studies have shown that BDNF levels decrease with age (Tapia-Arancibia et al., 2008), causing impairments in LTP. Thus, as lower levels of BDNF cause decreased neural synapse strengthening, memory formation becomes impaired. Because BDNF plays a crucial role in LTP and, consequently, memory functioning, analyzing levels of BDNF in the hippocampus is a necessary factor to consider when studying age-related memory decline.

Cognitive Changes

Although alterations to neural pathways are evident from a biological aging perspective (as seen in previous discussion on LTP and BDNF), it remains unclear what age-related memory decline looks like from a behavioral perspective. In both rats and humans, aging has been correlated to impairment in spatial memory tasks. To measure cognitive changes in rats, scientists have used the Morris Water Maze (MWM), a procedure in which rats learn to locate a platform submerged in murky water in order to measure hippocampal-dependent memory functioning (Morris, 1984). Research by Gallagher, Burwell, and Burchinal (1993) shows that aged rats experience greater difficulty in recalling the location of the platform as a result of impaired memory functioning. Furthermore, a human

analog test similar to the MWM showed that when humans were exposed to a similar spatial memory task, older adults encountered greater impairment compared to young adults (Newman & Kaszniak, 2000). Thus, it can be concluded that as both humans and rats age, we see a decrease in cognitive abilities, specifically in spatial memory functioning, showing that memory decline has a cognitive component in addition to biological.

In summary, age-related memory decline manifests biologically and cognitively. From a biological perspective we observe that biochemical changes as a result of aging cause deficiencies in synaptic plasticity, and in turn, memory formation. A cognitive investigation shows impairment in spatial memory performance. Combining biological and cognitive components presents a clear image of the overarching definition of age-related memory decline as dysfunction in one has consequences on the other. Moreover, a deficiency in a neural pathway presents as impairment in cognitive functioning. For example, if a person shows decreased performance on a memory recall test, this could be due to dysfunction in neural signaling or impaired LTP. Although biological and cognitive decline comes as a natural consequence of aging, scientists are attempting to slow or even halt this process. This then brings about the question: if we try to intervene at some point in the lifespan, can intervention strategies slow or prevent age-related memory decline both biologically and cognitively? The proposed study works to answer this important question by investigating vitamins as a possible intervention strategy for conserving memory over the lifespan.

Intervention Strategies and Timing

Based on the hypothesis regarding synaptic plasticity, it can be inferred that successful cognitive aging is connected to the preservation of the functioning of LTP in the hippocampus. Thus, it follows to explore how one can promote healthy brain aging by preserving hippocampal functioning through intervention strategies. For example, past studies have examined exercise as a factor of improving hippocampal memory functioning (Erikson et al., 2011). While physical exercise has shown to improve memory, mental exercise has also proved beneficial as seen in the "use it or lose it" hypothesis, which states keeping the brain active through stimulating mental activities can potentially prevent or slow age-related memory loss (Salthouse, 2006). In addition to mental training, another such intervention strategy showing positive results in improving memory is the use of vitamins.

Several vitamins that have shown positive results have been examined for their involvement in improving or slowing age-related memory dysfunction. For example, in one such study, Latimer et al. (2014) analyzed the role

of vitamin D, specifically VitD3, in maintaining cognitive function throughout the lifespan. Rats were given low to high ranges of VitD3 every day. After 6 months, the rats on the high VitD3 diet exhibited greater performance in the Morris Water Maze, a key test of memory capability, and exhibited greater synaptic plasticity in neural pathways in the hippocampus. Therefore, it could be concluded that high vitamin D levels reduce memory deficits in middle-aged rats (Latimer et al., 2014). Furthermore, studies have also connected vitamin and supplement intervention to increasing levels of BDNF. For example, researchers found that providing mothers with both vitamin B12 and omega-3 fatty acids resulted in higher levels of BDNF in the brain, especially in the hippocampus, of the offspring (Rathod, Khaire, Kemse, Kale, & Joshi, 2014). This increase in BDNF levels signifies increased efficiency in LTP and, thus, improvement in memory. As research has progressed over time, scientists are finding more and more evidence connecting vitamin intervention to combating memory decline and improving synaptic plasticity as we age.

Although vitamin intervention has proven a promising intervention tool, we have yet to answer at what point in the lifespan taking vitamins proves most effective for preventing memory decline. Should people start taking vitamins sooner rather than later? Would any difference be seen between someone who starts taking vitamins at 5 years old versus 25 years old? Scientists have implemented vitamin treatments at various points in the lifespan, such as during mid-life. For example, Latimer et al. (2014) specifically chose to analyze the mid-life period when giving rats vitamin D because it is "an important window of time" as they hypothesized cognitive deficits arise during this part of the lifespan. Another variation of timing can be seen in a study conducted by Rathod et al. (2014) in which supplements were provided to pregnant rats and effects in memory were observed in the offspring. The discrepancy in timing intervention strategies, specifically vitamin intervention, must be addressed through further research. Thus, the following research proposal would prove to be an effective means to investigate in vivo the effects of vitamin intervention at differing age points. The results of this study would have implications for developing optimal treatment strategies to combat age-related memory decline.

Research Proposal

As stated previously, the expanding aging population has led researchers to elucidate the complexities behind memory loss to both develop treatments for existing memory deficiencies, as well as develop preventative strategies for slowing the onset of memory decline. Because evidence has shown the increasing benefits of using vitamins for this purpose, it would be worthwhile to further investigate the effectiveness of new vitamin treatment plans to prevent age-related memory decline.

Where past research is lacking is in addressing the optimal timing and type of vitamin treatment to be used. For example, Rathod and colleagues (2014) have shown promise in treating memory deficits when giving vitamins prenatally, yet it remains unclear whether this time point is the most effective for other vitamin types or if vitamin treatment following birth is equally effective. Additionally, no previous study has been conducted that readily compares differing vitamins given at various age points throughout the lifespan. Thus, this study would work to optimize both variables of time and type of vitamin treatment in order to develop the most effective intervention strategy for preventing or slowing age-related memory decline. What follows is a detailed proposal for an experiment that aims to develop an optimal vitamin plan by addressing the following research question:

How does the timing of vitamin or supplement intervention affect the preservation of hippocampal memory ability in aging rats?

To address this question, I will utilize Fischer 344 rats, effective models of age-related memory decline (Guidi, Kumar, Rani, & Foster, 2014), as the shorter lifespan of rats proves a feasible alternative to directly studying humans. Also, rats are more cost-effective and eliminate several ethical dilemmas. Furthermore, I will vary the timing of vitamin implementation at pre-birth, youth, or mid-life. Additionally, rats will either receive no vitamins, vitamin D, or vitamin B-12 plus omega-3 fatty acid. Throughout their lifespan, I will have the rats perform the Morris Water Maze task, a spatial memory tasks for measuring hippocampal memory. Furthermore, I will measure levels of BDNF in the hippocampi of rats post-treatment. Using Salthouse's (2009) hypothesis as a basis, which states cognitive decline occurs in early adulthood, I hypothesize that if vitamin intervention is implemented at youth then rats will preserve the most memory functioning over the lifespan showing better performance on the MWM and higher BDNF levels. Furthermore, the use of vitamin B-12 plus omega-3 fatty acid will prove the most effective vitamin treatment. The answers from this study, and specifically the discovery of the optimal vitamin treatment plan, may change the proactivity of humans in taking vitamins and prove crucial for slowing or even preventing age-related memory loss.

Methods

In this experiment, I will be examining hippocampal dependent memory and BDNF levels after implementing vitamin interventions throughout different points of the lifespan in rats.

Animals

Two-month old Fischer 344 rats will be used to model age-related memory decline and will be housed under standard conditions (22 degrees Celsius and 12 hour light and dark cycle). Breeding will commence when the rats reach 12 weeks and all rats will be of the same genotype. I will be manipulating two factors in my study. The first factor is time of intervention and the second is the type of vitamin used. I will use the following groups: (1) begins supplementation of vitamins "at birth" (after weaned from mother at 3 weeks), (2) begins supplementation "at youth" (3 months), and (3) begins supplementation "mid-life" (at 12 months). 20 rats will be assigned to each "timing" group. Within each intervention group, 10 rats will receive vitamin D supplements and 10 rats will receive a vitamin B-12/omega-3 combination supplement. Furthermore, as a control group, 10 rats will age with no supplementation. At 20 months of age, supplementation will cease and rats will be sacrificed. See Table 1 *"Experimental Groups"* for summary of vitamin timing that will be used.

Diet

All animals will receive the same necessary dietary components including the same levels of protein, fat, minerals, and normal essential vitamins. For the rats in the experimental groups, vitamin supplements will be added to their food bowls. Rats assigned to a vitamin D group will receive Bronson Vitamin D supplements at 10,000 IU at 3 weeks, 3 months, or 12 months. Rats assigned to a vitamin B-12/omega-3 group will receive 0.050 g/kg of vitamin B-12 as well as a Nature Made, Mini Fish Oil, Omega-3 supplement at 360 mg. Rats assigned to the control groups will continue with the normal diet. All experimental animals will receive their respective supplements every day once intervention has commenced. See Table 1 *"Experimental groups"* for summary of vitamin types that will be used.

	No intervention (control)	Intervention 1: At Birth (3 weeks)		Intervention 2: At Youth (3 months)		Intervention 3: Mid-Life (12 months)	
Supplement: Vitamin D (indicated by "D") or B-12/omega-3 (indicated by "B")	Control group: 10 rats	Group 1D: 10 rats	Group 1B: 10 rats	Group 2D: 10 rats	Group 2B: 10 rats	Group 3D: 10 rats	Group 3B: 10 rats
Totals:	10 rats	20 rats		20 rats		20 rats	

Table 1. *Experimental Groups.*
Both timing of intervention and type of vitamin shown.

Procedures and Measurements

Every 2 months, beginning at 2 months of age, the rats (including control rats not receiving vitamins) will be subjected to the Morris Water Maze (MWM) test to measure hippocampal dependent memory. See Figure 1. Rats will learn to find a submerged platform in murky water over 3 days. On day 4, the platform will be moved and the rats will be trained to remember the new location over an additional 3 days. The maze can be designed for the rats to seek the platform in one of the two scenarios: (1) the platform changing each day of training to measure episodic spatial memory and (2) the platform remaining the same to measure reference memory. Because research has shown that aged rats could still utilize spatial reference memory (Guidi et al., 2014), I will change the location of the

platform to target episodic spatial memory. The amount of time the rats take to find the platform will be measured.

At 20 months of age, rats will be sacrificed and their hippocampi will be collected. I will measure brain-derived neurotrophic factor (BDNF) levels in the hippocampi using ELISA, a method used to analyze protein levels (Cunha et al., 2010), expressed as pg/mg per tissue. See Figure 2 for an overview of the procedures.

Discussion

In summary, the proposed study focuses on forming an intervention strategy through the use of vitamins in order to prevent or slow memory dysfunction associated with cognitive aging. While previous research has shown positive results for using vitamins to slow cognitive decline and age-related memory loss, it is unclear at what point during the lifespan vitamin intervention proves most effective (Latimer et al., 2014; Rathod et al., 2014; Salthouse, 2009). Therefore, this study will aim to investigate (1) at what point during the lifespan vitamin invention is most effective in preventing age-related memory decline and (2) what vitamin supplementation proves more effective in prevention, vitamin D or a vitamin B-12/omega-3 combination supplement. After separately determining the most effective timing as well as the type of vitamin from the data, I expect that using the two in conjunction would form the most effective treatment plan. For example, if as individual factors 3 months of age (youth) is the best time point for intervention and the vitamin B-12 plus omega 3 works better than vitamin D, I expect that using a vitamin intervention implemented at 3 months (youth) with vitamin B-12 plus omega 3 will prove to be the *optimal* treatment plan for preventing memory loss over the lifespan.

The results from this experiment will provide insight into forming a complete "battle plan" for combating age-related memory decline. Firstly, people may seek to start cognitive intervention significantly earlier in the life than anticipated. Currently, the widely held notion of memory loss as sign of old age prevents people from acknowledging a need for prevention beginning
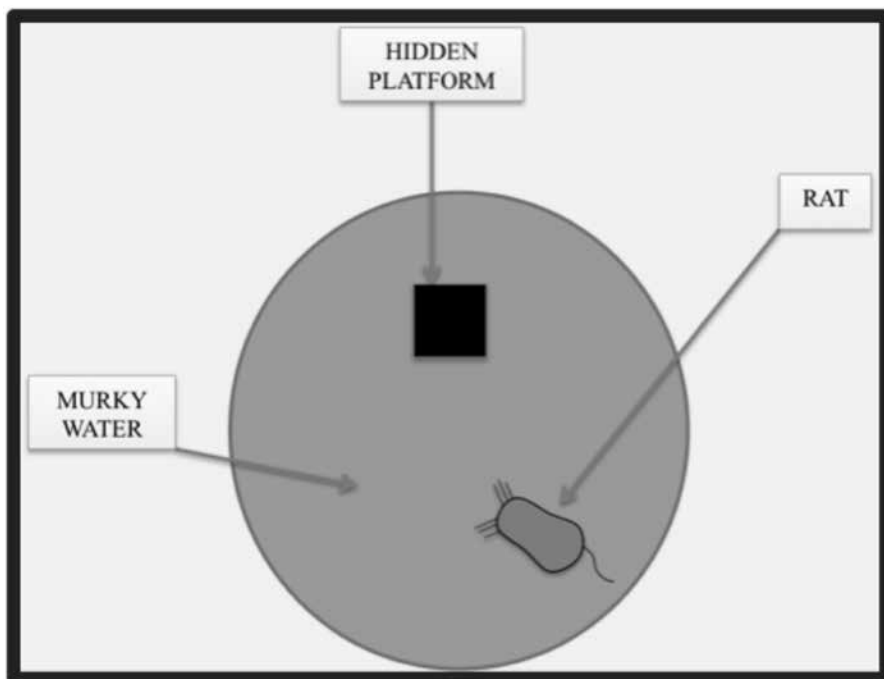

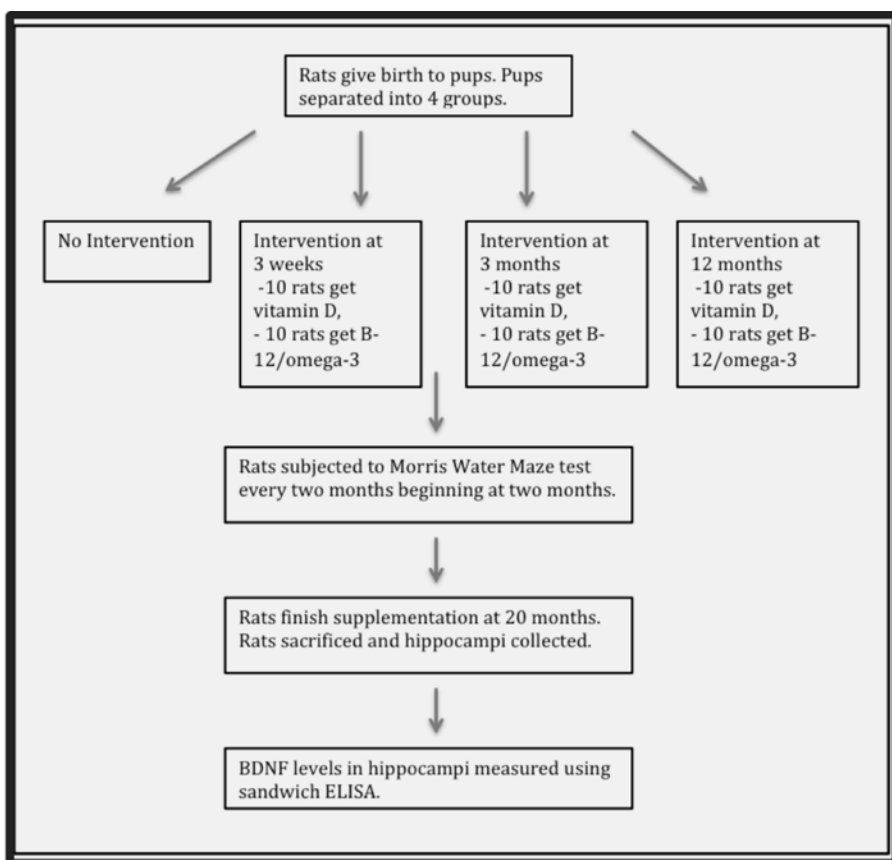Figure 1. Diagram of the Morris Water Maze in which rat seeks out platform to test memory.

Figure 2. Overview of experimental design.

at age 30 as opposed to 60 (Salthouse, 2009). Secondly, people may consider taking more vitamin and mineral supplements as new data emerges on potential health benefits. According to the 2003 to 2006 National Health and Nutrition Examination Survey, 39% of adults above the age of 18 take a multivitamin or mineral supplement with a stark increase in rates as age

increases (Bailey et al., 2011). If this study confirms my hypotheses, there may be an increase in prevalence not only in general but also among younger age cohorts. Finally, this study emphasizes the importance of maintaining brain plasticity in order to preserve memory. While this study focuses specifically on vitamin intervention, people may seek to preserve plasticity through other strategies in conjunction with vitamins, such as exercise, brain training games, and other cognitive tasks. All factors considered, this study will help people to form a holistic battle plan to prevent age-related memory dysfunction.

While this study will provide great insight into vitamin intervention strategies, future work is needed to expand on the prevention of age-related memory decline.

For example, the proposed study focuses on using a rat model of cognitive aging for practicality purposes. Thus, a longitudinal study should be conducted in humans to fully evaluate the effects of vitamin intervention. Future research should also analyze the holistic battle plan described above. This may include using vitamin supplementation in conjunction with exercise and even brain training games. Perhaps there is precedence for creating a therapeutic drug with components of vitamins such as vitamin D or B-12. As knowledge on cognitive decline and prevention is expanded through this study and future research, it will be possible to better identify distinct strategies and optimal treatment plans for combatting age-related memory decline.

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Anthropogenic Arsenic:

A Citizen-Science Based Case Study of Mining, Arsenic Distribution, and Water

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Abstract

Mining is the largest, anthropogenic source of arsenic contamination in water worldwide, with a breadth of life-threatening illnesses documented from consuming these waters. Researchers have extensively studied the mechanisms underlying arsenic dispersion, focusing specifically on distribution patterns and dispersion pathways used to predict areas of high contamination in soil. Both location-dependent and season-dependent factors influencing the spread of arsenic have been identified, providing support for studying mining sites on an individual basis. In this study, we propose a citizen-science based case study to identify the geographical distribution of arsenic contamination in surface waters surrounding the Iron King Mine in Southern Arizona. Whereas soil-soluble arsenic has been thoroughly studied, water-soluble arsenic patterns remain relatively undocumented, requiring research in various climates to positively identify universal mechanisms. In our study, we will specifically confirm or reject proximity-dependent patterns for arsenic distribution, as first studied by Razo et al. (2004), and use previous weather data to identify pathways and factors involved in dispersion. In addition, we will produce straightforward contour maps relating location to arsenic concentration near the Iron King Mine, allowing local residents and participating citizen scientists to adjust their behavior to avoid personal exposure to contaminated waters.

Introduction:

With unparalleled toxicity, arsenic endangers millions of people worldwide, causing serious health complications by its unintentional consumption. In the past, research has focused heavily on the effects of chronic arsenic poisoning (arsenicosis), revealing a breadth of risks ranging from mild nausea and vomiting to lethal heart failure and cancers (WHO, 2010). Trace levels of arsenic are also potentially harmful, as the metal maintains high toxicity even in small doses. For example, at levels considered acceptable by the World Health Organization (WHO), exposure to arsenic is three-hundred times more likely to cause cancer than other known carcinogens (Moore et al., 2002). Because of these dangers, identifying the mechanisms guiding arsenic distribution is essential not only to reduce ecological contamination, but also to minimize human exposure.

Although arsenic hot-spots often occur naturally in the environment (Naujokas et al., 2013), industrial processes such as mining greatly exacerbate

With a plethora of topics to choose from, we found similar reasoning in selecting *Citizen Science* as our class for the semester. For us both, citizen science was an unfamiliar and foreign topic, one that captured our interest for its specialized use in ecological research. Over the semester, we developed a holistic understanding of the standard procedures involved in writing a research proposal, while also learning about the strengths of citizen scientists in research. By the end of the semester, we were asked to write a full length research proposal for our final paper, leaving us both excited yet intimidated. With excellent guidance from Professor Julie Tuttle, we took our broad interest in studying water quality and narrowed our research focus to arsenic contamination. Through our extensive research, we became considerably familiar with current literature regarding arsenic contamination, and were also able to clearly identify the different scopes of scientific writing and research, from local to potentially global implications. We both agree, however, that what we found most exciting about our project, was the amount of support and help we received from Professor Tuttle and our classmates. We feel that this experience echoes the idea that research is not individual; it furthers society as a whole.

arsenic contamination, releasing pollutants into the air by dislodging heavy metal deposits from bedrocks and sediments (Lee et al., 2005). From analyzing mining sites worldwide, researchers have collectively identified proximity-dependent distribution patterns specifically for soil-soluble arsenic, showing higher concentrations of arsenic in ground samples closer to mining sites (EA Engineering, Science, and Technology, Inc., 2010). On the other hand, global patterns have yet to be established with regards to water-soluble arsenic, as research has been confined to the Villa de la Paz-Matehuala mining site in Mexico. Here, researchers have similarly identified proximity as the major predictor of arsenic contamination, specifying wind and heavy rainfall as the major pathways for dispersion (Razo et al., 2004). Nevertheless, because studies regarding water-soluble arsenic are limited to a single location, additional research is needed to definitively confirm proximity-dependent patterns globally and identify other weather-based pathways for arsenic distribution.

Research regarding the distribution of water-soluble arsenic around mining sites is limited because definitive global patterns have not yet been found. Citizen science projects provide a powerful basis for this type of research, employing large groups of volunteers, known as citizen scientists, in an economical and efficient approach to large-scale data collection (Ely, 2008). Historically, citizen scientists have served as an indispensable resource in ecological research, including studies regarding arsenic contamination and water quality monitoring. For example, research shows that citizen scientists collect reliable water quality data when trained by professionals (Fore et al., 2001) and greatly reduce project costs through the use of economical do-it-yourself (DIY) analysis kits (Yang et al., 2014). In addition, analysis of soil-soluble arsenic distribution over a large geographic scale has also utilized citizen science effectively, where volunteers sent in samples for analysis

by researchers (Ramirez-Andreotta et al., 2012). Thus, we propose a collaborative, citizen-science based approach to analyze the geographical distribution of water-soluble arsenic in communities surrounding the Iron King Mine in Southern Arizona. In the Southwest United States, naturally occurring concentrations of arsenic in groundwater are significantly elevated, highlighting distribution patterns and making exposure especially concerning to local residents (Welch et al., 2000). In our case study, we will confirm or reject proximity-dependent arsenic distribution patterns in water, and identify the specific weather-dependent pathways guiding dispersion at the Iron King Mine.

Literature Review

Arsenic and its Health Effects

According to the Agency for Toxic Substances and Disease Registry (ATSDR), arsenic is the highest priority hazardous substance to humans in terms of toxicity and frequency of exposure (ATSDR, 2016). A naturally-occurring heavy metal, arsenic is found in large quantities dissolved in groundwater, a frequent source of potable water (Hunt et al., 2014). Around the world, dependence on groundwater makes contamination especially concerning, as consumption and exposure to arsenic cannot be avoided (Chakraborti et al., 2015). In particular, estimates predict that nearly 200 million people are affected by chronic arsenic poisoning worldwide, showing the importance of medical research on the treatments and effects of arsenicosis.

The WHO (2001) separates the effects of arsenic into two categories: acute effects and long-term exposure effects. Acute arsenic poisoning results from short-term exposure and causes relatively mild health issues, such as nausea, vomiting, and abdominal pain. Long-term exposure to arsenic, however, is much more serious, resulting in a breadth of complications attacking almost every organ system in humans. For example, research has documented cancers in skin (Yu et al., 2006), lung (Heck et al., 2009), liver (Liu, 2008), kidney (Yuan et al., 2010), and bladder (Gibb et al., 2011) systems due to consumption of contaminated water. In the endocrine and cardiovascular systems, arsenic is known to cause diabetes (Jovanovic et al., 2013) and heart disease (Chen et al., 2011), while in the nervous system, complications range from reduced mental functions (Hamadani et al., 2011) to reduced motor abilities (Gong et al., 2011). Thus, the effects of arsenic are not only highly dangerous, but also extensively varied, making minimization of arsenic exposure critical to human health.

Arsenic Distribution and Mining

The dispersion of naturally-occurring and anthropogenic arsenic has been thoroughly researched, with many factors driving the spread of arsenic identified. One man-made factor strongly connected to arsenic pollution is mining, which dislodges high concentrations of arsenic from bedrock into the environment (Wang & Mulligan, 2006; Lee et al., 2005). For example, Lee et al. (2005) identify mining as a primary source of arsenic, using soils surrounding the Songcheon gold-silver mine in Korea to confirm the extent of anthropogenic contamination. Wang and Mulligan (2006) discovered similar findings in Canada, showing elevated levels of arsenic in soil, water, and air in the vicinity of gold-mining operations. Because mining frequently causes such extensive contamination, understanding the resulting distribution patterns is essential to reducing additional spread and human exposure in the future.

In regards to soil-soluble arsenic, researchers have not only classified the major pathways allowing for dispersion, but have also confirmed universal distribution patterns which result from these pathways. Specifically, wind acts as the primary avenue for dispersing air-borne arsenic particles, as ground soil downwind of mining sites often collect high concentrations of arsenic (Belluck et al., 2003). Globally, proximity-dependent distribution patterns result directly from this pathway, as soils far away from arsenic sources avoid wind-contamination by the added travel distance. For example, one case study at the Iron King Mine in Southern Arizona confirms an inverse relationship between arsenic contamination and distance from mining sites, describing air particulate migration – distribution of particles via wind transport – as the key mechanism driving dispersion (EA Engineering, Science, & Technology, Inc., 2010).

Occasionally, the pathways for arsenic dispersion depend on location and season specific factors (Wang & Mulligan, 2006), meaning that researchers cannot immediately generalize dispersion pathways and patterns to other mining sites. For example, whereas EA Engineering, Science, and Technology Inc. (2010) found proximity based patterns for soil-soluble arsenic at the Iron King Mine, Ramirez-Androetta et al. (2012) found instead randomized, scattered concentrations at this location, explaining that seasonal changes in wind patterns may have led to different results. Furthermore, undocumented sources of arsenic, whether naturally-occurring or anthropogenic, often distort and randomize distribution patterns in soil, making dispersion pathways easily misinterpreted or entirely unrecognizable (Wang & Mulligan, 2006; Ramirez-Androetta et al., 2012). Therefore, the identification of universal dispersion pathways requires experimental data at a variety of locations to fully account for location-specific factors.

Research on the spatial distribution of mining-dislodged arsenic in water, rather than soil, is limited. Although global patterns of soil-soluble arsenic have been discovered, researchers have yet to identify universal patterns of water-soluble arsenic due to a lack of global research. Nevertheless, in one study, Razo et al. (2004) adopt a case study approach around the Villa de la Paz-Matehuala mining site in Mexico to identify local distribution patterns in water. The researchers sampled arsenic concentrations in ponds and channels adjacent to the mining sites and discovered elevated levels of arsenic with proximity to mining. Here, the researchers also identified weather-based dispersion pathways, particularly heavy rainfall and wind, which deliver arsenic away from the mining sites to other local bodies. Regardless, because of the case study approach, additional research is needed to confirm whether these proximity-based distribution patterns and weather-based pathways are universal or location-specific.

## Water Monitoring and Arsenic in Citizen Science

The use of volunteer citizen scientists is well-documented in water monitoring projects (Conrad & Hilchey, 2010). Community-based models are particularly effective in water-monitoring initiatives, employing small groups of local citizens in custom-built projects to collect data on their waterways. These participants are self-motivated and engaged in the entire process, for they are affected directly by the initial problems under study and the resulting discoveries of the research (Ely, 2008).

Concerns regarding the validity of citizen-science produced data have been specifically addressed in the context of monitoring water and its contents. For example, Fore et al. (2001) show that the quality of volunteer collected data in streams is comparable to the quality of professionally collected data. Brewin et al. (2015) expand on these findings, showing that citizen-science data is also

reliable when collecting water-quality data on a large, geographical scale. Here, researchers employed surfers with temperature sensors and global positioning devices to measure sea-surface temperature in different regions of the coast. Results show that the surfers produced accurate, high-quality data compared to reports from a local oceanographic station, and that citizen-scientists can serve feasibly as a source of accurate, large-scale data collection.

Economic benefits of citizen science projects are also well researched. Brewin et al. (2015) note the economic advantages of collecting data with surfers, indicating that low-cost temperature sensors allow for widespread data collection. Other DIY kits have also been shown to have high accuracy and considerable economic benefits. For example, Yang et al. (2004) show that DIY LED-photometers can reduce costs of field data collection in water pH by a factor of one hundred or more. The researchers assert that these kits are particularly effective for citizen-science projects, for they are low-cost without sacrificing accuracy. DIY kits used to identify arsenic concentration have been studied extensively and verified as effective. For example, the Quick Arsenic and Hach EZ kits are effective for general use and show significant agreement with standard laboratory procedures in determining arsenic concentrations. Researchers assert that these kits are well-suited for public arsenic monitoring projects, for they can be used as accurate, straightforward, and cheap tools by citizen scientists (Steinmaus et al., 2001).

Citizen scientists have also been employed to effectively collect widespread geographic data on the distribution of soil-soluble arsenic near mining sites. For example, Ramirez-Andreotta et al. (2012) used citizen-scientists at the Iron King Mine in Southern Arizona to economically collect data on soil samples. Here, large groups of citizen-scientists voluntarily sent in soil samples from their lawns and gardens to be analyzed in a lab for arsenic, providing evidence that a large, effective citizen-science community exists at the Iron King Mine.
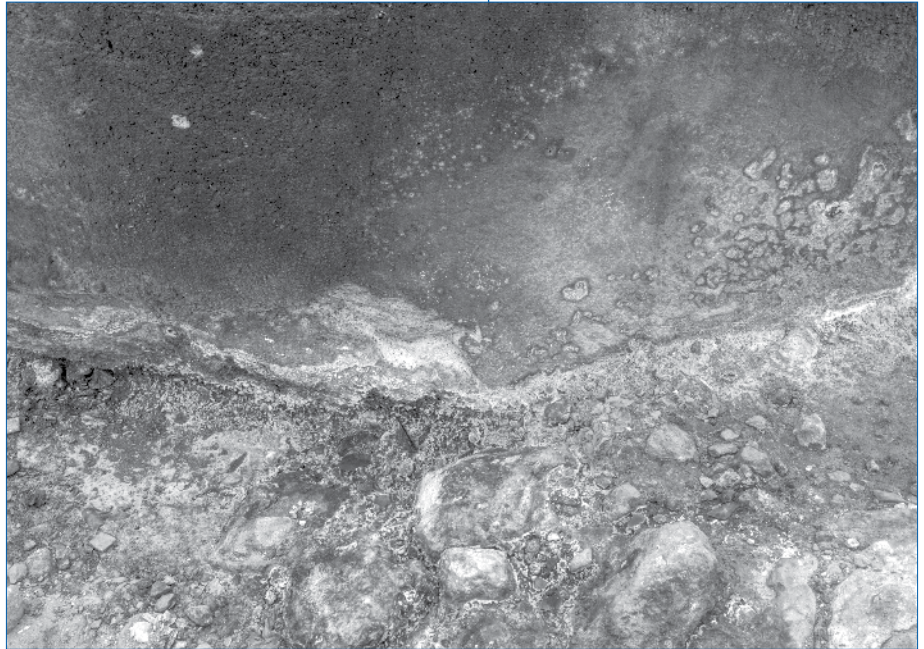
<u>Study Design Part 1</u>: Analyzing Proximity-Based Mechanisms

Although proximity-dependent patterns of arsenic distribution in water have been identified near the Villa de la Paz-Matehuala site in Mexico (Razo et al., 2004), dispersion mechanisms often depend on unidentified, location and season specific determinants. Therefore, the results of this study are not immediately generalizable to other mining sites, suggesting that additional research is needed to establish pervasive, universal patterns. In the first part of our study, we hope to confirm whether proximity-dependent mechanisms for arsenic distribution exist in water near the Iron King Mine in Southern Arizona, employing methods used by Razo et al. (2004) in concert with an active citizen-science community.

In order to quantitatively identify large-scale arsenic distribution patterns, we will obtain data over a one-week period by employing volunteer citizen-scientists in Dewey-Humboldt, Arizona to measure arsenic concentration in surface waters

on their property and in nearby ponds and streams. Arsenic levels will be collected with testing strips from the Hach EZ Arsenic High Range Test Kits, which change color based on the concentration of arsenic after absorbing small amounts of contaminated water. Citizen scientists will qualitatively match final testing-strip colors to those known to be generated by specific concentration levels – as provided with each kit – to accurately determine the degree of contamination. Geographical location will also be recorded at each collection site by citizen scientists using GPS information from smartphone devices. Finally, data will be consolidated through an online submission form, prompting volunteers to submit data containing arsenic concentration, GPS coordinates, and water source type (property surface water, pond water, or stream water). Time and date of collection will also be documented to account for changing day-to-day weather conditions, such as temperature and rainfall, which are provided by the National Weather Service.

From these measurements, we will calculate the total distance from the Iron King Mine to the provided GPS locations and conduct a multiple linear regression predicting arsenic concentration from distance, recent weather, and water source type. If a statistically significant value is observed for the linear fit between arsenic concentration and distance, proximity-based mechanisms for arsenic distribution are strongly supported.

Study Design Part 2:
Identifying Weather-Related
Determinants at the Iron King Mine

In addition to determining the relationship between proximity and arsenic concentration, we will identify specific environmental factors at the Iron King Mine that contribute to arsenic dispersion. Because location and season-specific determinants often affect arsenic concentration, distribution patterns may be unique to the Iron King Mine. Therefore, Dewey-Humboldt residents are particularly interested in weather-related determinants affecting their local distribution patterns, for the information can be used to reduce personal exposure and limit further contamination.

In order to identify environmental factors contributing to arsenic dispersion, weather-related patterns will be quantitatively compared to our citizen-science collected data. The Southwest Watershed Research Center (SWRC) and the National Oceanic and Atmospheric Administration (NOAA) provide public datasets containing relevant information, particularly data on wind trajectory, stream flow, watershed, and rain drainage. We will conduct a multiple linear regression for these factors, using distance down-field of each factor from the Iron King Mine as predictors of arsenic concentration. If statistically significant values are achieved for a linear fit, evidence for the associated, weather-related factor as a source of arsenic dispersion is strongly supported.

Qualitative representations of arsenic distribution also serve a useful role in visualizing results of statistical tests, which is especially important when relaying findings to affected residents. With arsenic concentration and GPS data previously collected by citizen-scientists, we will construct contour maps of arsenic levels around the Iron King Mine and adjacent residential areas to visually depict dispersion patterns. Geographical markers in the area will also be included, specifically wind trajectory, urban-area boundaries, stream flow, watershed, and rain drainage direction, to show relationships determined by statistical analysis. Together, results of statistical analysis and contour maps depict distribution patterns in a straight-forward, definitive manner.

Expected Results:

Although the ecological impacts of mining are confined relatively locally, accurately predicting these effects has substantial, global relevance, influencing policy and behavior in mining communities worldwide. Research regarding the spatial distribution of water-based arsenic near mining sites is both limited and in demand, serving local residents not only by reducing exposure, but also by guiding policy that limits the initial contamination. Through the proposed case study, we will gain fundamental understanding of specific, weather-related determinants involved in arsenic contamination at the Iron King Mine, while confirming proximity-based mechanisms and documenting areas highly concentrated in arsenic. Although arsenic distribution patterns often depend on location-specific factors, the breadth of research has found distribution patterns to follow the dominant weather patterns in the area, usually wind and water flow. For example, at the Iron King Mine in Southern Arizona, arsenic distribution patterns in soil have been found to be proximity dependent, following the prevailing wind patterns in the area (Ramirez-Andreotta et al., 2012). Distribution patterns of water-soluble arsenic are expected to also follow proximity-dependent mechanisms, dispersing through the same wind pathways as does soil. From the results, informed residents can both avoid contact with water from contaminated areas and design policy that limits further contamination by blocking weather-based pathways for arsenic spread. Until additional studies are conducted, however, the results of this study should not be generalized to other areas, as location-specific factors guiding arsenic distribution can differ among sites. Regardless, through studies of this nature, residents and mining companies will ultimately be able to proactively minimize ecological contamination and human exposure, preserving ecosystems and protecting personal health in the future.

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