



prized writing

2023 - 2024

Prized Writing

2023 – 2024

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Cover art by Annie Miyadi

Editor's Introduction

Marking thirty-five years of publication, this volume of *Prized Writing* continues the tradition of highlighting exceptional undergraduate student writing here at UC Davis. The nineteen pieces published this year span a variety of genres and a plethora of topics, creating an issue that offers insight on everything from fidget spinners in classrooms to *Wolbachia* in mosquitos. They represent what our trained faculty judges consider to be the approximately top 5% of submissions we received over the course of the year, speaking to the caliber of essays, case studies, literature reviews, reports, and articles, amongst other things, that were considered for publication. Thus, the longstanding success of *Prized Writing* lies in large part with the students who voluntarily submit their work to the journal. To every author featured this year, and to every student who took time to share their writing with us, I greatly appreciate your support as we continue our endeavor to publish exemplary student writing. I'd also like to thank Annie Miyadi for creating this year's cover, making it the third year in a row her work has been featured in the journal.

Support from faculty also plays an instrumental role in *Prized Writing* being the journal that it is today. Many students first find out about *Prized Writing* because an instructor included a featured essay in their syllabus or recommended to students that they submit a piece written for their class. Our faculty judges play an integral part of the publishing process as well, reading over the submissions and helping to decide which will ultimately be published and receive honorable mention. Volume 35 would not have been possible without this broad faculty support and, in particular, the participation of Melissa Bender, Erika I-Tremblay, Sophia Jin, Greg Miller, Andrea Ross, Karma Waltonen, and Nate Williams who acted as our judges over the 2023-2024 academic year.

Prized Writing is also fortunate to have the continued support of the University Writing Program, including John Marx (Interim Director), Carl Whithaus (Associate Director), Elliott Pollard, Anita Rodriguez, Darla Tafoya, Jasvir Mann, Kevin Bryant, Melissa Lovejoy, and Estelle Espinoza. The support we receive from our campus leadership, including Gary May (Chancellor), Mary Croughan (Provost and Executive Vice Chancellor), Philip Kass (Vice Provost– Academic Affairs), and Estella Atekwana (Dean of the College of Letters and Sciences) has similarly been vital to the journal's success as well. Finally, this issue would not be possible without the work of Prized Writing's two assistant editors, Loudon Nidy and Lucienne Brooker. There's a great deal of behind the scenes work that goes into building each issue; if it wasn't for the continued efforts of both Loudon and Lucienne, the publication of volume 35 wouldn't have been possible.

- Jillian Azevedo, Editor

Editors of Prized Writing: 1989–2024

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Vol. 1 (1989–1990): Eric Schroeder & Kathy Dixon

Vol. 2 (1990–1991): Eric Schroeder, Marlene Clarke, & Kathy Dixon

Vol. 3 (1991–1992): Eric Schroeder, Marlene Clarke, & Kathy Dixon

Vol. 4 (1992–1993): Marlene Clarke, Kathy Dixon, Jan Probst, Sondra Reid, Eric Schroeder, James Steinke, & Jayne Walker

Vol. 5 (1993–1994): John Boe, Marlene Clarke, Kathy Dixon, Sondra Reid, & Eric Schroeder

Vol. 6 (1994–1995): Gary Goodman with Cynthia Bates, Pamela Demory, Aliko Dragona, Lara Gary, Donald Johns, James McElroy, Sondra Reid, & Jayne Walker

Vol. 7 (1995–1996): Gary Goodman with Cynthia Bates, Elizabeth Davis, Pamela Demory, Aliko Dragona, Lara Gary, Paula Harrington, Donald Johns, James McElroy, Sondra Reid, Raquel Scherr, & Jayne Walker

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Vol. 31 (2019–2020): Gregory Miller

Vol. 32 (2020–2021): Jillian Azevedo

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Honorable Mentions

Jordan Alvarado, "'Dancing on a Grave': A History of Dodger Pride, White Capitalism, and Latino Culture"

Robi Castaneda, "Stradivari's Secret"

Cameron Datu, "Something Catchy"

Hadil Djardi, "'The War Without a Name': The French National Memory of the Algerian War of Independence"

Tangik Ghayvandian, "New Hybrid Surgery for Pulmonary Valve Repair Following Novel Surgical Valvotomy"

Mia Karlsson, "Intracellular, Extracellular, and Cytotoxic Effects of Abrus Agglutinin on Tumor Cells: A Comprehensive Review"

Muskan Mall, "How Fritz Haber got a Nobel Prize for Mass Murder"

Priya Ralh, "The dysregulation of the hypothalamic-pituitary-adrenal (HPA) axis in adults with a history of witnessing domestic violence throughout childhood: a literature review"

Isabella Vasquez Del Mercado, "How birth control can trick your body– And your state representatives"

FIGURE SKATING: SPINS, JUMPS, AND SPRAINS

AAYUSHA DAKWALA



WRITER'S COMMENT: Injuries are common among athletes and usually occur at the most inconvenient times. When Dr. Herring tasked us with writing a narrative about a specific branch of healthcare, I immediately knew I wanted to write about the Graston technique. Like many other athletes, I have suffered injuries, and the Graston technique has played a pivotal role in my recovery. My personal experiences with this technique have been transformative, allowing me to return to competition faster and stronger. Through this narrative, I want to take the reader into the mind of an athlete eager to compete, and demonstrate how such an athlete bounces back from an injury. My goal is to provide a comprehensive overview of the Graston technique, its benefits, and its impact on athletic recovery. In writing this narrative, I draw upon my journey and insights gained through my recovery process. I hope to convey the importance of effective injury management in sports and inspire others to explore this innovative technique.

INSTRUCTOR'S COMMENT: Sometimes the students contribute as much to the learning as the professor does, and our winning essay is a good example of that. For years, I was unhappy with one of my assignments in my Writing in the Professions: Health class, and at last grew so fed up that I scrapped it completely. I wanted an essay project in which the students described an innovation in the history of medicine, but in an informal style. I cooked up a new assignment, but said this to the students: "This is so new that I have no models for you. One of you is going to have to win the Prized Writing competition, and then

future students will have a model to follow.” Our winner, Aayusha, was in that class, and here is the model I needed, written as if to order; this essay is now on my Writing in the Professions: Health website. In it, Aayusha describes a breakthrough in therapy for soft tissue injuries suffered by athletes, and puts herself in the story, describing how she benefited from the technique after an injury. I had suggested a personal approach, but most students were a little nervous about adopting such a strategy. In this essay, it works like a charm, and I think future students will be less nervous about trying it.

- Scott Herring, University Writing Program

In the dazzling realm of figure skating, where every movement is a dance between elegance and power, I excel. The digital clock on the rink wall flashes 6:30 am, its red digits cutting through the silence enveloping the arena. Centered on the ice, I take a deep breath, preparing myself for what lies ahead. This is it—the final run-through of the morning, a chance to perfect my routine before the world championships, a mere three weeks away.

As the music fills the air, I glide across the ice with the grace of a swan, my body moving in harmony with the melody. Muscle memory guides me through each step, allowing me to embrace the chill of the morning breeze against my skin. With precision and poise, I execute the first jump sequence of my routine triple salchow double flip, landing effortlessly as if it were second nature. Transitioning seamlessly into my favorite part of the routine—the Biellmann spin, With a fluid wind-up, I kick my right foot behind me, feeling the familiar pull as my blade slices through the air.

All I tell myself is, this run has to be perfect.

I approach the most challenging section of my routine, one of my last jumps, the double axel double loop. I push my legs as hard as I can to gather enough speed, turn onto my back edge, and launch into the axel.

I hear my coach's words echoing in my head, “Tight core, big kick up, swing arms in, toe first into the ice.”

My foot hits the ice, but I lose my balance, falling straight down with a jolt of searing pain shooting through my ankle.

The music screeches to a halt, as I hear her shout, "Are you okay?"

Echoing the chaos in my mind, I couldn't come up with a response and stayed on the ground. I see my coach rush toward me, concern etched all over her face.

As she helped me up, I tried to put weight on my foot. I wince as a sharp pain shoots up my leg. "Ouch."

Once we are off the ice, she begins to take my skates off. My father, who saw me fall from the observation deck, is now downstairs assisting to take my skates off. I look down, and my ankle is the size of a balloon. Oh no, I think to myself. After 10 minutes of icing my ankle, it is so numb I can no longer feel pain. I chose to ignore the swelling and pain, thinking it would magically disappear while I was at school and I would go to the rink for my second training session as normal.

I arrive for my second training session of the day, and to my dismay, my ankle is so swollen I can not put my skate on.

"Do you think it's broken?", my father asks my coach.

My heart drops to my stomach. If my ankle is broken, there is no way I would compete at Worlds.

"I'm not sure, it's really swollen", my coach says as she checks my ankle, "I think you should get it checked out".

Training is quickly cut short, and I am whisked away to the emergency room. Miraculously, the X-rays reveal no fractures, but the diagnosis of a severe ankle sprain and bone bruise casts a shadow over my hopes for the championships. The orthopedic doctor's words are not what one wants to hear with a competition on the horizon.

"Rest, physical therapy, and above all, stay off the injured ankle for four to six weeks".

Like any competitive athlete, staying on the sideline was not an option. Determined to get me ready in time for Worlds, my coach got me in to see the team doctor for immediate treatment. To

reduce the amount of swelling on my foot, the doctor employs the Graston technique, a therapeutic method that utilizes specialized instruments to address soft tissue injuries.

The Graston Technique was developed in the early 1990s by David Graston, a Canadian athlete who suffered a knee injury. With help from other medical providers, he developed the specialized stainless steel instruments and established the protocols for the Graston Technique, which represents a groundbreaking approach to soft tissue therapy that has revolutionized the field of sports medicine.



Figure 1: Graston Technique Instruments.

The Graston Technique is a form of manual therapy used by healthcare providers, particularly in the fields of physical therapy and chiropractic care, to treat soft tissue injuries. It involves the use of specialized stainless steel instruments, varying in shape and size, that are meticulously applied to the skin's surface, targeting areas of adhesions, scar tissue, and other forms of soft tissue dysfunction (Figure 1).

Graston therapy for a sprained ankle is fairly common, and the team doctor says she uses this technique for many athletes. I explain to her exactly how I injured my foot, and then she assesses the injury. I point to the areas of tenderness, and she tests my range of motion. After she finishes, she explains to me how Graston therapy works. "First, we will stretch out your legs and ankle by doing a variety of motions to prepare for treatment."

A topical ointment is applied to prep the skin. The doctor then selects the GT-2 (Figure 2) and gently applies it to the skin over the sprained ankle, using specific strokes to break down scar tissue and adhesions, as well as to promote blood flow and tissue healing.



Figure 2: GT-2, an instrument used for therapy on the ankle.

“To decrease swelling, we start with the largest tool and work our way down” As the doctor works, I grit my teeth against the discomfort. My face turned red from the pain. This feeling was probably worse than my injury itself. “You okay?” she asks, “Let me know if you need a second to breathe”. I muster up a smile and nod, all I can think about is the idea of competing in two weeks. I tell myself, If this pain is what it takes for me to be able to compete, I can handle it. With each pass of the instrument, tension releases from my muscles, and I could feel the blood flow. Following the session, I work diligently on range of motion exercises, feeling the tension released from my muscles with each stretch. I wake up the next day in significantly less pain and with a significantly less swollen ankle. The therapy works, and I am ecstatic. Two days later, I am able to return to training; my foot fits inside my skate, but I still have a hard time jumping. For the next two weeks leading up to Worlds, I was to receive Graston therapy twice a week, ice therapy multiple times a day, and lots of ibuprofen. Graston therapy needs to be performed by trained and qualified healthcare professionals who have received certification in the technique, ensuring safe and effective treatment tailored to the patient's specific needs.

As Worlds draw near, I feel more confident. The Graston Technique has my ankle showing remarkable improvement, with swelling subsiding and range of motion returning. With renewed confidence and determination, I begin to do full run-throughs of my routine once again. I can now complete all my jumps with only minor discomfort.

One week later, I stand on the world stage, ready to compete. The day before I compete, my doctor performs Graston therapy. As I leave the room, my doctor says, "Take a deep breath and do your routine as you know it; your ankle will hold up." My body relaxes in relief. I know my body will let me compete, but hearing those words from the doctor is the reassurance I need to hear. As I take to the ice, I feel a renewed sense of strength and determination. Despite the lingering pain in my sprained ankle, I push through to give my best performance.

As the music fills the arena, I glide across the ice, each movement a testament to my resilience and determination to compete. With each jump and spin, I feel a twinge of discomfort, but it is overshadowed by the thrill of competition.

As I finish the last eight counts of my routine, I sigh with relief and strike my finishing pose. Just as my doctor says, my ankle holds up through my routine.

"Good job!," my coach says as I get off the ice, a simple but rare and meaningful comment.

Scores are announced soon thereafter, and I place 5th. It is not the result I hope for, but being 13 and one of the youngest competitors, coming off an injury and placing in the top 25% of figure skaters is pretty good.

As I look around the arena, lit up by the energy of fellow competitors and the supportive cheers of the audience, I feel a surge of gratitude. My coach, family, and the dedicated medical professionals all play crucial roles in my journey to be here. Their belief in me, coupled with my own unwavering spirit, brings me to this moment. The Graston Technique plays a crucial role in my journey as well. Its specialized instruments work their magic,

breaking down scar tissue and adhesions while promoting blood flow and tissue repair.

As I walk away from the rink, I know this is just the beginning. The path ahead will be filled with more spins, jumps, and possibly—but hopefully not—more sprains, but I am ready.

THE NARCISSUS SPLIT IN THE POND OF GLANCE BACK: HOW I LEARNED TO STOP WORRYING AND LOVE THE COMPUTER

MAYA GROARK



WRITER'S COMMENT: This paper was born from an open-ended research project that challenged us to take concepts we learned and apply them to some form of visual material. I had been following the works of the artist Maya Man for a few years and thought her photography program Glance Back would be a perfect subject. In a world where digital technology is not just a helpful tool but a required part of life, the digital landscape I find myself inhabiting feels relentless and inescapable. The computer and accompanying online space is both my best friend and my dearest enemy. This research was inspired by our relationship with our technology and how it has expanded our understanding of ourselves, transforming our perception of technology and what it reflects. Digital technology, like humans, is complex, and our relationship to each other and within each other is similarly so. How could it not be when we breathe life into these husks of steel with hearts of coltan and then don't know exactly how to feel about it after?

INSTRUCTOR'S COMMENT: Maya wrote The Narcissus Split in the Pond of Glance Back in the context of ANT 135: Media Anthropology, a demanding undergraduate course that explores creative image making processes and critical uses of techno-cultural forms in today's media ecology. The article speaks to her curious disposition and attunement to the vast repertoire of practices and concepts explored, problematized, and reconfigured in the class, including curation, trans-mediality, and the status of human practices in the age of digital technology. The quality of her paper is also a testament to her deep interest and

*The Narcissus Split in the Pond of Glance Back: How I Learned to Stop
Worrying and Love the Computer*

thorough engagement with the work of two key and difficult thinkers of media and technology we spent a great deal of time reading and discussing, namely Marshall McLuhan and Martin Heidegger. Equipped with preliminary insights from these texts, Maya directs her critical attention to Glance Back, an online platform and Google extension by a digital artist committed to both exploring human/computer interfaces and to challenging the impact of “hyper-curated identities” on the internet. By focusing on the strategies of randomness at work in Glance’s curatorial and image making practice, Maya draws our attention to other ways of being human on the internet. Her paper is therefore a welcome contribution to the ongoing dialogue between media anthropology, aesthetics, and curation.

- Tarek Elhaik, Department of Anthropology

There is a fickleness to understanding and contextualizing digital technology in a time when people must become more and more dependent on technology to survive. From the death of paper menus at restaurants to urban sprawl, technology is a necessary medium to navigate the world. The reliance on technology leaves little room for reflection and humans often find themselves cyborgified in a McLuhanian sense, where technology has become an extension of the organic. There is no tête-à-tête, or exchange of signs, between the human and computer, especially when there are accepted dichotomies in the world of organic versus inorganic, or science versus art. But in a paradoxical way, it is through digital technology that those dichotomies are investigated and complicated. Digital artist Maya Man created the Google extension Glance Back in 2019 as an exploration of the relationship between humans and computers and as a way to combat the highly curated identities of people on the internet. Randomly throughout the day, when a new tab is opened, Glance Back allows the computer to take a photo before prompting the user to note down what they are thinking about. There is no planning and no user control of the program. Simultaneously an archive and a photo diary, in the fast-paced media ecology that compounds

public identity with self-image, Glance Back creates a dialoguing relationship between the computer and the user. It gives a space to ask what separates us as two entities looking at each other through shared media, as well as gives a reflective space to regain a sense of self without the artifice common in the digital world.

The close, almost intrinsic relationship between technology and humans must first be situated in the works of Marshall McLuhan. Written almost eighty years ago about the electric age, McLuhan's work is still applicable as society moves into the digital age. McLuhan, in the documentary *The Medium is the Message*, begins by announcing a bold statement: "The electric age is changing you...and you are numb to it" (Mywebcowntube, 2016; 1:05). In McLuhan's mind, technology transforms humans in a way that they are unaware of because they are so inundated with it; like "scuba diving" in media in which the swimmer does not see the water, or media, because he is so immersed in it (Mywebcowntube, 2016; 8:05). The change that is happening revolves around how "any new medium changes the image [humans] have of [their] own bodies" (Mywebcowntube, 2016; 21:52). The digital age is a mutagen, and in it, media technology and the human body are no longer separate in the electric or digital age—the radio becomes an extension of the ears, the car is an extension of the feet, the computer an extension of the brain; humans have merged with their technology. With the computer or digital device as an extension of the brain—home of the self identity—there is no space to separate the user from the identity that they create online. In the digital age of instantaneous communication, that body is now a part of the "global village," a place where everyone has "extreme concern with everyone else's business" (Mywebcowntube, 2016;17:30). The media exchange through digital technology creates a world where the constant pressure of the panopticonal eyes of the other overlay the internal sense of self with the presentative persona crafted on social media.

That pressure, like the force that laminates sedimentary rocks, had compacted the external and internal monologue into one

flow. The internal sense of self is transmogrified into a chimera of performance and true self expression. McLuhan explains how the instantaneous nature of technology “brings images inside us, makes us want to control [them]” (Mywebcowtube, 2016; 22:24). With the current popular trends on social media being more personal—girls showing off what they carry in their purse; a step inside their city apartment to tour their decor; videos that proclaim “Get ready with me!” where a girl in a bathroom takes the viewer through her process of getting ready, usually while telling a story or explaining what she is getting ready for—rather than sketch comedy or clips of big parties, there is a reframing of private time as something to be consumed by others, a convergence of the public and private spheres. The quiet moments usually kept to oneself are broadcasted, which, in the media ecology of the internet, mutates the individual’s mind outside of social media to carry the same narrative flow. Often, as I get ready, I find myself narrating my own choices as if someone else were listening. After consuming these videos, after bringing them inside of me, I have begun spectatorizing myself. I look in the mirror and justify my choices as if defending against a public audience, I walk an invisible other through my hair care routine as if they were going to follow along and take my advice. It is not a conscious choice, but the natural progression my thoughts take. In this social media ecology, full of hyperchanging trends and hidden advertising, the body is not a body, but a vessel for consumption.

Glance Back offers a cure for this. McLuhan says that the “body precept” or unconscious notion of your body image, can only be revealed by a psychiatrist (Mywebcowtube, 2016; 23:00). This is because there is no reflective space for someone to analyze themselves, to escape the global village and remember their original internal perception of themselves. But Glance Back challenges this by forcing an uncured photo experience, “providing you with unexpected and maybe ugly photos of yourself” (Man, n.d.). The narcissism, whether self-obsession or self-curation, of the media one posts online, is interrupted. The computer captures highs¹, lows²,

and every regular day in between³. Before the computer takes a picture, there is maybe just enough time to smile or throw up a peace sign, but not enough time to, as Man (n.d.) puts it, say “wait let me fix my hair and smile and please take at least 10 photos just to make sure there’s a good one.” Over time, it creates an archive of user images that reveals a more honest image, an uncontrolled but organic form through which to view themselves and their life and the trends that they might not be aware of—the people they spend the most time with⁴ and the spaces they occupy⁵. And ultimately, it is a private experience. The candid photos only exist between the user and the computer. There is no pressure of the judging eyes of netizens, no worry of a digital footprint keeping a bad photo online forever. It is what makes it a true archival media rather than a social media, giving the user a place to reflect and understand who they are through the lens of external media, gleaning body precept without a psychiatrist.

But Glance Back is not only an archival space, it is also a space for the exchange of signs. In his essay “What is a Sign,” Charles Sanders Peirce (1998) posits there are three different signs: likeness (or “pictorial ideas”), indexical (a sign with a physical connection with its object), and symbolic (connected through ideas). A photograph is an indexical sign as there is a physical connection between the referent photographed and the sign created (the image of the user). The image of the user is captured through wired processes and computer code just like light exposure to celluloid creates film pictures. In that way, the photos taken by the computer are indexical, but they are also symbolic in that they carry more meaning than just true reproduction; they are also an exchange of ideas.

When the photo is taken, the computer asks “what are you thinking about?” creating a dynamic space of interface between the computer and the human. As the user, you are both referent and observer; signified and viewer. You are Narcissus, gazing at your reflection in the pond, but the reflection is also gazing back, for that moment, in that space, Narcissus has been split, you are removed

from your identity as one with the computer as you engage in an exchange of media.

Thus, Glance Back anthropomorphizes the computer because to have an exchange implies that there are two entities, complicating McLuhan's media extensionist theory. Peirce says symbols "grow... once in being, spreading among the peoples" where "in use and in experience, its meaning grows" (Peirce, 1998; p. 5). The core question Man (n.d.) asks with her app is "Doesn't your computer deserve a chance to glance back at you?" It creates an egalitarian relationship between the computer and user, both looking back at each other rather than a one-way connection of input to output. By answering the prompt with every image, the user responds to the computer as a conversational partner; this symbolic exchange creates a dialectic between the human and the computer while also creating a dichotomy between the external and the internal to explore. The photo is the external self while the prompt questions the psyche. The unexpected capture of the photo jars the user, unsettles them by reminding themselves that they are not in total control, and that is okay. The photos often capture incongruous images with captions, such as a sullen face but a happy caption⁶, serving as a reminder that physicality is not a representation of the mental space. The exchange, the tandem relationship between computer and human gives these pictures more symbolic power than one simple representation.

Furthermore, anthropomorphization is a credited form of mental reflection. While historically technology would be placed in the realm of the scientific, and not the natural world, the quasi-organic relationship between computer and human through Glance Back can thus be analyzed as the natural world is. Like the works of Jean Painlevé and similar directors as described by Maria McDougall (2000), the anthropomorphization of nonhuman entities creates a "poetic abstraction" or "atmospheric love story" (p. 16). Painlevé's films of sea creatures such as octopi or bats created a space to consider what makes something a human versus an animal and dissect post-WWI traumas. In his work, trying to understand

natural phenomena is what unsettles the human condition, and only through this unsettling can a deeper understanding of the self and nature be formed.

Naturalist Helen Macdonald postulates that there is a human tendency to “unconsciously and inevitably” view the nonhuman world “as a mirror...reflecting our own world view and our own needs, thoughts, and hopes” (Macdonald, 2022; viii). Macdonald, after the death of her father, learned to cope with grief and loss through training a fledgling hawk, Mable. It was her relationship with Mable that allowed her to “see through eyes that were not [her] own... to love those that are not like you... [and] to rejoice in the complexity of things (Macdonald, 2022; viii). To form a bond with the nonhuman establishes a natural human empathy that adjusts perspective, whether on the other entity or back onto the self. Like the relationship between the human and computer, Macdonald’s bond with Mable forced her to dissect her own feelings, complicated what it meant to be human versus the bird and what they had in common. Glance Back’s estrangement of the familiar (the ownership or command that we associate with our devices) also creates a reflective space to ask where the computer begins and the human ends, as well as who you are when you are truly reflected back without the artificiality of social media pressures.

Bond and relationship are lexically significant here. It is not just a symbolic imagining that allegorizes the relationship between a falconer and her hawk to the relationship between a human and their technology. There is a true relationship. Whether that of friends, owner and subject, or beleaguered allies in a world that does not allow for a human to exist without technology, the computer is both an extension of the user and a separate entity. The computer could be considered a co-author of this paper, who transcribed my thoughts as I dictated them through keystrokes, my digital secretary who remembers things for me when I don’t have time to commit to it myself. Throughout my time writing this paper, when Glance Back prompts me, I been responding by saying I am writing about you, or my best friend⁷. Glance Back

has personified a device I once only considered to be a tool for the two years since I downloaded it, reshaping my own considerations on what constituted a didactic relationship and reflecting back a refracted version of myself that could have been lost in the roaring waters of the torrential flow of social media.

The repetition of the word reflection and reference to mirrors is curated because while the argument has been made that the computer and the human have a relationship that is more than just images on a screen, the literal reflective nature of technology is also important to analyze. Netflix's hit show *Black Mirror* is named as such because when a digital device is turned off, that is what it becomes: a black mirror. You can see yourself reflected in the darkened glass, making technology reflective in a literal and figurative sense. It is the mirror stage of the adult life; only by recognizing your reflection and understanding that it only shows a part of you, can you understand what it means to be whole. In Martin Heidegger's piece, "The Question Concerning Technology" the titular question is what the "essence of technology" is. He introduces the term "poiësis," the Greek word for bringing forth, in the way the blossom brings forth the bloomed flower and a further form of that, "physis," which is the "arising of something from out of itself" (Heidegger, 1977; 10). The reflective nature of the computer brings forth a new form of human. *Glance Back* taps into a form of physis to both unite and divide the technological and the human.

This veers dangerously close to mixing oil and water by putting McLuhan and Heidegger together, despite their oppositional views. The reflection from the computer reveals how humans have changed from the effects of technology. Technology has changed the way humans view ourselves, how we interact with the environment, the social order and mores. On McLuhan's side, at this point in the digital era, there is no doubt that technology has become an extension of the human and humans are reliant on the powers that technology can give, whether it is consensual or not. Heidegger's focus was on what technology turned the natural world

into, setting into an opposition where technology is what turns the natural world into resources, or a “standing reserve” that humans may take from at will (Heidegger, 1977; 20). Again, Glance Back turns this on its head. Heidegger imagines technology as something that only humans use. But are humans not also used by computers?

In the world of Glance Back which offers equal power to computers to enact actions on the human, it is then possible to see another form of tandem interaction that is perhaps scarier than the egalitarian friendship illustrated before. Glance Back uses the interaction with humans to build the archive; computers and their programs were created to accomplish a task, a Sisyphean journey of constant use literally coded into them, no end in sight. Heidegger says technology turns nature into resources for consumption, but humans have used technology to turn themselves into something for the computer to consume. While a Wachowskian Matrix¹ imagining of what a human resource would look like can be entertaining in film, it is not as sinister in real life. But by encoding a program to continually serve, it is similar to a will to survive, a will that is dependent on humans acting as users. In a digital space of predatory algorithms designed to keep users clicking and interacting, many facets of the relationship between human and computer is actually another human turning your personal device against you. Glance Back is one of the few programs without an ulterior motive. It is an art project, a not-for-profit digital experience.

In the digital ecology we find ourselves in, “we lose both an awareness of self and of the real world context surrounding us.” Glance Back “[disrupts] that trance and [reminds] you that you are here and your computer is there” (Man, n.d.). Contextualized through Glance Back, this relationship—love story or sordid affair, depending on the philosophy—that is currently taking place in

¹ The Matrix is a post-apocalyptic movie directed by the Wachowski Sisters from 1999 where humans are used as fuel to serve an artificially intelligent computer

the digital landscape between human and computer is that of a conjoined twin. There is a bond between the human and the computer; we are connected but humans are not left “paraplegic” without our technology, as McLuhan describes because computers are also a distinct partner with which we dialogue (Mywebcowtube, 2016; 21:52). We are two entities connected in the way that the digital ecology demands the way a two headed frog steps into the pond after being born into a nuclear waste site.

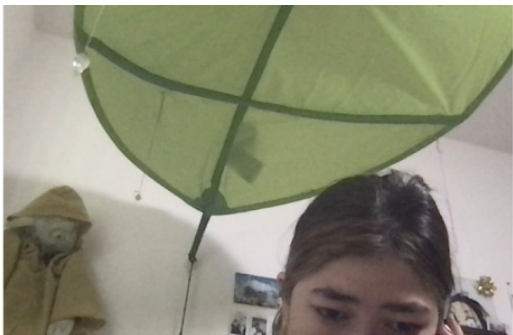
Despite his warnings, Heidegger was neither technophobic nor technophilic², and that is the encompassing reminder that a media analysis of Glance Back can provide. To view technology as nothing but a tool discounts the reflective power of unsettling our own assumptions about ourselves, reminding us that not all life is a performance in the consumerist culture of the digital age. To view it as a pet or an innocent best friend runs the risk of forgetting that the computer is designed by human hands stained with the green ink of consumerist capitalism and many innocuous digital interactions are carefully designed experiences to keep you in the thrall of consumption, performance, and production. However, to only see it as the enemy or something to fear telescopes us into a bleak future. It is important to worry less and analyze more. Technology can be a tool, something to be wary of, and also a friend. It is the multifaceted nature that makes an analysis so rich. We are both entities growing and changing at a rapid rate, metastasizing into each other—a foreign body that comes from within ourselves—both caught in an endless task of existing, of pushing the rock up the proverbial hill. One must imagine the computer happy because it is, in a way, also imagining us happy.

² Technophobic and technophilic are also explored in Kriss Ravetto’s book, *Digital Uncanny* (2018).



bee!

Figure 1: The highs



not now please

Figure 2: The lows



pachamamaing again 2day

Figure 3: Everything in between

The Narcissus Split in the Pond of Glance Back: How I Learned to Stop Worrying and Love the Computer

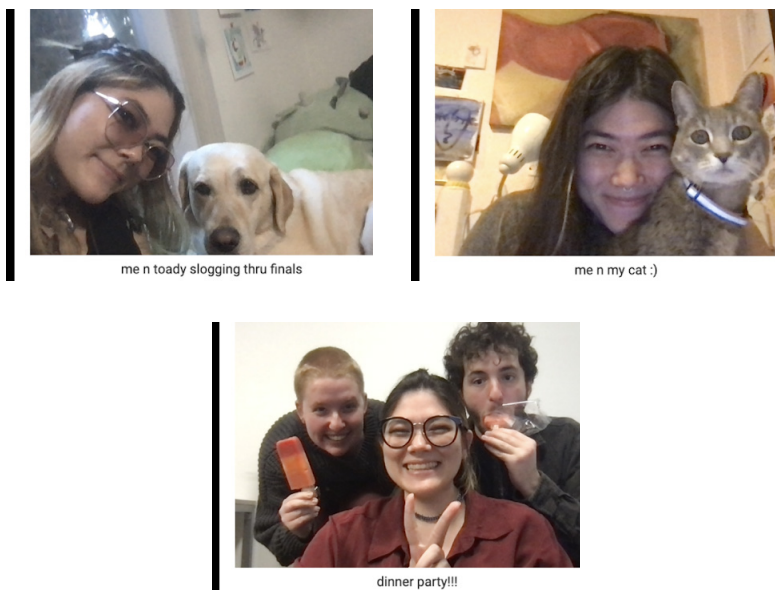
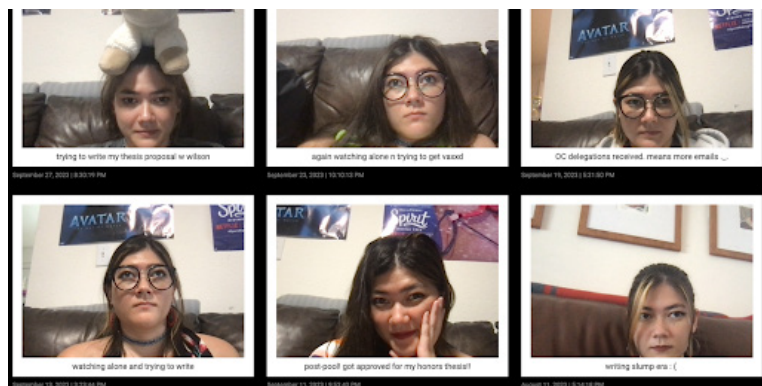


Figure 4: The trend of “people” frequently appearing in my archive



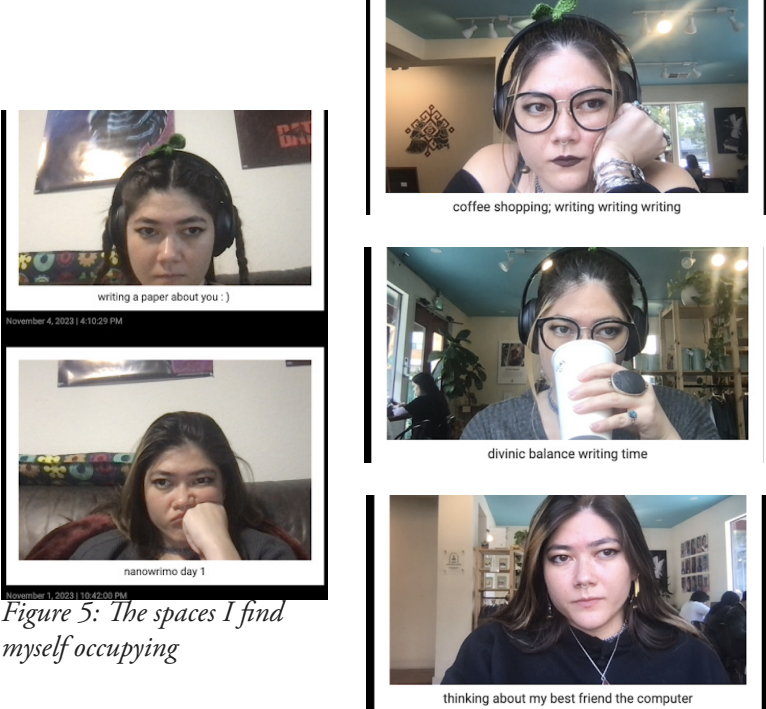


Figure 5: The spaces I find myself occupying

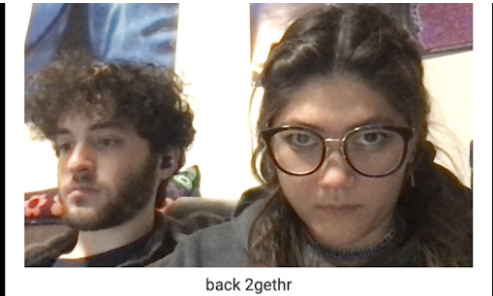


Figure 6: The duality of man (I felt ecstatic when this was taken)

*The Narcissus Split in the Pond of Glance Back: How I
Learned to Stop Worrying and Love the Computer*

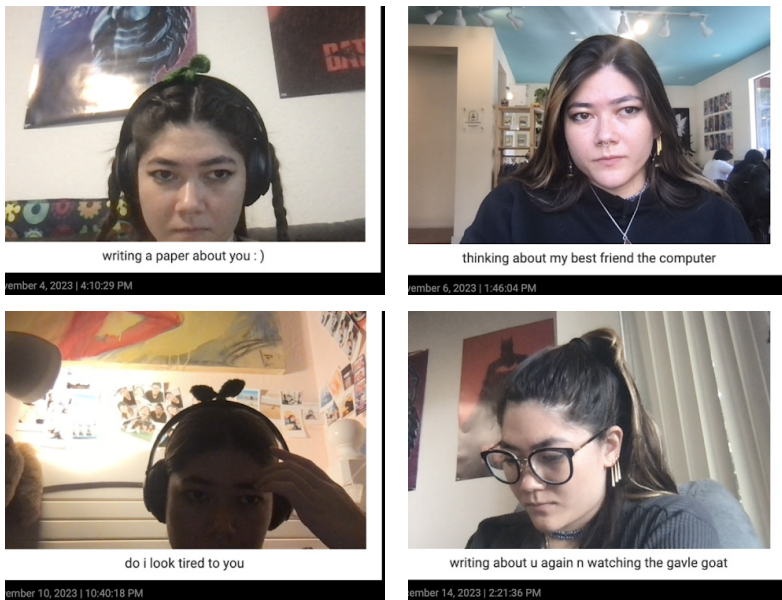


Figure 7: My best friend the computer

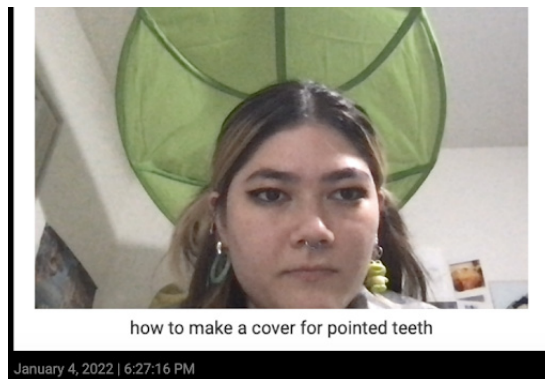


Figure 8: The beginning of our relationship (Jan. 4, 2022)

IN THE PRESENT, AND IN THE FUTURE: HOW SACRAMENTO'S LOAVES AND FISHES BLENDS OUTREACH AND ACTIVISM IN HOMELESS MINISTRY

SONORA SLATER



WRITER'S COMMENT: During winter quarter, in the overly warm, no-cell-service wasteland of Hutchinson Hall's basement, I and approximately 10 other students met weekly for what was undoubtedly the best class of my undergraduate education (other than Tractor Driving). Professor Sasha Abramsky used every minute of his Investigative Journalism lectures to engage us in debates, read us examples of excellent reporting and convince us that for once, doing the required reading was going to be worth our time (it was). When he assigned us an article focused on issues of housing in California, I was excited, but unsure where to begin. Investigative reporting is meant to expose problems, but I've learned that I also like to dedicate space on the page to highlighting solutions. So although I included a realistic analysis of the current weaknesses in support for the homeless in the region, I mainly dedicated my piece to highlighting the work of one group using a multi-pronged approach, from free meals to legal assistance and spiritual guidance, in order to care for the unhoused population in Sacramento.

INSTRUCTOR'S COMMENT: Sonora Slater was a student in my social justice writing class. From the get-go she wanted her focus to be on the ways in which faith-based individuals and groups can work on the homelessness crisis in California; and how tending to the needs of the homeless goes beyond simply advocating for a roof over their heads. Covering these topics is difficult, and involves journalists getting out of their comfort zone. For a young student journalist, without years of experience in the field, it is doubly-difficult. Sonora approached her

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topic with gusto, interviewing numerous people, and writing with a mature sense of empathy. It was an extraordinarily effective project, and one that I am delighted she managed to bring to fruition. She brought stories and voices to life and synthesized a vast amount of information in telling her story. Sonora's publication in Prized Writing is well-earned, and I am most glad that the judges saw the stand-out qualities of her writing.

- Sasha Abramsky, University Writing Program

George Kohrummel calls it a “listening ministry.” “We don't preach, and we don't prophecy,” Kohrummel said, walking past a row of outdoor benches arranged like church pews. “We meet our guests where they're at.”

Kohrummel was describing Sacramento faith-based homeless outreach organization Loaves and Fishes. More specifically, their “Side-by-Side” ministry — a group of people who gather every morning, Monday through Friday, in an area Loaves and Fishes runs called Friendship Park, to lead a prayer circle with homeless guests.

Loaves and Fishes began in 1983, run by a former nun and a priest. It hosts a variety of services and programs, serving meals to up to 800 people daily, providing long-term overnight housing to up to 16 women at a time via Sister Nora's Place and even offering a kennel service for the pets of unhoused people, as well as jail visitation, legal and mental health services. But according to Kohrummel, who serves as the director of Friendship Park, a big part of their purpose is not just to promote one religion: in fact, guests at the park aren't allowed to “boast about [their] faith.”

That doesn't mean they can't talk about it. Kohrummel said that they encourage open conversations between people with different faiths.

“I can tell you that it works,” Kohrummel said. “We all just listen and hear each other out. Peoples' opinions count, and they do matter. But [...] people can learn from other people. It's about

sharing life, and history and beliefs. And that way, you have a better understanding of your neighbor.”

Usually, Side-by-Side is led by Reverend Linda, who’s been with the program for years. She’s currently on a four-month leave, but the morning prayer circles have continued, led by a rotating team of volunteers.

Opening the door to Rev. Linda’s office within Friendship Park, Kohrummel said that it’s a space she usually uses to talk to guests “about religion, about their day, about anything that’s going on in their lives.”

The small room has two rows of three plush chairs, a stained glass semicircle leaning against the window and a basket of printed out Psalms and other scriptures. Focus is pulled to a wooden circle on one wall that displays six emblems: the Christian cross, the Jewish Star of David, the Taoist Yin and Yang, the Islamic Crescent and Star, the Buddhist eight-spoked wheel, and the Hindu Om letter.

Although Rev. Linda isn’t in her office currently, the outdoor ‘Gazebo 4’ acts as the same kind of space each morning: A place where guests know each other by name, where they can be honest about their struggles and where they can feel the kind of support they might not feel throughout the rest of their day.

One Friday morning, Monica introduced herself as that morning’s leader, and guided the group of around 10 people gathered together under Gazebo 4 through prayer requests and discussion of a daily devotional.

One person prayed for a job. Another prayed for all of the homeless to be safe. Another prayed for understanding in the community and in their relationships with each other. Another prayed for those struggling with addiction, and for an end to fighting and violence in the streets.

“Praise God,” said one. “Thank you for another morning together. Thank you for allowing us to wake up today.”

One man with a long beard and a weathered Bible was fairly quiet throughout the conversation, except for occasionally nodding

along with a “Hallelujah!” or a “Praise the Lord!” But eventually, he spoke.

“We all got problems, but Jesus is gonna give us the hidden mystery of what we need,” he said, standing and gesturing to the small crowd as though the picnic bench was his pulpit. They shifted to look at him, holding on to each word he said. “Because you spent the time with your brothers and sisters now, there will be a point where a light comes on and you know what He wants from you. You’ll know there’s some hope and you can go on. And you will.”

A woman named Sue sat nearby, having shuffled in mid-way through the discussion. “Moses,” Sue said. “I think we should collect money to send you off to college to officially become a pastor. Would you like that? Don’t you want to get out of here?”

Moses sat down, and shook his head, smoothing out the pages of his Bible before turning to look at her.

“Thank you, Sue,” he said. “But I’m right where Christ wants me right now.”

Elum Webb-Willard said that he’s been homeless since 2012, on-and-off, and despite his struggles, has experienced faith in a different way because of them.

“Money is the root of all evil,” Webb-Willard quoted — 1 Timothy 6:10. “Money might push you away from religion, because it gives you the things that religion gives. Hope. Being taken care of.”

Beyond the day-to-day

Friendship Park focuses on the here and now — it’s a place where homeless guests can take a nap during the day, have a meal and a cup of coffee, take a shower, play a game of cards. This plays a vital role in creating a safe space for unhoused people in Sacramento to exist in and for them to build community. But Kohrummel noted that when the sun goes down, Friendship Park closes its gates, as it’s not meant to serve as an overnight shelter. And then, each night, their guests once again have nowhere to go.

This is where advocacy comes in.

Loaves and Fishes has an advocacy team of their own, calling for more permanent supportive housing, and on the broken systems that often lead to homelessness, such as medical debt, to change. Closer to home, the Davis Homelessness Alliance has brought together the city of Davis, the UC Davis campus, local schools, businesses, non-profit organizations and faith-based organizations to work toward permanent solutions to homelessness in Davis.

One of the groups involved in the work is called Interfaith Housing Justice Davis. Neil Redenbaugh, a pastor at FBC Davis, is a member of the group, and outlined the two kinds of support he believes homeless people need.

“One is relief. They just need shelter, they need food,” Redenbaugh said. “And then one is more development work. How can we help you move from always needing relief and emergency aid into some long-term care?”

While faith-based organizations are often very good at providing the first kind of care — according to a 2017 paper from the National Alliance to End Homelessness, nearly 30 percent of emergency shelter beds at the national level are operated by faith-based organizations —

the second is sometimes overlooked. Interfaith Housing Justice Davis, a coalition of faith organizations in Davis who advocate for changes in city policy to encourage more affordable housing, is trying to change that.

Recently, co-chair of the IHJD Ellen Kolarik published a letter in the Davis Vanguard urging residents to vote ‘Yes’ on the November 2024 General Tax Revenue Measure in Davis, for the purpose of ensuring a well-funded Housing Trust Fund.

The city of Davis’ HTF, according to Kolarik, plays a variety of roles in funding emergency shelters, transitional housing, permanent supportive housing and supporting low-income renters. The article notes that a March 2022 California Affordable Housing Needs Report showed that renters would need to earn 2.8 times the state minimum wage to afford average rents in California. The UC

academic workers who went on strike in fall 2022 cited high rents as one major reason for their demands.

In addition to potentially helping Davis build more low-income rental units, the article argues that a voucher fund providing a few months of rent assistance could also be created from an HTF, protecting from evictions. Although the general revenue measure, if passed, cannot be earmarked for a specific purpose, Kolarik said that IHJD would advocate for the city council to

“make funding the Housing Trust Fund a priority” if the funds come through.

Tanya Olivs, who recently began coming to the prayer circle, said that she was unlawfully evicted from her apartment in Davis. She has since shuffled around between motels, Fourth and Hope shelter in Woodland and the Salvation Army shelter where she was staying as of Feb. 16.

The father of her son lives in Mexico, and she said that she didn't want to “burden” her children who do live in the country with her problems. But the problems are hard to handle on her own — she lost many of her belongings during the eviction, her suitcase of clothes was recently stolen and she reported having been repeatedly threatened by a woman on the streets.

“All the trauma has made me draw closer to God,” Olivs said. “I call out to him for help all the time, but it's hard. I guess God can only do so much.”

Faith, dignity and being known

“Everybody has equal dignity,” Redenbaugh declared, when asked what about his faith makes him believe it is important to care for the poor.

He went on.

“From a Christian perspective, we believe that everyone is created in the image of God,” he said. “And then through scripture, Jesus is always elevating people who are put down by society. God is a God of shalom bringing — wholeness and well-being. So we want to try and do that as much as we can.”

For Kohrummel, this idea of human dignity is lived out every day, as he gets to know not just the names of the guests at Friendship Park, but also their stories.

Part of being a community, Kohrummel said, is knowing that you will be remembered. That's why Friendship Park, alongside their rows of outside pews, is home to a Memorial Wall, where the names of guests who have since passed away are carved into the stone.

They hold a memorial service for each guest who they know has died, according to Kohrummel, as well as reading their names on Dia De Los Muertos each year.

"You might spend a couple of years with one individual every single day," Kohrummel said. "And you might not have an all day conversation with them, but you'd have contact with that person every single day, and you become very close. That's something that is very important for everybody: to know that they're not forgotten."

As much as this is something that volunteers at the organization try to do for guests, it's clear that it's also something the guests do for each other. One man named Dennis expressed frustration during the prayer, saying that he had lost his wallet and he was pretty sure someone had stolen it, but that he was doing his best to control his anger over the situation. The others encouraged him to not seek revenge — and it was an encouragement built out of knowing his

story.

"You don't want to go back to jail," someone told him. Another said, "You've come a long way— that's righteous anger, but you've kept it in check."

Dennis shared that he had faced a wrongful conviction years before, and now came to Bible study every morning. "Life will take you to and fro if you don't have a guiding light," Dennis said. "I want to turn things around in 2024."

"You don't want to give up your goals for short-term gain," another attendee reminded him.

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This sense of community, the kind that knows each other's stories, and cares about each other's futures, is also shaped in part by the larger city community around it — be it Sacramento or Davis.

In April 2023, a homeless man named David Breaux, but known to residents as “Compassion Guy,” was killed in a stabbing in downtown Central Park. He was known for sitting on a bench on a street corner in Davis, asking people for their definition of compassion, and writing down their answers in a notebook he carried around.

In honor of Breaux, the street corner was symbolically renamed with a city-authorized “Compassion Corner” sign at the spot where he once sat. In reflecting on the Davis community, and the way they interact with the homeless community, Redenbaugh referenced the city's reaction to Breaux's death.

“Maybe in larger cities, people who are living on the streets, they're just kind of part of the scenery, I don't know,” Redenbaugh said. “But in Davis, [they're] a known and loved part of the community. They're not just strangers sleeping on the road, right? We know these people. We love them. We're going to name our street corner after them.”

Monica lives by this idea, greeting guests one-by-one as they enter the gazebo with their breakfast and instant coffee and, during their gathering that morning, telling the attendees, “A lot of things that make a difference don't cost a penny — calling someone by their name.”

For some of the unhoused in Sacramento and Davis, a faith that God cares for them by name is central to what keeps them going each day. And when it's hard to believe that's true, organizations like Loaves and Fishes make that faith tangible. Even if they can't believe that God cares for them or knows them by name, Monica does. And the other people in their prayer circle do — and that means something.

By 9 a.m. in Friendship Park, the city was stirring to life; the sun peeking through hazy clouds, the air filled with the sound of

car engines and train whistles. Monica closed the prayer circle by adding one more sound to the cacophony, holding a piece of paper with old lyrics and inviting the guests to sing with her: “Amazing Grace.”

*“Through many dangers, toils and snares,
I have already come;
'Tis grace hath brought me safe thus far
And grace will lead me home.”*

FOX SPIRITS, FEMME FATALES, AND THE FEAR OF FEMALE POWER: MALE FRAGILITY THROUGH THE LENS OF MING DYNASTY WOMEN

HOLLY ZHENG



WRITER'S COMMENT: I still recall the first day of the Chinese new year when I walked downstairs dressed head to toe in red, only to find my two cousins, both mainland Chinese, dressed casually in everyday attire. Having been born in America, I've always felt it necessary to cling harder to my culture than my cousins, who have grown up immersed in it. This desperation to feel connected to my culture influenced more decisions than I'd like to admit. The prompt in UWP 101 was to tackle a modern issue, but given the freedom to choose any topic we wanted, I instinctively turned to my own special interests and molded it to fit the assignment requirements. Exploring the role of misogyny within a society like imperial China was an opportunity I could not pass up, and as I delved into my research, I recognized how it served as an interesting parallel for modern discourse. My hope is for my paper to not only educate, but also to spark meaningful conversation that will resonate with readers.

INSTRUCTOR'S COMMENT: Holly Zheng's "Fox Spirits, Femme Fatales, and the Fear of Female Power" delves into the fascinating interplay between gender, power, and cultural mythology in historical China. Her writing is vivid and compelling, bringing to life the legends of fox spirits and their connection to powerful women like Empress Dowager Wenming. Holly's essay not only explores the deep-seated fears of female power that these stories reflect but also ties these historical narratives to ongoing gender biases today. She skillfully weaves historical analysis with cultural critique, showing how the past continues to shape present perceptions of female authority. Holly's work makes a

strong case for the relevance of historical narratives for understanding modern discussions of gender and power. It was a pleasure to see her work on this essay and develop this engaging piece of writing into its final form.

- Carl Whithaus, University Writing Program

While roaming the streets of Northern Wei dynasty China, it is imperative that all young men stay vigilant. Legends, perhaps spurred by the warnings of the Empress Dowager Wenming, speak of malevolent spirits that lurk in the shadows and cut hair from unsuspecting civilians, effectively severing their souls from their earthly body. One should never be too cautious, especially when a mesmerizing woman with sultry lashes and an intoxicating laugh tempts you closer. Her allure may be inescapable, but beware; she just may be a malicious fox spirit, hungry and ready to devour her next victim's soul.

This was the rumor that was circulating in 477 A.D., when Empress Dowager Wenming had assumed control of the imperial court following her husband's demise (Kang 19). She had been serving as regent for 12 years when these strange incidents of haircutting surfaced. Hair held profound significance in Chinese culture, largely stemming from Confucian beliefs asserting that each part of a person's body is sacred. Cutting one's hair was seen as a sign of disrespect to one's parents, as every part of a person's body was formed from the selfless sacrifice of their mother. This reverence for preserving one's body untouched, combined with the widespread superstition that having one's hair stolen by a sorcerer equated to an individual's soul being stolen, ignited panic amongst the masses. Despite Empress Dowager Wenming's rigorous punishment of the culprits in the form of issuing severe whippings, the public perceived these incidents as a divine omen that her reign defied the will of the heavens. This narrative linking the deceptive fox spirit to her rule tarnished the Empress Dowager's reputation, suggesting that any defiance of the prevailing patriarchal system was not only shameful, but also subverted the cosmic balance of yin and yang. Thus began a larger, troubling trend wherein men

systematically undermine the legitimacy of women in power by tying them to sexual impropriety or freedom, a tactic designed to both suppress women's authority and undermine female autonomy.

Empress Dowager Wenming was not the only imperial figure linked with the fox spirit. Wu Zetian, China's first and only female emperor, was often labeled as a fox spirit due to her reputation as beautiful, ruthless, and quite the seductress. Rising from a fifth-rank concubine to empress at an impressive pace, her swift ascent to power drew considerable attention, raising suspicions nationwide (Dien 38). When the crowned prince passed away less than a year after her husband's demise, the convenient timing of it all led many to raise an eyebrow at Wu Zetian's complete reign over the imperial court, being the first woman to rule China not in place of a man, but as the one true emperor.

Historically, leaders associated with times of affluence are celebrated, irrespective of their personal characteristics. Objectively speaking, Wu Zetian's reign was marked by prosperity, with many deeming her rule the peak of the Tang dynasty. Yet, in the annals of history, she was remembered as a tyrant that ruled with an iron fist, the embodiment of a manipulative, power-hungry fox spirit that cheated her way to the top. The unsavory portrayal of Wu Zetian is an anomaly, particularly given the idealization of the Tang dynasty, often viewed by the Chinese as a golden era of their culture. This disparity in perception can be attributed to one distinguishing factor: her gender. In fact, the outrage her powerful position sparked among men significantly influenced the political trajectories of women in the subsequent generations.

Even long after her death, the shadow of Wu Zetian's influence loomed large. Rumors about her grew continually distorted to the point where modern day historians can hardly distinguish between fact and fiction. One particularly pervasive story that gained traction was of Wu Zetian taking numerous male lovers following her husband's demise. While such information might stem from what's typically regarded as a historical source, that isn't to say that these accounts were immune to any bias. It was not uncommon in

ancient China to tarnish the reputations of powerful women with allegations of polyandry. In fact, some argue that the bias against Wu Zetian was so widespread that conventional "evidence" of her multiple relationships should be taken with a grain of skepticism (McMahon 38).

The recurrent link between influential women and promiscuity warrants deeper scrutiny. Such characterizations were not exclusive to Wu Zetian; other prominent women faced similar insinuations. Empress Dowager Cixi, for instance, was rumored to smuggle men into her palace, and after engaging in intimate affairs, would promptly murder them. The exact same accusations were directed at Jia Nanfeng, the wife and empress of Emperor Hui of the Jin dynasty (McMahon 35). As the list for similar cases goes on and on, it appears that many Chinese women of authority were seemingly destined to be labeled as sexually insatiable. These portrayals were often perpetuated by men who penned "biographies" of these historical figures, even though many such accounts are now described by scholars as "semi-fictional." Nonetheless, such narratives likely cemented the notion that power and female leadership were inevitably intertwined with sexual impropriety.

The ramifications of these rumors were profound and incredibly widespread. Beginning with the Song dynasty, imperial women painstakingly distanced themselves from any resemblance, in demeanor or appearance, to Wu Zetian. This sentiment became so pervasive that by the Qing dynasty, the Manchus—a group of people living adjacent to the Chinese—embraced Chinese notions of widow chastity (McMahon 43). Even their noblewomen took extensive measures to avoid being branded as promiscuous and thereby immoral. Being likened to Wu Zetian became the ultimate insult, even to foreign women. Consequently, juxtaposed against the backdrop of powerful women associated with polyandry, the image of the virtuous woman emerged as the paragon of femininity.

Along with the rise of the Ming dynasty, the cultural landscape for women underwent a radical transformation. In previous dynasties, women often held political voices and commanded

respect. However, the Ming dynasty instituted laws barring women from participating in politics, and further passed legislation that made it difficult for widows to remarry (Bossler 150). Coupling with the cultural pushback against women with agency, there arose a heightened appreciation for loyalty and devotion in women, with pronounced disdain for perceived promiscuity. Because the prevailing expectation now dictated that women be the epitomes of virtue and obedience, the traditional lifestyles of Ming dynasty women were fundamentally altered. As with many patriarchal societies, the Ming dynasty designated two clear domains: the domestic home for women and the outside world for men. However, during the Ming dynasty, this distinction was taken to the next level; women ultimately did not leave the house unless they were accompanied by a man. And on those infrequent outings, women were expected to remain hidden, out of sight.

Yet, the confinement indoors offered an unexpected silver lining. With ample time at their disposal, women were able to pick up hobbies and cultivate them. Writing emerged as a particularly favored pastime. Women began writing to ladies of different households, nurturing friendships through letters. Given societal norms, many of these friendships blossomed and flourished solely through this correspondence, with the women oftentimes never meeting face-to-face. Nonetheless, they frequently exchanged gifts, ranging from valuable treasures to symbolic tokens, forging profound connections. Through this network of exchanges, women were able to broker alliances, negotiate favors, ease conflicts, and on occasion, secure discretion (Hinsch 151). So while they were excluded from official roles of authority, the resourcefulness and cleverness of women allowed them to forge a path to power and influence in subtle and discreet ways.

The prevailing idealization of female virtue also carried with it the expectation of unwavering loyalty to husbands and their families. This cultural backdrop witnessed the emergence of a disturbing trend: women resorting to self-mutilation to demonstrate their devotion. Early tales spoke of women slicing

off a piece of their flesh to feed ailing loved ones, rooted in the ancient Chinese medicinal notion that the flesh of a loved one was a potent medicine (Hinsch 166). The narratives only grew more harrowing over time. They spoke of widows deliberately mutilating their genitals as a pledge of lifelong celibacy after their husbands' deaths, and even tales of women committing suicide, aiming to accompany their departed spouses into the afterlife. These dramatic stories were widely circulated, often being heavily romanticized, further fueling the burgeoning "cult of chastity" in Ming dynasty literature.

Another act of self-mutilation committed by women that arose in the Ming dynasty was the practice of foot binding. A bound foot expressed the ideal version of femininity, representing a woman's sexuality, beauty, and submission. In order to achieve this look, women broke their bones and folded their toes beneath the soles of their feet (Wang 3). Then, they would bind it with cloth until the broken bones fused together, creating a 3-inch long hoof-like stump, which they decorated with miniature cloth shoes and embroidery. This process often began in early girlhood, and was believed to be a right of passage that ensured favorable marriage prospects. The shape of a bound foot was compared to a lotus, and was, ironically, considered very erotic (Hinsch 168). It's intriguing to note that certain aspects of eroticism appear more enticing to men when they are the ones occupying positions of power, as evidenced by practices like foot binding, which subjects women to immense pain and confines them to their homes, therefore forcing women to become dependent on the men around them. Yet, when a powerful woman, such as the legendary Wu Zetian, expresses her sexuality freely, men of the patriarchy don't react with admiration, but instead actively recoil. This raises questions about whether patriarchal men are more inclined towards women only when the women are at a vulnerable disadvantage.

It's noteworthy to consider that apprehensions about women in positions of power persisted long before the Ming dynasty. What, then, catalyzed the severe downward trajectory in women's

rights during the Ming dynasty? One factor may have been due to the blossoming technological and economic advancements at the onset of the Ming era. The emergence of small factories and the boom in foreign exports marked a shift in the economic landscape. As a consequence, many left behind their lives as farmers to transition to more urban, merchant-based roles. This shift meant that many men, as merchants, were often away from home for extended periods. To maintain their sense of security regarding their wives' fidelity during their absences, some men reinforced and emphasized the virtues of chastity (McMahon 31). Essentially, the rise of chastity culture, which adversely affected many women during the Ming dynasty, may be attributed to male insecurities.

According to the ancient legends, when a fox spirit seduces a man, she drains his life energy away, illustrating the consequences of succumbing to the seductive and alluring being. Yet, equating this legend to the rise of women in power is a misguided comparison. An ambitious woman cannot be likened to the malevolent nature of the fox spirit; men do not suffer simply because a woman is in power. This ties into a broader societal phenomenon: when marginalized groups strive for equality, those in power often feel threatened, perceiving the pursuit of justice as a personal attack. This has culminated in a culture where women often grapple with issues surrounding their self-worth, face undue competition, and endure pain, all to ensure that their male counterparts' egos are upheld. This not only serves as a detriment to the individual woman, but attacks the broad scope of female ambition, agency, and autonomy. The Ming dynasty's intense emphasis on heightened chastity and virtue in women serves as a prime example of how easily the male ego crumbles and scrambles to "protect" a perceived social order.

In the modern world, it is imperative to draw on historical narratives when analyzing our own societal issues, as the past may hold many lasting implications. While stories of the mischievous fox spirit may be folklore, the systemic undermining of women's power through the usage of manipulative narratives is a tangible reality. In our pursuit of true gender equality, we must dismantle age-old

myths and begin re-evaluating our societal values. Only then will it be possible to break the ceaseless cycles of history, thereby elevating women to their fullest potentials, no longer shackled down by the shadows of the past.

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VOTER REGULATIONS AND THE ARMY IN 1864

LIAM FOURNIER-BARTLETT



WRITER'S COMMENT: As a sophomore, I took History 180C: History of the Right to Vote in the United States with Professor Downs. The class educated me on the struggles within America to live up to the ideals of the nation. I slowly began to think about the idea of soldiers voting during the American Civil War, especially as the war focused on the identity of the nation. Taking the course UWP 102C: Writing in History provided me with the opportunity to research soldiers voting in the American Civil War. I originally hoped to look at the letters and diaries from soldiers expressing their sentiments about their vote in the field, but I later pivoted to look at the process of voting in the field with the assumption that the field voting was controlled by the federal government. I learned that is not the case. This essay demonstrates the power of state governments to control elections within Union Field camps and the role of generals as representatives of the federal government.

INSTRUCTOR'S COMMENT: In my UWP 102C: Writing in History class, students are given free rein to write on whatever historical topic they choose for our research project. Thinking of a viable topic can be a struggle for some, but others find an opportunity to work on something they've long held an interest in. This was the case for Liam, as he expressed interest in researching how American soldiers voted during the Civil War from the start of our course. What he ultimately produced is a fascinating and well researched paper looking specifically at two Virginian armies, the Army of Potomac and the Army of James, to showcase what voting was like for soldiers in the Federal

army. Liam skillfully argues that state election officials were able to influence and manipulate how soldiers voted on the front lines due to an overall lack of involvement by army officials leaving the voting process unprotected. As he points out, this research is important scholarship that's largely been overlooked, making his argument even more compelling.

- Jillian Azevedo, University Writing Program

In a letter to Edwin Stanton, Secretary of War, on the matter of soldiers voting in the election of 1864, Ulysses S. Grant, lieutenant general, wrote:

[Soldiers] are American Citizens, having still their homes and social and political ties, binding them to the States and Districts, from which they come, and to which they expect to return. They have left their homes temporarily, to sustain the cause of their country, in the hour of its trial. In performing this sacred duty, they should not be deprived of a most precious privilege. They have as much right to demand that their votes shall be counted, in the choice of their rulers, as those citizens, who remain at home; Nay more, for they have sacrificed more for their country.¹

Grant's letter represented the sentiment within the United States regarding allowing federal soldiers in the field to express their right to vote during the Civil War. The ability for soldiers at the front to vote in war time elections was a novel idea during this conflict. The idea faced implementation challenges on the methods to facilitate the ability for soldiers to vote.

Most scholarship has focused on the laws passed by state governments allowing soldiers to vote in the elections with little

¹ Ulysses S. Grant, Ulysses S. Grant to Edwin Stanton, September 27, 1864. In *The Papers of Ulysses S. Grant*, 12. Edited John Y. Simon. (Carbondale: Southern Illinois University Press, 1967). 212

regard to the role of army high command to facilitate the elections in the field. Soldiers were allowed to vote either at field camps, or through proxy or absentee ballots. The methods allowing soldiers to vote have been studied but not the implementation of those methods amongst Federal soldiers at the front. This paper studies the implementation for making soldiers vote in the election of 1864 and the involvement of high command in that process for the Federal Armies in Virginia. The largest Federal army in Virginia was the Army of Potomac and a smaller army was the Army of James. Military high command in the Army of the Potomac and the Army of James acted as neutral observers in field elections, thus allowing election commissioners from the states to take control of the voting process at the front lines.

State legislatures passed laws allowing for soldiers to vote by proxy or absentee ballots in the field, severely restricting the involvement of high command. The legislature of Minnesota passed the first law allowing for absentee ballots for soldiers in field camps during the election. A few other states passed laws modeled after Minnesota.² Absentee ballots were printed and organized by the state's political parties and sent to soldiers, removing involvement from high command to interfere with the elections. The only possible influence of high command with absentee ballots was the distribution of mail amongst soldiers. The War Department could favor giving absentee ballots to republican soldiers during the election and withhold ballots from democrats. Interference with absentee voting in field camps required high command to actively inspect the mail for ballots. The states still controlled the voting process through the printing and sending of the ballots to the field camps. Proxy voting was another method which severely restricted high command. The process entailed allowing a trusted individual within a soldier's home state to vote on behalf of the soldier in

² Oscar Osburn Winther, "THE SOLDIER VOTE IN THE ELECTION OF 1864," *New York History* 25, no. 4 (October 1944): 441.

the election.³ This process allowed soldiers individual control over choosing their proxy voter. Although the states passed the laws for proxy voting, neither they nor the War Department controlled the process. Absentee and proxy laws moved the voting process away from the control of the army high command in the field camps. However, some states chose to enfranchise soldiers to vote at the field camps allowing for army high command to possibly be involved with the election.

Some states passed laws organizing poll stations on the front lines under the control, in theory, of regimental officers. Wisconsin was the first state to pass such laws with *an act to enable the militia and volunteers of this state, when in the military service of the United States or of this state, to exercise the right of suffrage*.⁴ As the name implied it allowed soldiers to vote in elections during wartime; additionally, the act also defined the process for voting in army field camps. Section 3 of the act states “The vote shall be taken by companies. Three ranking officers in each company of infantry or cavalry or battery of artillery shall act as inspectors of elections held under the provisions of this act...the officer in highest rank, acting as inspector of election in such company, shall be chairman of the board of inspectors.”⁵ The act defined regimental commanders to regulate the voting process in field camps, instead of army high command. Most regiments during the Civil War were raised by individual states, thus more closely involved with state politics. Army high command, on the other hand, was under the control of the federal government and cared little for state politics. The

3 Donald Richard Deskins, Sherman C. Puckett and Hanes Jr. Walton, “The Civil War Election and the African American Soldier’s Vote, 1864” *The African American Electorate: A Statistical History*. (Thousand Oaks: Sage Publishing, 2012). 219

4 Winther, 441.

5 AN ACT to enable the militia and volunteers of this state, when in the military service of the United States or of this state, to exercise the right of suffrage, General Laws passed by the legislature of Wisconsin, Ch. 11 sec 3 (1862). 17

act designated regimental officers, not generals, to run the election, which turned out to differ from reality. Reality saw state commissioners sent to field camps to conduct the election.

The election commissioners controlled the voting process at the field camps in the Army of the Potomac, rather than the generals of high command. Despite the laws modeled after Wisconsin allowing for soldiers to vote in the field, states still sent civilian officials down to oversee the process of the election. William H. Seward, secretary of State, wrote the following to Lt. General Grant in a letter on October 26, 1864, "This note will be handed to you by Mr. Ransom Van Valkenburg, a reliable and trustworthy man, who comes to the army to aid in collecting the soldier's vote of the state of New York. Pray give him suitable facilities."⁶ Valkenburg aid in collecting the vote from soldiers in field camps suggested that generals lacked the ability to organize the election process. The states needed trusted officials to make sure the election ran smoothly, rather than trusting in the army. Political parties, by sending election officials to the camps, ensured that voters received their ballots, regardless of party affiliation. Officials were sometimes attacked by republican soldiers for handing out democratic ballots to soldiers.⁷ The ability for soldiers to harm election commissioners demonstrated the lack of involvement by high command. Generals failed to impose order upon their troops during the election, therefore soldiers could freely disrupt the election process based on their personal convictions. The attacks by soldiers upon election commissioners were not the norm, but an exception; however commissioners confronted other challenges to persuade soldiers to vote in the elections. Ironically, one challenge came from old laws passed by the state governments, now expanding enfranchisement.

6 Williams Henry, Seward. Williams Henry Seward to Ulysses S. Grant, October 26, 1864. In *The Papers of Ulysses S. Grant*, 12. Edited John Y. Simon. (Carbondale: Southern Illinois University Press, 1967) 465.

7 Jonathan White, *Emancipation, The Union Army, and the Reelection of Abraham Lincoln*. Baton Rouge: (Louisiana State University Press, 2014), 119.

An unintended challenge to getting soldiers to vote was lacking the qualifications required by state laws to vote. States required voters to meet certain qualifications to vote in elections during the 19th century. Soldiers meeting the voting qualifications proved to be a challenge, “one commissioner was perceived as ‘rather disgusted with the result of his mission’ because ‘very few of the soldiers had qualified themselves to vote and altogether appeared quite indifferent.’”⁸ The lack of qualifications to vote reflected the control of the state governments upon the election rather than the War Department. The qualification for soldiers to vote came from state laws passed before the Civil War to restrict voting. The restrictions came as a result of a massive wave of immigrants from Ireland and Germany. The legal restrictions included paying a poll tax to vote.⁹ The inability for Pennsylvanian troops to pay poll tax resulted in many being unable to vote in the field camps.¹⁰ A system designed by states to restrict voters in turn reduced the overall voter turnout amongst troops despite the new laws extending suffrage to them. The process of voting being so interwoven with the states through the poll tax blocked any chance of the high command to regulate the voting process within field camps. Soldiers requiring the approval of the states to vote in 1864 limited the role of generals within the election.

The result of the laws and presence of state election commissioners reduced generals, army high command, in the Army of the Potomac and the Army of James to being mediators and guides. The Army of the Potomac was under the direct command of General George Gordon Meade and his military staff. Both Meade and a staff member Colonel Theodore Lyman III recorded in letters a dispute about election fraud on election day, November 8, 1864. Lyman remarked on the dispute with a hostile tone towards election

⁸ Ibid, 113.

⁹ Alexander Keyssar, *The Right to Vote: The Contested History of Democracy in the United States* (New York: Basic Books, 2009), 41 & 67.

¹⁰ White, 112

commissioners, “Of course we might have known that this pack of political ‘commissioners’ could not get down here without a shindy of some sort. The point they brought up was fraudulent votes.”¹¹ Although hostile, Lyman demonstrates that army high command tried to function as problem solvers in disputes about the election. The state viewed the senior officers as tools to keep the ballot box “pure” rather than to enforce voting, therefore limiting their role to mediators. Meade’s letter showed high command acting as neutral investigators on election fraud:

To-day we have been examining the [reports of altered poll boxes], and there appears to be no doubt that poll books were brought here and distributed, having names of Republican electors misspelled and some omitted. The Democrats declare it is only a typographical error, and does not vitiate the use of the books, whereas the Republicans charge that it is a grave and studied effort to cheat the soldiers of their vote. In this dilemma I have applied to the Secretary of War, and asked for authority to send the parties either to Pennsylvania, to be tried by the courts there, or to Washington, to be disposed of by the Department...¹²

The investigation was done by the senior officers of the army, but the ultimate fate of the matter was beyond army jurisdiction. Instead, Meade made clear that Pennsylvania courts or the War Department determined the outcome of the fraudulent voting. Misspelled names were not the only problem faced by election commissioners, they struggled to find their voters in field camps. The election commissioners turned to generals to locate voters. In the Army of James, Major General Benjamin Butler informed commissioners on the location of their constituent

11 Theodore Lyman. Theodore Lyman to Elizabeth Russel Lyman, November 11, 1864. In *Meade's Headquarters, 1863-1865: Letters of Colonel Theodore Lyman from the Wilderness to Appomattox*. Edited George R. Agassiz. (Boston: Atlantic Monthly Press, 1922), 393-394.

12 George Gordon Meade. George Gordon Meade to Margaretta Sergeant Meade, November 9, 1864. In *the Life and Letters of George Gordon Meade, Major-General United States Army 2*. (New York: Charles Scribner's Sons 1913), 362.

voters.¹³ The usage of high command to help locate voters in field camps highlighted their role as neutral guides for state officials. Commanders knew their camps and regiments, which aided states in carrying out the voting process. States were in charge of controlling and carrying out the election, while high command acted as their guides and mediators in partisan debates.

As part of acting as a neutral observer, army high command was tasked with complying election results after polls closed. Grant received the results of the election within the Army of the Potomac from Meade a day after the election; he sent the results to Stanton noting total votes and Lincoln's majority.¹⁴ High command being a third party restricted their involvement in verifying the outcome of the election. Generals were trusted to determine the outcome, not the process. In a telegram to Grant, Meade expressed the following "The returns of the election were sent to you as received during the night-I am now preparing- a consolidated return showing the votes in each regiment by states, which when completed will be telegraphed."¹⁵ This telegram demonstrates the neutral nature of the high command in the election. The army only had the ability to share the outcome of the election and study regimental voting. The states conducted the actual election and allowed the army to validate the results.

An argument can be made that army high command, especially in the Army of the James, controlled the election process in field camps. However, generals were actually more concerned with winning than running the war, and accepted states running the election. On the day before the election General Benjamin Butler wrote to Stanton, Secretary of War, "I have done all I could

13 Williams Blair. *With Malice towards Some: Treason and Loyalty in the Civil War Era*. (Chapel Hill: The University of North Carolina Press, 2014), 228.

14 Ulysses S. Grant. Ulysses S. Grant to Edwin Stanton, November 9, 1864. In *The Papers of Ulysses S. Grant*, 12. Edited John Y. Simon. (Carbondale: Southern Illinois University Press, 1967) 395-396.

15 George Gordon Meade. George Gordon Meade to Ulysses S. Grant, November 9, 1864. In *The Papers of Ulysses S. Grant*, 12. Edited John Y. Simon. (Carbondale: Southern Illinois University Press, 1967), 396.

to prevent the secessionists from voting, and think [I] have had some effect. I think I may be able to punish some of the rascals for their crimes after [the] election.”¹⁶ The letter demonstrates that Butler actively sought to control the election, rather than allow the states to run it. Secessionists mentioned in the letter referred to peace democrats (McClellan voters) as the opposition to Lincoln in the election. Butler viewed voting against Lincoln as a crime. The punishment after the election included court-martials which resulted in an expulsion from the army. The fears of court-martials were tools used to stop peace democrats from voting in the field camps.¹⁷ On the other hand, to encourage voting some generals bought votes for Lincoln with promotions.¹⁸ Butler and generals like him were the exception. Butler, for instance, was a politically appointed general, therefore he was more likely to care about the outcome of the elections, whereas generals like Meade and Grant cared more about the fight. Grant demonstrates the norm towards voting with field camps, although he personally disliked the idea of civilian election commissioners being present in military camps¹⁹, he allowed the commissioners from the states to enter army camps. His willingness to comply with orders to have commissioners in field camps was expressed in a letter to Stanton, “My letter on the subject of appointing agents to superintend elections in the army only gave general views. Whatever order you make on the subject will be cheerfully carried out.”²⁰ The letter was written a month

16 Benjamin Franklin Butler. Benjamin Franklin Butler to Edwin McMaster Stanton, November 7, 1864. In *Private and Official Correspondence of Gen. Benjamin F Butler, During the Period of the Civil War 5*. (Springfield: Plimpton press, 1917), 799.

17 White, 213.

18 Blair, 228.

19 Ulysses S. Grant to Edwin Stanton, September 27, 1864. 213-214; Blair, 227.

20 Grant, Ulysses S. Ulysses S. Grant to Edwin Stanton, October 1-2, 1864. In *The Papers of Ulysses S. Grant, 12*. Edited John Y. Simon. (Carbondale: Southern Illinois University Press, 1967), 215.

before the election and displayed that the army high command chose to lack power in controlling the election. Grant, like the majority of generals, allowed the election process to be controlled from outside the army rather than within it.

The front-line elections within the Army of the Potomac and the army James were controlled by election commissioners from the states, thus reducing high command into a moderator. High command became the solver of disputes within the election process, despite the laws originally calling for officers to run the election. Fraudulent cases over voting became the only involvement for high command in the Army of the Potomac in the election of 1864. The states only trusted the generals to resolve issues from the election. States distrusted the army to run election voting and sent election commissioners as many states feared that Lincoln planned to use the troops for his own benefit. The states feared the creation of essentially a republican voting bloc, the army. The state election commissioners controlling of the elections helped assuage fears that democrats would not be able to vote at the front, thus the army would be a tool for the federal government. The state commissioners represented both political parties thus allowing democrats to receive their right to vote. Access to the ballot remained “pure” because generals mostly lacked power to stop voting against Lincoln. The role of high command as moderators reflected the lack of federal control of the voting process during the Civil War. Even members of a federally controlled branch were unable to step in and plan the elections. States not only passed the laws for the elections, but also carried out the voting process. The federal government bent to the will of the states for running the election. The lack of federal involvement in the voting process during the Civil War allowed states to enforce their restrictive practices for electorate participation. Camps controlled by army high command were unable to shake the restrictive practices blocking minorities from voting in elections during the 1800s.

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THE SECOND DEATH OF MR. KEYNES

ROBI CASTANEDA



WRITER'S COMMENT: No one really enjoys filing taxes or discussing fiscal policy, and if they do—needless to say, they're quite unique. Economics, finance, and taxes are often cast aside as a tedious matter, making writing this paper particularly challenging. As a student in Professor Scott Herring's UWP 121 class, this assignment tasked me with presenting an innovation in an unfamiliar science. In this case, economics—a rather tricky subject to pique people's interest in. My approach? To create a narrative; tell a story, and appeal to a general audience unfamiliar with the topic, much like a lawyer in court. As an aspiring lawyer, I've known that one of the good characteristics of any attorney is to turn the monotonous into a riveting, edge-of-your-seat experience. The facts of the case are thus: Keynesian economics died in 1970. But how? The DNA evidence is scattered throughout the fabric of American society. It's in our institutions, our welfare systems, and the money inside our wallets. The only question is—who is responsible?

INSTRUCTOR'S COMMENT: As a result of a happy series of accidents, I have the distinct pleasure of teaching a course in the University Honors Program every spring quarter. I look forward to it all year. When I taught my first Honors class, about a decade ago, a friend warned that the students "can be quite a handful." I suppose he was right, but not in the negative sense he meant. The Honors Program is like similar programs elsewhere, a kind of university-within-a-university for students willing to maintain the high level of performance such a program requires. Robi's winning essay was a product of the program, and of my Honors course, History of Scientific Writing. I was going to

try to summarize the content—the contrasting theories of John Maynard Keynes and Milton Friedman—but gave up, since I have never been good at that kind of thing. Doesn't matter: the essay was written in response to an assignment in which the students explain a difficult-to-understand innovation in a field of the writer's choosing, and write so that any member of the general public can figure it out. Robi did such a superlatively good job that you will find it makes perfect sense.

- Scott Herring, University Writing Program



Figure 1: Zimbabwe Trillion Dollar Banknote, Courtesy Smithsonian Institute

It was a warm October morning when I happened to come across something peculiar. There, in the cool breeze of the air-conditioned mall, just across from the rows of shopping carts and bustling shoppers, was a currency exhibit. But not just any currency—obsolete ones. Each bill told a story—each leader's face marked by a tale of success or failure. Upon the Soviet ruble was stamped the face of a stoic Lenin, unchanged despite the failure of his 70-year experiment. My eyes dashed towards a thin blue sheet, upon which were inscribed the words "Two Trillion Zimbabwean Dollars", an amount equatable to about 10 U.S. Cents. On the next table, is a 20 million dollar German mark—a hard lesson learned from a country indebted by wanton fiscal irresponsibility. Each bill was a lesson from a bygone era where governments knew little of the impacts of rapid fiscal expansion.

In Mexico, it is believed that a man suffers two deaths: one when he dies, and the second when the living forget his memory. John Maynard Keynes died on April 21, 1946, but it wasn't until 1973 that he suffered his second death. The longstanding economic theory of "Keynesianism" came crashing down, when, in the 1970s, a unique phenomenon known as "stagflation"—an increase in inflation and unemployment—was observed, conflicting Keynes' theories that had remained as the status quo for decades. John Maynard Keynes, known as the father of macroeconomics, proposed an economic model that emphasized government intervention in the economy. In contrast, modern-day approaches to economics, such as that proposed by Milton Friedman's neoliberal school, stress the importance of an uninterrupted market free from government impunity.

The Keynesian model's primary assertion was that there were no self-balancing mechanisms within a free market economy. Thus, the lack of self-adjusting mechanisms within a free market justified government intervention in the free economy. Among these interventions—a strong social safety net, and social security, would be the core of the Keynesian model. Keynes summarizes his argument in his work—*The General Theory of Employment and Money*, "The State will have to exercise a guiding influence on the propensity to consume partly through its scheme of taxation, partly by fixing the rate of interest, and partly, perhaps, in other ways" (Keynes 187). Keynes puts a special emphasis on the concept of "aggregate demand", that is, spending by the government, households, and businesses. Stimulating the demand for goods and services was the key to addressing unemployment. Keynes believed that it was the government's responsibility to create demand for products and that the market was unable to do so on its own. If this is a bit confusing, that's fine, because it honestly is!

To put it into simpler terms, let's say a candy shop in the middle of nowhere is about to go out of business, as it only sees most of its income from a group of kids that come by on a school bus twice a week. Lately, the kids on the bus haven't received much allowance from their parents, and in turn, the candy shop can't keep up with the expenses related to its upkeep and rent. Lo and behold, a man named Uncle Sam arrives and gives each kid on the school bus 20 dollars to spend, and to the candy shop—a small loan of 5000 dollars. Now the kids are happy and have money to satisfy their diabetic, sugar-induced needs, and the candy shop has both customers and the funds required to keep it afloat. Now everyone's happy!

This is precisely what happened during FDR's Green New Deal. A classic example of Keynesian Economics in action, Roosevelt's economic plan saw an influx of government spending to stabilize the effects of the Great Depression throughout the 1930s. The creation of government agencies for employment and subsidies to inject money into the economy was Roosevelt's way of "keeping the economy on life support" during the Great Depression. The Great Depression was defined by massive unemployment and the presence of "Hoovervilles"—shantytowns of the unhoused aptly named after President Hoover, the man blamed for the depression due to his decision to avoid direct government involvement in the economy. While Hoover may have waited for the economy to "self-adjust", it became clear that laissez-faire policies would take too long, and it was time for the government to step in. Economists Harold Cole and Lee Ohanian from UCLA describe the most notable of Roosevelt's policies to combat homelessness in America, "There were two policy phases during the New Deal. The first phase was the (National Industrial Recovery Act) NIRA (1933–35). The NIRA created rents by limiting competition and allowed labor to capture some of those rents by exempting industry from antitrust prosecution if the industry immediately raised wages" (Cole and Ohanian 5).

Just as much as Keynes had solutions for economic recessions, he also had solutions for periods of inflation. In *The General Theory of Employment and Money*, he writes, "If fiscal policy is used as a deliberate instrument for the more equal distribution of incomes, its effect in increasing the propensity to consume is, of course, all the greater" (Keynes 51). Keynes was a proponent of largely short-term solutions to economic issues. His famous quote from *A Tract on Monetary Reform*, lends

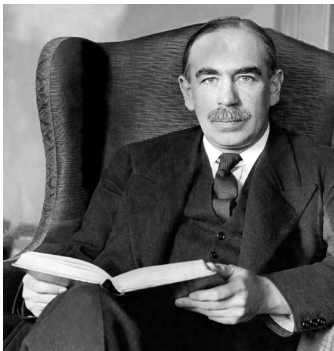


Figure 2: John Maynard Keynes, Courtesy of the BBC

credence to this statement, "(The) Long run is a misleading guide to current affairs, In the long run, we're all dead" (Keynes 1923). As such, Keynes came under heavy criticism from later economists for emphasizing the government as the long-term panacea to a nation's economic woes. Long after he died in 1946, Keynes soon found himself on the verge of his second death—the death of Keynesianism as the status quo for the global economy.

In his quotation of Austrian consultant, Peter Drucker, Chris Edwards, a fellow and economist of the Cato Institute, remarks, “Politicians in the 20th century had been “hypnotized by government ... in love with it and saw no limits to its abilities” (Edwards 2017). The Keynesian economy worked on a single axis—a rise in inflation could be resolved by increasing interest rates and government spending would similarly slow the inflation. Keynes’ assertions saw government spending, and fiscal expansion as the solution to inflationary woes. Argentina was among the list of many nations to discover that rapid government spending wasn’t the end all to stimulating economic growth.

1980s Argentina, faced with mounting debts, decided to print more money to address the debt it incurred from frequent government spending. This led to massive hyperinflation, which, at its peak in 1989, reached almost 3,000%—correlating to a 20% decline in GDP per capita between 1980-1989, massive unemployment, and a nearly 50% income poverty rate (Fudge). This, however, is no new story. Just after the end of the First World War, Germany found itself unable to pay the debt of its war reparations. Seeking relief by mass printing its currency to keep up with the demand, the struggling nation soon found itself struck by crippling inflation which, at its worst, kept the exchange at almost 1 trillion German Marks to a dollar. In the 2000s Zimbabwe followed a similar hyperinflationary spiral with the government printing money as an attempt to quell its budget deficits.

A Shift in Economic Thinking

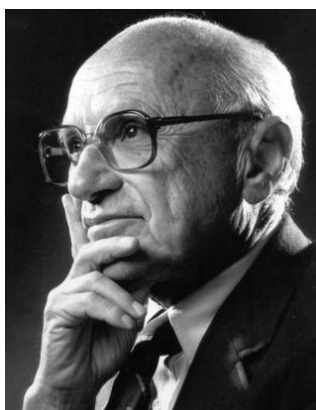


Figure 3: Milton Friedman Headshot, Courtesy of the Hoover Institution

Milton Friedman, a young, fledgling economist from the Chicago School, stepped out of the shadows to become, seemingly, the economic “hero” of the 70s, and the dominant force for neoliberal economic theory in the 1980s. Friedman pioneered the school of monetarism, which believed that controlling the money supply, not government spending and intervention (fiscal policy), was the key to reducing rapid inflation. In his famous work, *A Monetary History of the United States*, Friedman recalls the flaws of the Keynesian system, “The apparent failure of monetary policy to

relegation of money to a minor role in affecting the course of economic events” (Friedman 1963). In his critique of Keynesian economics, Friedman highlighted that Keynes neglected to recognize the impact of monetary policy in influencing economic affairs. In short, Friedman predicted that Keynes’ theory had limits—a theory that would later be proven true just 10 years after the publication of *A Monetary History of the United States*. In 1973, the onset of the Arab-Israeli War caused OPEC (The Organization of Petroleum Exporting Countries) to impose an embargo on the United States for its support of Israel in the war. This embargo caused subsequent inflation coupled with high unemployment, leading to an economic dilemma that proved the Keynesian model unable to account for strange phenomena. The government increased public spending and reduced taxes, yet the inflation rate remained. This contradicted the commonly held conceptions of the relationship between inflation and employment. Thus, the presence of low employment was thought to bring lower inflation (lower prices), however, the phenomenon of stagflation saw lower levels of employment coupled with rising prices. Friedman argued that “Inflation is always and everywhere, a monetary phenomenon” (Friedman 1991). Friedman’s influence eventually propelled the way for the involvement of monetary policy in the United States government. The results of this focus on monetary policy were noted by Michael Bryan of the Federal Reserve Bank of Atlanta, “Over time, greater control of reserve and money growth, while less than perfect, produced a desired slowing in inflation.” (Bryan 2013).

The impacts of Friedman’s philosophy had more far-reaching implications, however. With a huge emphasis on the free market being the key to good governance and democracy, Friedman’s philosophy spread to other parts of the world, propelled by, what some might say, proliferation by immoral means. Friedman’s predominant belief was that a free market was the prerequisite for a democratic society and not vice versa. Friedman writes in “Capitalism and Freedom”, “Economic arrangements play a dual role in the promotion of a free society.... Economic freedom is also an indispensable means toward the achievement of political freedom” (Friedman 1962). Such was the rationale by which Friedman began his support for anti-Keynesian regimes in Latin America. While Friedman advocated for monetary policy as a long-term solution to inflation, his doctrine also included radical privatization of government industries and

a return to the laissez-faire “hands-free” economic approach.

Friedman remains controversial due to his support for the Pinochet Regime in 1975. The University of Chicago’s School of Economics became the hotbed for his new economic theory and soon spread through an exchange program with local Universities in Chile. Here, Friedman laid the groundwork for his economic experiment, recruiting young Chilean students to study Friedman’s doctrine of non-government intervention. One of the setbacks of economics as a “science” is that novel experiments cannot be done without first having the risk of catastrophic consequences for non-consenting individuals. Unlike a chemistry experiment, which may be contained in the walls of a beaker in a laboratory, the effects of economic experimentation know no bounds. This phenomenon, described by Naomi Klein in her book, *The Shock Doctrine*, as, “(Chile’s) strong social safety net, its protections for national industry, its trade barriers, its controls on prices. Students were taught disdain for these attempts to alleviate poverty,” (Klein 2007). Pinochet introduced economic reforms that stripped Chile’s underbelly of the necessary social safety nets they depended on. Privatization was the norm. Pension systems, education, health, and labor, were privatized. The state had let go of the economy’s hand, and as a result, the economy was struck by an oncoming truck in the street. According to Klein’s analysis, by 1982, the implementation of Friedman’s policies in Chile resulted in 30 percent unemployment, and hyperinflation all spurred by financial houses, free from regulation, racking up all the country’s assets and gathering enormous amounts of debt (Klein 2006).

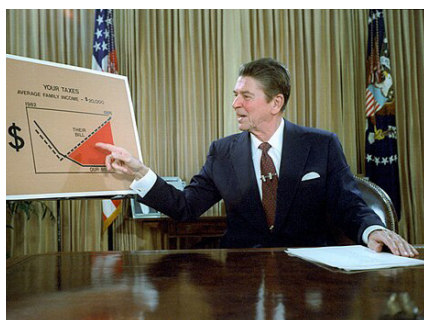


Figure 4: President Reagan outlining his plans for tax reductions (1981), Courtesy of the White House Photographic Archive

The influence of Friedman’s policies was felt just as much in the United States as it was in Chile, if not more so. President Reagan’s Economic Recovery and Tax Act of 1981 marked the beginning of “Reaganomics”. Reagan’s Tax Act of 1981 was a classic take out of Friedman’s playbook—privatization, tax-cuts, and minimal government intervention. Reagan’s policies espoused the principle of “trickle-

down economics”— tax cuts and the reduction of business regulations to favor large corporations. Supporters praise Reagan for his ingenious “trickle-down” approach. Critics say Reagan waits in hell for heaven to trickle down. One of the largest tax cuts in American history was coupled with a slash in government support for welfare services. Reagan’s theory supposed that tax cuts for businesses would stimulate economic growth. Then, the benefits of the upper class could simply “trickle down” to benefit the common middle-class American through an increase in jobs. Yet, the truth shows that the benefits failed to trickle down to the lowest rung of the economic ladder. Brick by brick, tax cut by tax cut, slash after slash in welfare funds, the old Keynesian order established during the New Deal came crashing down. Many of the tax cuts of the Reagan era came at the cost of reducing government services that benefitted the Americans at the bottom of the economic pyramid. In her analysis of the welfare state under Reagan, Mimi Abramovitz, a professor at the City University of New York, writes, “the share of national income going to wages fell from a high of 66.3% (1970) to a low of 49.6% (2011)”, “In contrast to falling rates during the post-war period, poverty jumped from a low of 11.1% (1973) to a high of 15.2% (1983)” (Abramovitz 2014). Abramovitz further writes that cuts to the federal education programs meant generations of low-income Americans, primarily from disenfranchised minorities, would struggle even more to attain financial and educational resources to take them up the economic ladder.

It is the nature of any revolution to replace the preceding system that came before it. Keynes, Friedman, whoever it may be, each man’s ideas fit their respective times, each one with its own needs. A patient might be intubated during a short visit to the hospital, but staying hospitalized for the rest of his life, even when he doesn’t need to, is certainly not the solution most doctors would jump to. Likewise, Keynes’ ideas fit best as a short-term solution. Its implementation into the New Deal to the Great Depression that crippled America for most of the 1930s. But after the post-war recovery jumpstarted the nation back into action, the need for constant government involvement waned. On the other extreme, Friedman’s policy of monetary control may have solved the 1970s stagflation dilemma, but his doctrine of rapid privatization led to disastrous consequences for South America’s southern cone. It is easy to reduce oneself to the extreme of choosing Keynes vs. Friedman, but a more practical analysis concludes that both still have a place in the 21st

century. While Friedman is alive and well in the global economy, Keynes might well still be able to recover from his second death.



Figure 5: German Papiermark of the Weimar Republic, Courtesy of the Reichsbankdirektorium Berlin

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ENDING THE WAR ON DRUGS

ANDREA NICOLAU



WRITER'S COMMENT: Though initially daunting, fulfilling my university writing requirement under the guidance of Professor and distinguished author Sasha Abramsky proved to be beyond fulfilling and a pleasure. To conclude our Social Justice Writing Class, Professor Abramsky tasked his students with a think tank report on an issue of our choice, involving both macro data and personal interviews. The consequences of the War on Drugs remain entirely overlooked by the nation. The suffering endured by millions of currently and formerly incarcerated individuals affected by the drug war stems from the deliberate political decisions by the United States government to prosecute and oppress marginalized populations. Decades of spewing false narratives surrounding drug users and drug abuse have not only fueled mass incarceration, they have effectively brainwashed Americans to tolerate, and often support, the stigmatization and dehumanization inherent in drug war propaganda. As I insist upon the necessary measures to address this problem, my report also hopes to contribute to and encourage the ongoing discussion and condemnation of the harms caused by the War on Drugs.

INSTRUCTOR'S COMMENT: Andrea Nicolau's reportage-based essay Ending the War on Drugs was the centerpiece of her Quarter's work in the social justice writing class that I teach in the University Writing Program. The project was extraordinarily thoroughly researched, covered both the history of the war on drugs and also how its long tail still impacts society today, and also profiled three people who had been incarcerated as a result of drug convictions. There was, in her

writing, both the confidence born of thorough research and mastery of her topic, and also a powerful thread of empathy for those caught up in the war on drugs. It was an extremely impressive intellectual feat and showcased Andrea's talents as both a researcher and a narrative non-fiction writer. I am delighted that Prized Writing is publishing this essay, and I am sure that Andrea will flourish as a writer in the years to come.

- Sasha Abramsky, University Writing Program

Introduction

The failed War on Drugs in the United States has undeniable and lasting repercussions on society. This report begins by delving into the punitive policies that fueled the emergence and early expansion of the drug war in the United States. Moreover, with a particular focus on California, it exposes the consequences of the drug war's deliberate and disproportional targeting of minority groups since the 1970s, along with its role in exacerbating mass incarceration. By amplifying the voices of formerly incarcerated individuals affected, a drastic shift in the national rhetoric as well as the adoption of a harm reduction approach is necessary in attempting to tackle the devastation wrought by the War on Drugs.

Emergence of the War on Drugs: Nixon's Era

In 1969, former President Richard Nixon addressed the public's fear of a growing drug epidemic in the United States as heroin use surged among Vietnam War veterans. The next year, Nixon passed the deeply flawed Controlled Substances Act, which categorized drugs into five "schedules" based on the government's notion of potential risks of abuse and medical use.

This still serves as the dominant framework in the criminalization and dehumanization of users.¹

In 1971, Nixon formally declared the infamous “War on Drugs,” emphasizing drug addiction as a “national emergency” and labeling abuse as “public enemy number one.”² Nixon believed that restrictive and punitive policies would lead to a “drug-free” nation.³ The 1973 establishment of the Drug Enforcement Administration (DEA) was part of the multi-billion dollar national effort to criminalize drug use and smuggling.⁴ Minimum mandatory sentences reversed progress, and further punitive measures resulted in severe sentences for drug offenders.⁵

Expansion of the War on Drugs

From the early 1980s to the early 2000s, the government amplified the aggressive criminalization and punishment of the War on Drugs, permeating the media and society. Nancy Reagan’s “Just Say No” campaign was representative of the early ongoing effort to morph public opinion toward the false belief that drug abuse was an individual, moral failure. Further misconceptions arose as minority groups were disproportionately targeted for drug

1 Crandall, Russell. “Reagan’s War.” *Drugs and Thugs: The History and Future of America’s War on Drugs*, Yale University Press, 2020, pp. 153–72. JSTOR, <https://doi.org/10.2307/j.ctv177tk3n.14>.

2 “America’s War on Drugs - 50 Years Later.” The Leadership Conference on Civil and Human Rights, 29 June 2021, civilrights.org/blog/americas-war-on-drugs-50-years-later/.

3 The Global Commission On Drug Policy, *War on Drugs*, https://www.globalcommissionondrugs.org/wp-content/uploads/2017/10/GCDP_WaronDrugs_EN.pdf.

4 “America’s War on Drugs - 50 Years Later.” The Leadership Conference on Civil and Human Rights, 29 June 2021, civilrights.org/blog/americas-war-on-drugs-50-years-later/.

5 Weaver Jr., Warren. “Nixon’s Justice.” *The New York Times*, 18 Mar. 1973, www.nytimes.com/1973/03/18/archives/strong-medicine-indeed-nixons-justice.html.

crimes, and as the dangers and addictive risks of drugs such as crack cocaine became a media frenzy. The latter effectively rendered people of color responsible for the problem, and its hysteria and paranoia justified the continued criminalization of users.⁶

Billions of dollars⁷ were devoted to policing through massive arrests, street sweep tactics, SWAT teams, and mass incarceration, with few resources dedicated to treatment and research.⁸ Moreover, anti-drug policies such as the National Drug Control Policy and the discriminatory Anti-Drug Abuse Act of 1988 were established.⁹

The policies that drove the drug war ultimately stemmed from rhetoric about users perpetuated by the government, to not only enforce criminalization but to establish the notion of the enemy; the undesirables, or rather, minority communities. In that way, the government could justify its tough-on-crime policies to control and disempower them.¹⁰

The War on Drugs is a War on Marginalized Communities

The War on Drugs' effects on correctional systems and prisons are astounding, especially for low-income people of

6 Crandall, Russell. "Reagan's War." *Drugs and Thugs: The History and Future of America's War on Drugs*, Yale University Press, 2020, pp. 153–72. JSTOR, <https://doi.org/10.2307/j.ctv177tk3n.14>.

7 Bush, George W. "President Bush Announces Drug Control Strategy." U.S. Department of State, 12 Feb. 2002, state.gov/p/inl/rls/rm/8451.html.

8 National Drug Control Strategy, and The White House. *Progress in the War on Drugs 1989 - 1992*, National Drug Control Strategy, Jan. 1993, www.ojp.gov/pdffiles1/ondcp/140556.pdf.

9 Crandall, Russell. "Reagan's War." *Drugs and Thugs: The History and Future of America's War on Drugs*, Yale University Press, 2020, pp. 153–72. JSTOR, <https://doi.org/10.2307/j.ctv177tk3n.14>.

10 Delaney, Ruth, et al. "American History, Race, and Prison." Vera Institute of Justice, www.vera.org/reimagining-prison-web-report/american-history-race-and-prison.

color.¹¹ Incarceration rates rose by a drastic fourfold in the United States from 1970 to 2010. Between 1980 and 1999, California's prison population grew by 600%, and its incarcerated drug offender population grew by more than 2400%.¹² From 1977 to 2000, California's prison population increased by over a hundred thousand. By 2000, California was the leading state to imprison drug offenders.¹³

Anti-drug efforts targeted low-income minority groups. The policing of drug offenders was especially prevalent for minorities, especially black Americans in impoverished inner-city neighborhoods despite illicit drug use being more likely among white Americans.¹⁴ Regardless, African American and Latino populations made up an astronomical 64% of the prison population despite comprising a minority of the general population. African Americans accounted for 7% of the California population yet filled 31% of its prison population.¹⁵

11 Drug Use and Justice: Drug Use and Justice: Drug Use and Justice: An Examination of California An Examination of California Drug Policy Enforcement, Justice Policy Institute, Oct. 2000, static.prisonpolicy.org/scans/cjcj/cadrug_w.pdf.

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15 Murch, Donna. *Crack in Los Angeles: Crisis, Militarization, and Black Response to The ...*, June 2015, diversity.williams.edu/davis-center/files/2015/05/Crack-in-Los-Angeles-Crisis-Militarization-and-Black-Response-to-the-Late-Twentieth-Century-War-on-Drugs.pdf.

Unraveling the Consequences of the Drug War

Since 2010, incarceration rates have modestly decreased. In 2021, incarceration rates hit their lowest levels since 1995.¹⁶ By 2020, the number of individuals in state or federal prisons had decreased by 25% since 2009, the year with the highest recorded prison population. Moreover, from 2000 to 2014, racially motivated incarceration rates appeared to reverse, with African Americans being released faster than white individuals. Between 2006 and 2013, new incarcerations for African Americans decreased by 25% and decreased by 33% for Latinos.¹⁷

California consequently followed suit. In response to overcrowding and injustice, legislative efforts such as Proposition 36 in 2000 and Proposition 47 in 2014 aimed to reduce incarceration sentences for nonviolent drug offenses¹⁸ and to reclassify certain drug offenses from felonies to misdemeanors¹⁹, emphasizing a shift towards rehabilitation over punishment.

Moreover, legislative efforts since 1996 in California led to the recreational legalization of marijuana in 2016, with 23 states following suit. This marks a significant step in dismantling the drug war, considering that marijuana-related arrests surpassed other drug-related arrests since 1996, disproportionately affecting people of color and low-income populations.²⁰

16 Gramlich, John. "America's Incarceration Rate Falls to Lowest Level since 1995." Pew Research Center, 16 Aug. 2021, www.pewresearch.org/short-reads/2021/08/16/americas-incarceration-rate-lowest-since-1995/.

17 Crandall, Russell. "Reagan's War." *Drugs and Thugs: The History and Future of America's War on Drugs*, Yale University Press, 2020, pp. 153–72. JSTOR, <https://doi.org/10.2307/j.ctv177tk3n.14>.

18 "Proposition 36." Proposition 36_Drug Treatment Diversion Program, lao.ca.gov/ballot/2000/36_11_2000.html.

19 "Program Profile: The Impact of California's Proposition 47 (the Reduced Penalties for Some Crimes Initiative) on Recidivism." CrimeSolutions, National Institute of Justice, 29 Nov. 2021, crimesolutions.ojp.gov/ratedprograms/740#pd.

20 Drugs and Crime Facts - Bureau of Justice Statistics, U.S. Department of

Personal Testimonies: The Human Toll of the War on Drugs

David Henderson

David Henderson (not his real name) is a recovered substance user and clinical social worker in Los Angeles. David's turning point toward sobriety occurred in 2008 after his arrest for driving under the influence served as a wake-up call, pushing him toward his ongoing nine-year journey of sobriety and his career as a therapist.

Despite feeling extremely rewarded in his current profession, he acknowledges the privilege and resources accessible to most of his clients, who are educated and well-established in their careers. Regardless of privilege, he notes that mental health issues often co-occur with addiction among the people he treats. He similarly reflects, sharing experiences of anxiety and low self-esteem during his teenage years which fueled his struggles with substance abuse.

He describes court-mandated rehabilitation as a “means to an end,” as is incarceration, serving only as a temporary more attractive option, adding that addicted people often revert to abuse once their mandate is up.

While Henderson expresses gratitude for his welcoming and supportive community and Alcoholics Anonymous in his recovery process, he faced challenges and felt stigmatized during his struggle, remembering the damage it caused in his relationships with family and friends. He recognizes his circumstances would have been different if not for the critical role of access to quality therapy and resources as well as a supportive community.²¹

Justice, bjs.ojp.gov/content/pub/pdf/dcf.pdf.

²¹ Henderson, David. Interview. Conducted by Andrea Nicolau. 5 November 2023.

Zachary Psick

Zachary Psick, a formerly incarcerated individual who is now a lecturer at UC Davis and a vocal advocate against the criminal justice system, urges the abolition of criminology in his sociology classes and condemns the system as a means to label and control undesirable populations.

Comparing incarceration to a dog's first panicked reaction on a leash, he says it's unnatural behavior, traumatizing, and inhumane. Psick chokes up, making it clear that the criminal justice system is "anything but just" and "neglects the people most harmed."

Zachary highlights the damaging effects of the War on Drugs, particularly in how it unjustly equates his less serious nonviolent drug offenses with his more concerning violent felonies, emphasizing how we dehumanize and criminalize suffering populations.

He reflects on his time incarcerated, attributing it to the environment he grew up in in Northern Minnesota, which was fraught with poverty, violence, addiction, and worse. Having cycled in and out of jail from 13 to 21, with convictions for eight violent and nonviolent drug-related felonies, he shares how using, particularly marijuana, gave him joy for the first time in his life. Angry, he firmly believes that his life would have been different if the government had made different choices.

Despite facing barriers such as difficulty in securing housing in Davis, CA, and leaving behind a dream of becoming a lawyer, he has built a life he values. He co-founded the Underground Scholars Initiative to support formerly incarcerated students and plans to invest in real estate to provide affordable housing for others like him.

While he escaped his environment, he laments his family and friends' lives, many of whom remain addicted, incarcerated, or in poverty.²²

22 Psick, Zachary. Interview. Conducted by Andrea Nicolau. 31 October 2023.

Gabriel Johnson

Gabriel Johnson survived off welfare as a child and followed his parent's footsteps in a life met with crime and addiction. At age 13, his dad's dead body was thrown in the dumpster after a heroin overdose because his family feared prosecution. After that, he says "I wasn't a good kid." He resorted to drinking, smoking, taking acid, and began abusing pain pills.

In 2009, in downtown Sacramento, CA, cops busted down his door. With a prior felony conviction he had received at 17, he was sentenced to 13 years in prison for the possession of fentanyl, oxycontin and marijuana. Johnson says the system did everything to punish him further, tacking on charges of intent to distribute because he shared the drugs with a friend.

Johnson's release from Folsom State Prison came nine years early as he had been searched without probable cause. He searched and searched, but "the only job open to ex-convicts is construction." If not for his mother's couch to sleep on, he would have been homeless. He eventually studied at American River College and Humboldt University and now expects his long-awaited admission to the bar as a criminal lawyer.

"I am the exception," he says. "People in prison don't usually come out with the determination to do better." The system traps people, depresses them. "No wonder" drugs were easier to access in prison than outside.

For Gabriel, the War on Drugs is a war on "families, their kids, loved ones." "For every father you lock up for drugs, you get another depressed, fatherless child."²³

²³ Johnson, Gabriel. Interview. Conducted by Andrea Nicolau. 16 November 2023.

Failures of the Drug War

The attempt to eliminate drug supply through incarceration and deterrence has proven counterproductive. Global production of illegal drugs has persisted, with their use reaching a peak in 2019 not seen in forty years.²⁴ The drug war has ultimately failed in its goal while also creating greater overall harm by marginalizing populations.²⁵

The drug war's restrictions prevent the safe regulation and distribution of substances, particularly opioids in recent years, which have contributed to a tragic increase in deaths. Between 2000 and 2014, overdose deaths devastatingly skyrocketed. During the pandemic, they jagged upwards again. All told, from 2019 to 2021, the number of overdose deaths increased by 58%. From 1999 to 2021, the number of lives lost to drug overdose increased by a startling 781%.²⁶

Moreover, policing and incarceration do not reduce drug harms and instead create further harm. Incessant and forcible prosecution of drug offenders is an evident form of suffering inflicted upon individuals and society. It does not improve safety, save lives, or encourage recovery from addiction.²⁷ The irony of the presence of drugs within prisons and jails devastatingly demonstrates itself as

24 Lee, Juhohn. "America Has Spent over a Trillion Dollars Fighting the War on Drugs. 50 Years Later, Drug Use in the U.S. Is Climbing Again." CNBC, 17 June 2021, www.cnbc.com/2021/06/17/the-us-has-spent-over-a-trillion-dollars-fighting-war-on-drugs.html.

25 Nadelmann, Ethan. "Drugs." *Foreign Policy*, no. 162, 2007, pp. 24–30. JSTOR, <http://www.jstor.org/stable/25462207>.

26 Drug Overdoses - Data Details." *Injury Facts*, 13 Mar. 2023, injuryfacts.nsc.org/home-and-community/safety-topics/drugoverdoses/data-details/#:~:text=In%202021%2C%2098%2C%2068%20people%20died,%2C%20homicide%2C%20and%20undetermined%20intentions.

27 Hassan, Adeel. "Prisoners Today, Neighbors Tomorrow." *The New York Times*, 25 Mar. 2023, www.nytimes.com/2023/03/25/us/prisons-rehabilitation-san-quentin.html#:~:text=As%20of%202022%2C%20according%20to,in%20military%20prisons%2C%20civil%20commitment.

death from drug overdoses from 2001 to 2018 increased by more than 600%. Nevertheless, adequate treatment is not provided.²⁸

Consequent efforts to reduce sentencing and release drug offenders in the country with the world's highest incarceration rate, however, do not address the systemic challenges faced by the formerly incarcerated population. The annual release of 600,000 people remains arduous, with criminal records limiting access to housing, employment, and mental health resources.²⁹ Upon release, they are ten times more likely to experience homelessness than the general population.³⁰ Their unemployment rate stands at 27%, with jobs often providing unlivable wages. Formerly incarcerated people also face heightened risks of overdose, suicide, addiction, and mental health issues.³¹

Most rely on support from family and friends. Dulce Drysdale, incarcerated for cocaine possession, notes she depended on friends for housing and "finding a job was impossible."³² Beth Phillips, on three years' probation for possessing illicit substances, similarly struggled to find work.

28 Schwartzapfel, Beth, and Jimmy Jenkins. "Inside the Nation's Overdose Crisis in Prisons and Jails." The Marshall Project, www.themarshallproject.org/2021/07/15/inside-the-nation-s-overdose-crisis-in-prisons-and-jails.

29 Hassan, Adeel. "Prisoners Today, Neighbors Tomorrow." The New York Times, 25 Mar. 2023, www.nytimes.com/2023/03/25/us/prisons-rehabilitation-san-quentin.html#:~:text=As%20of%202022%2C%20according%20to,in%20military%20prisons%2C%20civil%20commitment.

30 Couloute, Lucius. "Nowhere to Go: Homelessness among Formerly Incarcerated People." Prison Policy Initiative, Aug. 2018, www.prisonpolicy.org/reports/housing.html.

31 Kopf, Lucius Couloute and Dan. "Out of Prison & Out of Work: Unemployment among Formerly Incarcerated People." Out of Prison & Out of Work | Prison Policy Initiative, 2018, www.prisonpolicy.org/reports/outofwork.html.

32 Drysdale, Dulce. Interview. Conducted by Andrea Nicolau. 17 November 2023.

Without her mother's support in providing her housing and transportation, she says she would have likely returned to prison.³³

Shifting the National Rhetoric

The drug war fails to understand the underlying causes of substance use and abuse in the United States, which are rooted in our social reality.

The system refuses to acknowledge the suffering it creates; the gap between the poor and rich, the lack of affordable low-income housing, and the inaccessibility and unaffordability of health care. Even the affluent and educated experience high levels of stress and alienation. People from all walks of life use as a coping mechanism or sell drugs to survive.

The system also overlooks the non-harmful nature of substance use, which can be therapeutic and healing for many, whether it be social, spiritual, or medicinal. Millions of Americans and large numbers of scientific studies have shown that recreational and medicinal marijuana use can be beneficial and medicinal.³⁴ Keith, a small business owner in Davis, California, advocates strongly for the federal unscheduling of marijuana as he personally witnessed the miraculous effect of Cannabidiol (CBD) on a child with epilepsy during his involvement with the Harborside marijuana industry.³⁵ Moreover, the use of psychoactive plants play a significant role in mental health, especially for Indigenous people.³⁶ Eric Zuniga from Martinez, California praises ayahuasca, psilocybin, and

33 Phillips, Beth. Interview. Conducted by Andrea Nicolau. 21 November 2023.

34 Nadelmann, Ethan. "Drugs." *Foreign Policy*, no. 162, 2007, pp. 24–30. JSTOR, <http://www.jstor.org/stable/25462207>.

35 Keith. Interview. Conducted by Andrea Nicolau. 3 November 2023.

36 Bouso, José Carlos, and Constanza Sánchez-Avilés. "Traditional Healing Practices Involving Psychoactive Plants and the Global Mental Health Agenda: Opportunities, Pitfalls, and Challenges in the 'Right to Science' Framework." *Health and Human Rights*, vol. 22, no. 1, 2020, pp. 145–50. JSTOR, <https://www.jstor.org/stable/26923481>.

marijuana as crucial to healing his trauma. Being indigenous, he feels the government “infringes” on his access to and practice of indigenous culture. “Society does not support the degree of healing I need,” he says.³⁷

The drug war’s anti-drug rhetoric propaganda has created and contributed to the widely held stigmatized perception of illicit drug use and addiction. It has defined addiction as a moral choice, one that can be prevented by “just saying no.” Addiction, rather, as previously implied, is a symptom of our society; a response to unresolved trauma, to suffering. Framing addiction as an individual problem as opposed to a social problem alienates, shames, and dehumanizes a suffering population; it creates misconstrued and harmful narratives associated with addicts, affecting them on a social level in addition to a systemic level. Beth Phillips was seen as the “scum of the earth” once she lost her “stable soccer mom life” to drug addiction. “People don’t understand addiction. I would never choose this.”³⁸

If we begin to shift the national rhetoric surrounding drug use, we can begin to shift policies to be more flexible in addressing drug harms and preventing further ones.

It’s important to recognize the need for a more nuanced approach beyond mere legalization, as there is not one single solution to addressing the drug problem. The “harm reduction” approach acknowledges the inevitability of drug use and abuse while aiming to mitigate associated harms. In the words of Mark Kleiman, a renowned public policy scholar and educator at UCLA, “We should act only when we can do more good than harm, not merely to express our righteousness.”³⁹

37 Zuniga, Eric. Interview. Conducted by Andrea Nicolau. 7 November 2023.

38 Phillips, Beth. Interview. Conducted by Andrea Nicolau. 21 November 2023.

39 Crandall, Russell. “Reagan’s War.” *Drugs and Thugs: The History and Future of America’s War on Drugs*, Yale University Press, 2020, pp. 153–72. JSTOR, <https://doi.org/10.2307/j.ctv177tk3n.14>.

As a result of the legalization and harm reduction approach toward tobacco and alcohol, their use has been normalized, and thus is higher than any other substance, while still significantly contributing to health issues and high mortality rates.⁴⁰ Reducing their harms can be seen in promoting responsible drinking and discouragement of smoking or use of alternatives, for example. If similar harm reduction approaches were applied to criminalized drugs⁴¹, such as establishing overdose prevention centers proven to prevent fatalities and disease transmission or expanding access to methadone for treating opioid-related addictions⁴², it would acknowledge the reality that their use and abuse would persist regardless of legalization, which would reduce associated harms rather than exacerbate them.⁴³

40 Crandall, Russell. "Reagan's War." *Drugs and Thugs: The History and Future of America's War on Drugs*, Yale University Press, 2020, pp. 153–72. JSTOR, <https://doi.org/10.2307/j.ctv177tk3n.14>.

41 Crandall, Russell. "Reagan's War." *Drugs and Thugs: The History and Future of America's War on Drugs*, Yale University Press, 2020, pp. 153–72. JSTOR, <https://doi.org/10.2307/j.ctv177tk3n.14>.

42 Nadelmann, Ethan. "Drugs." *Foreign Policy*, no. 162, 2007, pp. 24–30. JSTOR, <http://www.jstor.org/stable/25462207>.

43 Crandall, Russell. "Reagan's War." *Drugs and Thugs: The History and Future of America's War on Drugs*, Yale University Press, 2020, pp. 153–72. JSTOR, <https://doi.org/10.2307/j.ctv177tk3n.14>.

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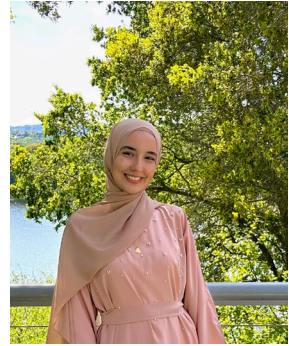
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‘COLONIZING THE MINDS’: THE DEVELOPMENT OF LINGUISTIC IDENTITY IN COLONIAL AND POSTCOLONIAL ALGERIA

HADIL DJARDI



WRITER’S COMMENT: During a discussion in my History of Development in Africa class, we analyzed the remnants of colonialism in African societies despite geographical independence. This led me to reflect on how French influence is omnipresent in Algerian society, from the French words in the Algerian Arabic dialect to Algerian street signs with French written underneath Arabic text. When Professor Decker assigned a research paper later in the course, I drew inspiration from the class discussion and researched how Algerian education policies shifted from the colonial to the postcolonial period and their effects on the development of Algerian linguistic identity. In addition to secondary research, I interviewed an Algerian who experienced part of their schooling in colonial Algeria and another Algerian who started school after independence. Their oral histories explain how Algerians at the time conceptualized their linguistic identity based on educational experience, and whether or not this conceptualization changed after independence. As I discovered through my research, French colonial education policies to subordinate and “civilize” local populations ended up creating linguistic tension between people’s mother tongues and the colonial language.

INSTRUCTOR’S COMMENT: Hadil did so much more than complete a well-written, clearly argued research paper on linguistic identity in Algeria. She brought her reader into the center of linguistic tensions, national struggle, and the varied imprints of French colonialism in postcolonial Algeria. I was thrilled when she told me of her plans to use oral histories as the main primary sources for this project. Her

knack for analytical framing and historical contextualization made these personal narratives both profound and familiar. This beautiful paper tells us not only about the history of shifting language policies in Algeria, but the more valuable story of how people of different generations see themselves and their nation in this history.

- Corrie Decker, History Department

Part I: Introduction

Charles Richard, a French military officer during the colonization of Algeria, described the aspiration of colonial rule as capturing the “minds” and “bodies” of the colonized.¹ To “capture” the minds of Algerians, the French colonial apparatus imposed French language and culture on indigenous populations, who mostly spoke Tamazight or dialectal Arabic.² Language is a pillar of identity and people’s sense of self relative to society. It became a valuable tool in colonial development policy to “modernize,” “civilize,” and, in this case, “Frenchify” indigenous populations and their sense of self.

The imprint of French colonialism on Algerian linguistic identity and education is essential to understanding Algerians’ perceptions of their sense of self and French colonial efforts across the African continent. This research paper will explore how education policy in Algeria shifted from the colonial to the postcolonial period and how these changes have shaped Algerian linguistic identity. While colonial education policies defined linguistic identity based on French hegemony and postcolonial education policies redefined

¹ Yusuf Progler, “Schooled to Order: Education and the Making of Modern Egypt,” Institute of Contemporary Islamic Thought (ICIT) Digital Library, January 1, 2008, <https://www.icit-digital.org/articles/schooled-to-order-education-and-the-making-of-modern-egypt>

² Mohamed Benrabah, *Language Conflict in Algeria: From Colonialism to Post-Independence* (Bristol: Multilingual Matters, 2013), 38.

Algerian linguistic identity to counteract the colonial narrative, both policies exacerbated tensions in how Algerians perceived their linguistic identity and what place different languages had in Algerian education and society. This research will situate oral histories from the lived experience of Algerians in the context of postcolonial debates about linguistic identity.

Part II: Setting the Stage: Pre-colonial Algeria and the Concept of Linguistic Identity

Before the conquest of Algeria by various empires and French colonialism, Algeria was home to the Amazigh, a diverse ethnic group indigenous to North Africa.³ Multilingualism was a key facet of pre-colonial Algerian society, and Mohamed Benrabah frames it as a “byproduct” of contact with invaders like the Phoenicians, Romans, Byzantines, and Turks.⁴ Meanwhile, Arabic spread to Algeria and other parts of North Africa through Muslim conquests beginning in the seventh century.⁵ Additionally, despite Turkish being the official language of Ottoman Algeria, Turks used dialectal Arabic to communicate with indigenous populations and to write “in popular poetry and official correspondence.”⁶ This contrasts French colonial policies that would later sideline indigenous languages and dialects in favor of French. Algeria was a settler colony and legally an “extension” of metropolitan France, which defined French colonial policies.⁷ French linguistic and cultural identity was thus omnipresent in Algerian society and national consciousness.

To better understand how Algerians perceive their linguistic identity and how they have reflected on their lived experience, two interviews were conducted with Algerians who were born and raised

3 Benrabah, *Language Conflict in Algeria*, 22

4 Ibid., 22-23

5 Ibid., 22.

6 Ibid., 23.

7 Ibid., 29.

in Algeria. Interviewee A was born in 1955 and lived seven years of their youth in French-occupied Algeria, whereas Interviewee B was born in 1963, one year after Algerian independence.⁸ As Interviewees A and B reflected on their linguistic identity, both interviewees perceived language as an integral part of their sense of self. Interviewee A described how “language is like my foot and arm,” meaning language is so important to them that functioning without it would be difficult.⁹ Interviewee B expressed the importance of language to them by describing the effect of its absence, asserting that “A person without a language is a person without a nation.”¹⁰ Interviewee B connects language to not only their sense of self but also their sense of belonging within a community of like individuals. Given Algeria's colonial history, these perspectives are integral to understanding the importance of linguistic identity for Algerians. Because the colonial apparatus systematically replaced indigenous languages with French in the public sphere, this challenged Algerians' sense of self, belonging in their communities, and individuality, albeit to varying degrees depending on lived experience. This phenomenon fostered resistance to Frenchification within the Algerian community, which morphed into an armed struggle for independence from 1954 to 1962.¹¹ The colonial “imprint” on Algerian linguistic identity continued to shape how Algerians in the postcolonial period perceived their identity and what policies the government implemented to counteract French hegemony.

8 Interview with an Algerian (Interviewee A), interview by author, Walnut Creek, California, November 22, 2023; Interview with an Algerian (Interviewee B), interview by author, Walnut Creek, California, November 22, 2023.

9 Interviewee A, interview.

10 Interviewee B, interview.

11 Benrabah, *Language Conflict in Algeria*, 40.

Part III: French Colonial Education Policy and Linguistic Hegemony (1830–1962)

The colonial apparatus asserted its dominance in Algerian society in schools by teaching native populations French language and history. In *Language Conflict in Algeria*, Mohamed Benrabah quotes the French Minister of Public Education in 1897, who stated: “[The] conquest will be by the School: this should... inculcate in the Muslims our own idea of what France is and of its role in the world.”¹² This statement from a French colonial official explains how French schools became the breeding ground for disseminating the French language and culture. Additionally, French schoolteachers across the colonies taught schoolchildren a “shared” French history to strengthen the connection to Frenchness beyond linguistic identity.¹³

France molded schoolchildren’s identity by using education policy as an effective target of colonialism, causing tensions in their linguistic identity. Interviewee A experienced French colonial schooling in primary school and explained how their upbringing caused tension in their linguistic identity. When asked what they thought the indigenous language of Algeria was growing up, Interviewee A stated, “I thought it was French. I did not know how to distinguish between myself and the French who occupied us.”¹⁴ Interviewee A went on to describe how using the French language caused internal tension for them, asserting that “[The colonizers] introduced thoughts [in my head] that were not mine.”¹⁵ Interviewee A’s lived experience highlights how French education policy sidelined indigenous cultures by teaching school children

12 Ibid., 31.

13 Jonathan Gosnell, *Politics of Frenchness: Colonial Schools and the Transmission of French Culture* (Rochester: University of Rochester Press, 2002), 45.

14 Interviewee A, interview.

15 Ibid.

that they were French and only French.

Different languages and dialects played different “roles” in society and education policy, with colonial officials perceiving Arabic and Tamazight as subordinate to French. Standard Arabic was a “foreign language” option in schools until 1947 when French authorities gave it “official language status to be used in schools.”¹⁶ This subordination of Arabic in schools, and the absence of Tamazight instruction, reflects the subordination of Algerian people and their mother tongues. Although the French language seeped into Algerians’ life in school, Interviewee A noted that the French language “did not have a big impact at home” because their parents were uneducated, so Interviewee A and their siblings only spoke dialectal Arabic at home.¹⁷ Thus, the French colonial apparatus did not wipe indigenous languages from the minds of Algerians entirely.

France established a social hierarchy that placed Algerians beneath European settlers and reinforced this hierarchy through education policy. In 1892, France separated Arab and Amazigh school children from Europeans by constructing “indigenous schools” and developing two different “tracks” of instruction for European and indigenous Algerian schoolchildren.¹⁸ In the indigenous schools, French teachers initially taught Arab and Amazigh children vocational and agricultural skills, and textbooks reinforced Algerians’ position in society as “workers and peasants” through characters like “Ali the Jeweler” and “Sliman the basketmaker.”¹⁹ Colonial education disseminated the French language and culture, yet it also tailored the instruction of Algerians to fit France’s vision for their role in colonial society.

France systematically limited access to education based on class divisions, which further subordinated poor, indigenous

16 Gosnell, *Politics of Frenchness*, 47-48.

17 Interviewee A, interview.

18 Gosnell, *Politics of Frenchness*, 47.

19 *Ibid.*, 46

Algerians to rich Algerians and European settlers. Language studies scholar Jonathan Gosnell describes how Algerian colonial schooling reflected the social hierarchy of settler society, which parallels how Interview A perceived education in colonial Algeria.²⁰ Although they were in elementary school at the time, Interviewee A reflected on older students' experiences to describe class divisions and discrimination in France's education policies. According to Interviewee A, "High schools were not everywhere, only in big cities where government employees and rich people lived... only kids of people in the administration, the police, and rich businessmen studied beyond middle school."²¹ Privileged families, which included European settlers and rich Algerians, could easily educate their children. The social hierarchy was thus race and class based. Creating a largely uneducated, poor class of Algerians ultimately strengthened France's stronghold on Algeria because it reinforced divisions in society.

The "civilizing mission," which justified colonial expansion and discrimination towards the colonized, underscored France's colonial education policies. The European mission to "civilize" and later "modernize" African societies reflected how colonial powers treated and educated indigenous populations, particularly in settler colonies like Algeria. Interviewee A described their experience living with European settlers in their hometown, stating that discrimination towards poor Algerians was present in classrooms as "French teachers used to bring lice powder and put [it] in our hair, [and] I used to walk home with white powder in my hair."²² Interviewee A's experience with discrimination in the classroom is a byproduct of France's colonial education policies because many European settlers perceived Algerians as dirty and lower-class.

Colonial education policy created resistance from some Algerian parents who challenged French linguistic and cultural

20 Gosnell, *Politics of Frenchness*, 47; Interviewee A, interview.

21 Interviewee A, interview.

22 Ibid.

hegemony. As historians Corrie Decker and Elisabeth McMahon describe in Chapter 10 of *The Idea of Development in Africa: A History*, “Colonial schools instilled in African students the notion that Europeans and Africans were on separate paths of development, but Africans did not accept these lessons passively.”²³ When evaluating colonial education policies, it is important to consider how African societies resisted colonial efforts to shape their identity. The mainstream historical narrative often neglects Africans’ agency in matters that affected them. This agency and resistance to colonial schooling was present in Algeria because many Arab and Amazigh parents “...who were able to send their children to French schools often chose not to do so.”²⁴ Similarly, Interviewee A explained how some Arab parents initially resisted colonial education for their children “because they wanted them to learn Arabic and be closer to their religion.”²⁵ They did not want French education to weaken their children’s connection to their native tongue and culture. Similarly, in colonial Zanzibar, some mothers removed their children from British colonial schools when they felt threatened by the school and particularly its intrusive policies related to hygiene and medical inspection.²⁶ Although Zanzibar was a British colony, its parallel to French colonial education in Algeria reflected both the colonial nations’ objective to control indigenous populations through schooling and resistance within the very communities the colonizers sought to control.

Religious identity became an avenue for reclaiming Arabic as part of Algerian linguistic identity, and it functioned as a form of resistance against colonial oppression. Some Algerian parents

23 Corrie Decker and Elisabeth McMahon, “Lessons in Separate Development” in *The Idea of Development in Africa: A History*, (Cambridge: Cambridge University Press, 2020), 209, <https://doi.org/10.1017/9781316217344>

24 Gosnell, *Politics of Frenchness*, 49.

25 Interviewee A, interview.

26 Corrie Decker, “Training Girls for Colonial Development,” in *Mobilizing Zanzibari Women: The Struggle for Respectability and Self-Reliance in Colonial East Africa*, Londone: Palgrave Macmillan, 2014, 4.

educated their children in Islamic schools organized by the ulema, or Muslim scholars.²⁷ parents educated their children in Islamic schools organized by the ulema, or Muslim scholars. Although Interviewee A attended most of primary school under French occupation, their parents simultaneously enrolled them in an Islamic school at the local mosque.²⁸ Interviewee A reflected on the role of the ulema, who “...were secretly teaching people Arabic through the Quran, and they let [students] know that they are not French, that France colonized them, and that their origins are not European.”²⁹ In her introduction to Algerian cultural nationalism, language scholar Anne-Emmanuelle Berger cites a famous quote by Ben Badis, an Algerian Islamic scholar: “Islam is our religion, Arabic is our language, and Algeria is our country.”³⁰ This quote became a rallying cry for Arab Algerians, although not Amazigh Algerians, and eventually contributed to Arab nationalist sentiment in Algeria.

Part IV: Changes in Education Policy and Linguistic Identity Post-Colonialism (1962–)

Algerian resistance to French linguistic and cultural hegemony culminated in organized national resistance with the Algerian War of Independence, which lasted from 1954 to 1962. The National Liberation Front, the organization that led the Algerian resistance, adopted the Tripoli Program that outlined their vision for postcolonial Algeria and the revival of Algerian identity through a “cultural revolution.”³¹ According to this document, this cultural

27 Gosnell, *Politics of Frenchness*, 49.

28 Interviewee A, interview.

29 Interviewee A, interview.

30 Anne-Emmanuelle Berger, ed., “Introduction,” in *Algeria in Others’ Languages*, (Cornell: Cornell University Press, 2002), 3.

31 National Revolutionary Council of the National Liberation Front (FLN), “The Tripoli Program: Program of the Algerian Revolution,” June 1962, Conference held in Tripoli, Libya, Hoover Institution, 11.

revolution entailed, among other things, a “...restoration of a national culture” with the introduction “...of the Arab language and culture into the schools...”.³² After independence, education policies shifted as the Algerian government, which included FLN members, sought to establish a national Algerian identity that subordinated French influence in society.³³ However, like French colonial policies, postcolonial education policies exacerbated tensions between the roles of different Algerian languages and dialects in society.

Debates over the role of the French language in postcolonial education and society reflected the newly independent government’s Arabization policy, which it implemented to replace French instruction and usage in the public sphere with Standard Arabic.³⁴ Proponents of Arabization saw this as a revival of pre-colonial Algerian identity, whereas opponents believed the policy sidelined multilingualism in Algerian linguistic identity, particularly Tamazight.³⁵ The Arabization of the Algerian schooling system rapidly began in 1964 and continued at different levels of education until the 1980s.³⁶ When the government initiated the Arabization policy in education, Interviewee A was in high school and recounted how “in one year we were learning in French and the next we began learning in Arabic.”³⁷ This rapid shift reflected the government’s desire to phase out French influence on Algerian education as quickly as possible. However, Arabizing school instruction did not apply to all fields of study and all levels of public education. The government completely Arabized the primary and secondary education levels by 1975; higher education retained French instruction in “scientific fields of study” while instructors

32 Ibid., 18.

33 Benrabah, *Language Conflict in Algeria*, 52.

34 Benrabah, *Language Conflict in Algeria*, 53.

35 Ibid., 54.

36 Ibid., 62-64.

37 Interviewee A, interview.

taught humanities and social sciences in Standard Arabic.³⁸ This policy mirrors Interviewee B's experience studying in postcolonial Algeria. In primary and secondary school, they learned math, science, history, and geography in Arabic, whereas French was only taught in French language classes.³⁹ Thus, Interviewee B's experience reflects how French became subordinate to Standard Arabic in postcolonial education, a complete reversal of pre-colonial education policy.

In postcolonial Algeria, languages played different roles in Algerian education and society and partly reflected colonial standards. In 2004, Benrabah surveyed the societal roles Algerian secondary school students attributed to different languages.⁴⁰ Overall, students perceived French as the language of STEM, modernity, and globalization; Standard Arabic as the language of religion and morality; and dialectal Arabic as the language of Algerian-ness and sense of self.⁴¹ Benrabah conducted his study in an Arab part of Algeria and thus did not account for the perspective of Amazigh students. However, he cites a separate study assessing Amazigh college students who viewed French as the language of modernity and opportunity and Tamazight as the "language of the elders," which symbolizes a generational connection to the language.⁴² Students' relatively uniform perception of French as the language of modernity and globalization reflects how colonial apparatuses imposed their languages to "civilize" and later "modernize" indigenous populations. This colonial imprint in Algerian education remained in postcolonial Algeria, and

38 Benrabah, *Language Conflict in Algeria*, 62-64.

39 Interview B, interview.

40 Benrabah, *Language Conflict in Algeria*, 78.

41 Ibid., 78.

42 Benrabah, *Language Conflict in Algeria*, 78-79.

Benrabah's study highlights how some Algerians internalized the association of French with modernity. Historian E.S. Atieno Odhiambo similarly expressed the danger of sidelining indigenous languages in postcolonial African societies, stating that "So long as governments and the academy remain trapped in this prejudice against our cultures, and as long as we, the citizens of Africa, privilege them with the plenitude of power, there will be no meaningful development in Africa."⁴³

Additionally, the Algerian dialect of Arabic reflects the imprint of the French language on Algerian society. Interviewee A pointed out how dialectal Arabic is a mix of Arabic and French, whereas the French language has not influenced Standard Arabic.⁴⁴ Researchers Mohamed Amine Menacer et al., who developed an "Automatic Speech Recognition system" for Standard Arabic and the Algerian dialect, support this conclusion.⁴⁵ Their research includes an analysis of French influence on the Algerian dialect, and they describe how Algerians incorporated French into the dialect by "phonologically [altering]" French words or, in some cases, by using the exact French word.⁴⁶ The resistance of Standard Arabic to French linguistic influence, unlike dialectal Arabic, allowed the Algerian government to decolonize education policy and to revive a national identity based on religion.

Differences in Interviewee A and Interviewee B's lived experiences reflect how colonial and postcolonial education policies shaped how Algerians perceived their linguistic identity. As Interviewee A reflected on changes in their linguistic identity in life after Algerian independence, they noted how although the

43 E.S. Atieno Odhiambo, "The Cultural Dimensions of Development in Africa," *African Studies Review* 45, no.3 (2002), 11.

44 Interviewee A, interview.

45 Mohamed Amine Menacer et al., "Development of the Arabic Loria Automatic Speech Recognition System (ALASR) and Its Evaluation for Algerian Dialect," *Procedia Computer Science* 117 (January 1, 2017):1, <https://doi.org/10.1016/j.procs.2017.10.096>.

46 *Ibid.*, 2-3.

French language “stuck” with them, learning Arabic and later English in school meant they no longer felt compelled to identify with the French colonial identity.⁴⁷ This shift in their perception mirrored the government’s Arabization policy. On the other hand, Algerian students like Interviewee B connected less with the French language from the beginning of their education. After independence, French became a foreign language option in Algerian grade schools, subordinating French to Arabic.⁴⁸ Interviewee B described how their primary education was entirely in Arabic.⁴⁹ In secondary school, the government initially divided instruction into two “tracks,” where students learned in Arabic or had a mix of French and Arabic classes, and Interviewee B chose to follow the Arabic track.⁵⁰ Unlike Interviewee A, Interviewee B did not feel compelled to identify with the French language, and speaking French did not cause tension in Interviewee B’s identity based on their reflections.⁵¹ Instead, Interviewee B expressed the benefit of knowing multiple languages and how “learning a second language with your mother tongue being the first adds to you, it does not take away from you.”⁵²

Part V: Conclusion

French colonial education policy created tension in linguistic identity for Algerians like Interviewee A, who grew up in colonial Algeria. Although they had different incentives, colonial and postcolonial education policies adopted similar strategies to shape Algerian linguistic identity and raised questions about multilingualism in Algerian society. In both cases, language became the vehicle to disseminate and nationalize a connection to

47 Interviewee A, interview.

48 Benrabah, *Language Conflict in Algeria*, 62.

49 Interviewee B, interview.

50 Ibid.

51 Interviewee B, interview.

52 Ibid.

a particular identity, and education policy reflected this process. Colonial education policies in Algeria mirrored the experiences of other African societies because colonial languages were a mechanism of control over indigenous populations. Their imprints on African societies, even after independence, highlight how colonial languages and cultures permeated the minds of the colonized. Based on Interviewees A and B's lived experiences, systematically taking away people's language as France had done in colonial Algeria challenges their sense of self, belonging in their community, and individuality. In the postcolonial period, many Algerians reclaimed their linguistic identity, although national policies put Standard Arabic at the forefront of education. The continued presence of French in Algerian society and education brings into question whether it is possible and necessary to "phase out" colonial linguistic influence from ex-colonies. Based on this research, language is a pillar of identity and sense of self for Algerians. Yet, in the absence of French colonial authority, many Algerians have embraced their linguistic identity without completely removing the French language from quotidian life.

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BIG MIKE: THE ATTACKS ON MICHELLE OBAMA AND MASCULINIZATION OF BLACK WOMEN

SOFIA HOSSEINZADEH



WRITER'S COMMENT: When I saw a 10 page research paper on an American conspiracy theory of my choice as the final assignment for my HIS 102M seminar, I honestly felt daunted having no experience in research. While brainstorming ideas, I came across the conspiracy theory that Michelle Obama is biologically a man. Immediately, my mind began to connect this theory with the papers I read in my Introduction to Gender Studies course that highlighted how the binary gender system excludes women of color from the definition of womanhood. At that moment it felt like a lightbulb lit up in my brain. Analyzing this conspiracy theory under a gender studies lens allowed me to conclude that the separation of Michelle Obama from her womanhood in this conspiracy theory exemplified the relationship between race and the binary gender system and its effects on power structures. An initially scary writing project transformed into a passion project as I learned that I actually love research and cementing my own arguments and opinions on moments in history

INSTRUCTOR'S COMMENT: Sofia was a standout student in my 2023 course on the history of U.S. conspiracy theories. The assignment required the students to choose one theory, put it in historical context, and explain why it spread. Sofia boldly chose to study a very unpleasant topic: the racist, misogynist, transphobic conspiracy theories about Michelle Obama. Sofia decided that it was important to understand how these vile theories began in order to combat them. Her paper adeptly combines empirical research with relevant gender frameworks and concludes that these conspiracy theories drew upon

old tropes of masculinized Black women that date back to slavery. The resulting paper is not just a great work of scholarship: it is, as Sofia tells us, a reminder of the "boundaries of femininity and race in America."

- Kathryn Olmsted, History Department

American history remembered the 2008 election for electing America's first black president; however, this recollection of the election ignored another monumental element of the 2008 election: America's first black first lady. The reaction to this election brought praise by many Americans inspired to see a black family overcome the plethora of systemic barriers meant to keep black Americans away from a position of such power. As expected of a country founded on white supremacy, President Obama also became the target of numerous racist attacks and conspiracy theories. These theories ranged from fears of the "New World Order" to discrediting the president's nationality and religious affiliation. Michelle Obama, despite occupying a much less politicized position, did not escape the racist attacks. Far-right conspiracy theorists worked to defame the First Lady through attacks on the one element central to the position of the first lady: her womanhood. The conspiracy theory claiming Michelle Obama is a man relied on racist stereotypes of black women to delegitimize Michelle Obama's position and strip her of her femininity.

Since its founding, the United States government depended on not just a man to run the White House. The first lady received an important new title and role placed upon her due to her husband's electoral victory. As America's first ever first lady, Martha Washington possessed the important role of defining the position. She established the proper role of a first lady by serving as a consort for events held in the capital.¹ The legacy Martha Washington

¹ Maurine H. Beasley, *First Ladies and the Press: The Unfinished Partnership of the Media Age* (Evanston: Northwestern University Press, 2005), 27.

left for future first ladies focused on domestic duties and avoided politics. Martha helped create a position that acknowledged the influence of being the president's wife without overstepping the confines of a woman. This position satisfied gendered expectations of the time, when politics were viewed as a sphere suited solely for men. While future first ladies began pushing the boundaries between their position and politics, the expectation to uphold femininity remained constant. The first lady stood as a symbol for "White middle to upper class femininity."² This role hyper-fixed on the individual's identity as a wife and her race as a white woman. The first lady's symbolism transformed her to a public figure who broadcasted her femininity to the entire nation.

The legacy of the first lady relied on white womanhood. This meant Michelle Obama did not fulfill the stereotypical image of the first lady simply because of her race. As scholars have argued, the position of the first lady came with the ramifications of how femininity existed for white women; therefore, the version of femininity available to Michelle Obama inherently did not satisfy the expectations of her role.³ White women historically defined "femininity" while women of color have been forced outside of this image. Some media critiques of Michelle Obama during the 2008 election exemplified the ways femininity excluded black women. Critics described Michelle Obama as a "dominant" and "angry" woman lacking femininity.⁴ These descriptions all contrasted the timid and gentle behavior expected of a woman. Even before she assumed the role of first lady, the media worked to separate Michelle Obama from the feminine expectations of the first lady.

2 Rosalind Clair Gill, Christina Scharff, and Lisa Guerrero, "(M)Other-in-Chief: Michelle Obama and the Ideal of Republican Womanhood," in *New Femininities Postfeminism, Neoliberalism and Subjectivity*. (Basingstoke: Palgrave Macmillan, 2013), 69.

3 Gill, Scharff, and Guerrero "(M)Other-in-Chief," 69.

4 Ilex Badas and Katelyn E. Stauffer, "Michelle Obama as a Political Symbol: Race, Gender, and Public Opinion toward the First Lady" in *Politics & Gender* 15, no. 3 (2019), 443.

While the gendered expectations of the first lady remained stagnant, the relationship between the first lady and politics continued to grow tense. During the time between Martha Washington's and Michelle Obama's eras, women slowly entered the political realm. Despite attempts at progress, American society still pushed back. Scholars found the American public more receptive to first ladies who took a passive role in her husband's administration.⁵ Americans resisted the transition of the first lady away from its apolitical origins and desired a first lady defined by her domestic capabilities. Michelle Obama embraced America's preferences for their first lady. At the 2008 Democratic National Convention, Michelle Obama called herself a mother, wife, and daughter in her speech.⁶ Michelle Obama understood the fragile balance she faced with politics and marketed herself based on her femininity to satisfy this balance. Despite not racially representing the traditional first lady, Michelle Obama compensated by obeying the apolitical expectations of her role.

These attempts at compensation did not save Michelle Obama from brutal attacks, especially among the far right. Michelle Obama relied on her gender to establish her place as first lady, making this element a target for conspiracy theorists. Michelle Obama's gender came under large-scale scrutiny in 2014 thanks to a joke-gone-wrong by comedian Joan Rivers. After a reporter asked if Rivers believed Americans would elect a gay president before a female one, she responded saying America already chose a gay president with President Obama because "Michelle is ... a transgender. We all know."⁷ This claim made by a celebrity with a large platform sparked a following who skewed the intentions of Rivers' joke. Her comments simply existed as an offensive joke, but many far-right conspiracy theorists saw her stunt as exposing

⁵ Badas and Stauffer, "Michelle Obama as a Political Symbol," 438.

⁶ Badas and Stauffer, "Michelle Obama as a Political Symbol," 440.

⁷ Patricia A. Turner, *Trash Talk: Anti-Obama Lore and Race in the Twenty-First Century*, (Oakland: University of California Press, 2022), 119.

the “truth.” To worsen Rivers’ mistake, her claim became martyred after her death later that same year. The far right quickly theorized the Obamas caused her death from surgery complications due to “exposing” Michelle’s gender identity.⁸ What Rivers intended to exist as a shocking and short-lived joke transformed into a genuine conspiracy theory with a following that still exists today.

After Rivers’ accusation of Michelle Obama’s gender, conspiracy theorists turned to social media to spread what they viewed the truth about the first black first lady. A Facebook post by user Karen Jorgensen posted a photo of a smiley face emoji background with the text “How many of you still don’t know



Figure 1: Karen Jorgensen. "How many of you still don't know that michelle obama was born michael lavaughn robinson and is a man?" Facebook, August 18. <https://archive.vn/9RBfQ>

that michelle obama was born michael lavaughn robinson and is a man?" (Fig. 1). The conspiracy theory at its core spread a combined racist and transphobic message, but Jorgensen promoted this message using a seemingly innocent background. The juxtaposition between the presentation of the post and the disturbing nature of the Jorgensen’s message attempted to transform the conspiracy theory from existing deep in the far-right community into a post for casual consumption on one of the most used social media websites online.

⁸ Zach. "Is Michelle Obama a Man?" YouTube, July 30, 2023. 7:16 to 7:25.

On another widely visited social media website, Instagram, user Gunsbeerliberty posted a photoshopped image of Michelle Obama and Barack Obama with the caption “Just 2 dudes before they were husband and wife!” (Fig. 2). Like the Jorgensen post, this Instagram post manipulated the dark nature of the conspiracy theory into a superficially harmless message. Fellow internet users famously employ the same font



Figure 2: Gunsbeerliberty. "Just 2 dudes, before they were husband and wife!" Instagram, May 27, 2021. https://instagram.com/p/CPYdBKqNj5ol?utm_source=ig_embed&ig_rid=07a69545-4a8e-9c24b720bea3.

as in Gunsbeerliberty's post for memes, online jokes. The font choice of this post purposefully groomed unsuspecting online users into becoming followers of the theory by presenting it as a harmless joke. Some Instagram users may first laugh at the post, but to react with any emotion other than disgust at the theory revealed a possible risk to becoming a future follower. This post also obeyed a key element to the conspiracy theory. The photoshopping of Michelle Obama's face to make her appear as a man demonstrated how the theory relied on masculinization to prove its point. To unsuspecting viewers that perceived the post as harmless humor, Gunsbeerliberty created a link between Michelle Obama and masculinity. The post implied there “existed” an inherent masculinity in Michelle's appearance that could make her easily appear as a man with some slight photoshopping.

This idea of Michelle Obama's physical masculinity played a key role in the evidence used by theorists. The YouTube channel “WolvesandFinance” posted a video titled “Is Michelle Obama a Man?” where the presenter, Zach, utilized photographic evidence to “prove” the theory. In a photo of Michelle Obama's back in a sleeveless dress, Zach argued Michelle Obama's back looked “wide and very



Figure 3: Zach. "Is Michelle Obama a Man?" 24:56 to 25:16

muscular.”⁹ Zach aimed to prove Michelle Obama is a man through a devil’s advocate approach where he “disproved” the theory using weak evidence to imply the absurdity of not believing in the theory. Using an image of a female Yale rowing team with slimmer shoulders than the first lady, he reasoned Michelle’s wide shoulders looked like the average back of a female athlete (Fig. 3). Rowing engages upper body strength, but it does not cause the athlete to grow a wide back from muscle use. The specific tactic utilized by Zach presented arguments made by non-believers as absurd, even when he relied on inaccurate evidence. According to Zach’s logic, Michelle Obama’s physical appearance exceeded the capabilities of even the most fit women. This argument insinuated the far-right believed they could easily see through Michelle Obama’s attempt to “appear female” in a way the general public could not.

Another social media figure, Alex Jones, utilized his platform to repeatedly expose Michelle Obama of her “true” gender through much more brash comments. In his video “Big Mike EXPOSED a Decade Ago” Jones took a facade of attempting to be cordial towards the first lady and then proceeded to insult her femininity. His comments included referring to Michelle as an “NBA center” and asserting, “She looks more like Shaquille O’Neal than a black woman.”¹⁰ Jones not only stripped Michelle Obama of

⁹ Zach, “Is Michelle Obama a Man?” 24:51 to 24:56.

¹⁰ Alex Jones, “Big Mike EXPOSED A Decade Ago” Banned.Video, July 9, 2014. 1:09 to 1:27. <https://banned.video/watch?id=64d27ff9eb383262dc5c508e&list=5ef52502672706002f2eacb1>

her femininity, but he worsened the severity of his comments by comparing Michelle to an athlete with stereotypical male features. Shaquille O'Neal's extremely tall and muscular stature exemplified the ideal man, but heavily contrasted the typical image expected of women. Jones took his comments further by implying Michelle's appearance may result from a genetic disorder. He speculated Michelle Obama has Klinefelter syndrome, a condition where an individual has two X chromosomes and one Y.¹¹ Similar to the comparisons to Shaquille O'Neal, Jones distanced Michelle Obama from her femininity on a biological basis. Just like Zach's video, Jones depended on the idea that gender easily falls into clear categories on a biological basis. To these theorists, Michelle Obama did not mark all the boxes they expect in a woman; therefore, Michelle Obama could not be a woman despite presenting herself as one. Zach and Jones' ability to "expose" Michelle Obama's "real" gender based on visual biological details communicated that certain Americans always saw through her "feminine facade."

In addition to attacks on Michelle Obama to prove the theory, theorists analyzed the actions of Barack Obama to find evidence of Michelle's gender identity. In one infamous video used to incriminate Michelle Obama, President Obama allegedly referred to Michelle as "Michael."¹² The identity of this "Michael" is left unanswered; however, the far right obsessed over this video as it clearly "proved" their theories correct. Alex Jones mentioned this video in his own discussions of Michelle's gender claiming, "I've never called my wife 'Eric', her name's Erica."¹³ In the previously discussed video, "Is Michelle Obama a Man?", Zach also exploited

11 Jones, "Big Mike EXPOSED A Decade Ago" 5:50 to 5:55.

12 EXPOSE the PEDOS end of the CABAL. "MICHELLE OBAMA WAS A MAN." Rumble, 2022, 0:04-0:05. <https://rumble.com/v1jtqsh-michelle-obama-was-a-man.html>.

13 Alex, Jones. "It's Official, Michelle Obama aka 'Big Mike' Set to Announce Presidential Run," Banned.Video, September 16, 2023, 4:33 to 4:40. <https://banned.video/watch?id=65134dfd15f886afe080b43b>.

the video to draw suspicion against Michelle Obama's gender identity. In his video he asked the audience, "For those of you who are married out there. Is it unusual for a married person to call their partner by the wrong gender?"¹⁴ While the names "Michael" and "Michelle" sounded similar, the only logical explanation according to theorists pointed towards an accidental exposure of Michelle Obama's "deadname," her name when she presented as a man, causing theorists to coin the phrase "Big Mike" to reference Michelle Obama's "true" identity. The right-wing media quickly judged President Obama for this video finding no room for doubt that it joined their plethora of evidence of the conspiracy theories against the first black first lady.

Of the over 40 first ladies in America before Michelle Obama assumed the role, none faced the treatment Michelle Obama did. Why accuse Michelle Obama of being a man? The answer pointed to race. The Obamas were the first family of color to ever assume the role of president and first lady. Their progress threatened the status quo. The easiest way to take the family down lay in growing distrust between the people and the Obamas. Alex Jones abused the growing disapproval in the government arguing if the Obamas always lie, then Michelle Obama could also lie about her gender.¹⁵ The far right wanted to shape the legacy of the first black president and first lady as a period full of lies. Patricia Turner in her book *Trash Talk* described these machinations as "[Invalidating] the real Obama and Robinson narratives as well as the stories of so many other black families who, like them, successfully pursued economic mobility."¹⁶ The far right hated the presence of the Obamas because they defied the boundaries set in place to keep black Americans away from the positions they occupied. Conspiracy theorists did not only attack the Obamas because of political differences. The far-right armed their attacks with racist sentiment in response to

14 Zach, "Is Michelle Obama a Man?" 18:58 to 19:04.

15 Jones, "Big Mike EXPOSED A Decade Ago," 9:28 to 10:55.

16 Turner, *Trash Talk*, 123.

their faltering grip on control in American politics.

The far right wanted to denounce this mobility through attacking the Obamas' very identity. As discussed earlier, the first lady relied on femininity as a core element to the position. Accusing Michelle Obama of being a man implied Michelle never fulfilled the qualifications of her position. The damages of these accusations went further by also incriminating President Obama. Many conspiracy theorists concluded if Michelle Obama is a man, that made President Obama a gay man.¹⁷ While their relationship still fit the definition of a heterosexual relationship due to Michelle identifying as a woman and Barack as a man, theorists wanted to feminize President Obama as homosexuality is stereotypically seen as effeminate. These accusations made against the Obamas in response to their economic mobility served the purpose to build as many associations as possible between the Obamas and historically illicit identities.

The act of feminizing President Obama and masculinizing first lady Michelle mimicked racial dynamics established far before the 2008 election. The far right targeted the Obamas due to their race, but to specifically attack them based on their gender identities demonstrated the ways in which gender and race intertwined. Maria Lugones in her work "The Coloniality of Gender" described this inseparable relationship between race and gender.¹⁸ Lugones postulated women of color only existed under a combined lens of race and gender. This means analysis of the conspiracy theory surrounding Michelle Obama must consider both race and gender as both elements shaped the way Americans treated her. Utilizing these two methods of analysis revealed the way the conspiracy theory surrounding Michelle Obama's gender perpetuated already established racial and gendered stereotypes. The stereotypes used against Michelle Obama played a key role in establishing European

17 Zach, "Is Michelle Obama a Man" 1:32 to 1:42.

18 Maria, Lugones. "The Coloniality of Gender," In *Globalization and the Decolonial Option* (Routledge, 2013), 373.

dominance in the Americas. European colonizers in America relied on dehumanizing indigenous women based on European constructs of race and gender to invade the Americas and form colonies.¹⁹ From before the formation of the United States, the region known today as America relied on suppressing women of color to exist. Michelle Obama's presence as the first black lady disrupted the dominance of white Americans established centuries ago. Conspiracy theorists responded to this imbalance by attacking Michelle Obama's gender expression to restore the power initiated by European colonizers utilizing the same methods.

The ties between the attacks on Michelle Obama and historical suppression of women of color go further beyond simply accusing Michelle Obama of being transgender. These conspiracy theories focused on masculinizing Michelle Obama by commenting on her wide shoulders and arguing she biologically could not be a woman. The obsession with categorization based on biological traits constructed a key feature of the European system of gender.²⁰ The relationship between the gender system and biological factors constructed a formula for repressing the power of women of color. White women face scrutiny for their womanhood; however, they served as the model for a woman.²¹ This method placed women of color outside the requirements set by their white counterparts. Michelle Obama occupied a role centered around femininity, but the conspiracy theory surrounding her gender served as a reminder of Michelle Obama's incapability to satisfy European expectations of gender. To the far right, Michelle Obama's race disqualified her from being seen as "feminine" enough to execute her role as the first lady resulting in accusations against her gender.

While Michelle Obama's time as first lady already ended, the conspiracy theories continued to haunt her image as a political figure. With the upcoming 2024 election, conspiracy theorists

19 Lugones, "The Coloniality of Gender." 379.

20 Lugones, "The Coloniality of Gender." 376.

21 Lugones, "The Coloniality of Gender." 382.

resumed their harassment of Michelle Obama with speculations she may run for president. The connotations surrounding these conspiracies all centralized fear mongering as a core element in their discussions. Alex Jones described Michelle Obama's candidacy as a dictatorship with Democrats planning to change their electoral rules to ensure Michelle Obama's victory while videos allegedly capturing Michelle Obama with male genitals played in the background.²² While this new theory surrounding the presidential election focused on fearing the previous first lady due to the possibility of a dictatorship, Jones combined these new fears with the age-old fear surrounding her gender to maximize his audience's unease with the Democratic party and the idea of a black woman as president.

The rebirth of the conspiracy theory invited more aggressive investigations of Michelle Obama in pursuit of the "truth." One investigator, Joel Gilbert, researched Michelle Obama's past to document her alleged 2024 run for president. In his investigations, he allegedly discovered Michelle Obama's voting records. In his discoveries he exposed Michelle Obama chose "male" for her sex when registering to vote in Illinois, and she did not correct her sex to "female" until 2008.²³ While Gilbert blamed the records on a clerical mistake, the far-right identified the first lady's voting record as concrete proof of her biological sex. Believers in the theory concluded that one could not accidentally choose the incorrect sex, and Gilbert's discovery provided clear evidence of Michelle Obama's "real" gender.²⁴ The resurgence of this conspiracy theory once again reflected the dynamic between the white ruling class and women of color. While Michelle Obama has not officially announced

22 Jones, "It's Official, Michelle Obama aka 'Big Mike' Set to Announce Presidential Run," 2:01 to 2:18.

23 Joel Gilbert, "Michelle Obama's Changing Sexual Identity," *American Thinker*, July 15, 2022. https://www.americanthinker.com/articles/2022/07/michelle_obamas_changing_sexual_identity.html

24 Zach, "Is Michelle Obama a Man," 23:54.

her involvement in the 2024 election, the far-right must stop the possibility of a black female president. Masculinizing Michelle Obama delegitimizes her power as already historically proven in the history of the United States. As the far right previously reiterated in their reasoning for the conspiracy theory, the Obamas constantly lie to Americans and could not be trusted. If Americans cannot trust Michelle Obama to be transparent about her gender, how can Americans trust her with the fate of the country?

Conspiracy theorists wished to paint Michelle Obama as incapable of fulfilling her responsibilities as first lady though the racist assumption that she could never be seen as a woman. They attempted to delegitimize her power as first lady through judgements on her shoulder size and insinuations of possible genetic disorders. The abuses Michelle Obama suffered expand far beyond herself. Accusing the first black first lady of being a man at its core sent a racist and transphobic message meant to remind black women and other women of color of their position in the European hierarchies of race and gender. Under this system, black women exist outside the boundaries of a “woman” since white women established the standard for this gender identity. Conservatives believed Michelle Obama could never execute the position of the first lady because white womanhood defined the position. Michelle Obama defied the odds systemically placed against her due to her race and gender which posed a threat to the White ruling class. These theories represented more than a harmless joke or theory. These theories left a mark on Michelle Obama’s legacy. Her time as first lady existed as an example of the never-ending negative treatment faced by black women, and as a nationwide reminder of the boundaries of femininity and race in America.

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EXPOSED: THE UGLY TRUTH ABOUT AMERICA'S "JUSTICE" SYSTEM

MADISON J. WHITEMORE



WRITER'S COMMENT: For this UWP class, Professor Moore challenged each individual writer to craft a unique feature article that offered insight into an important issue through a specific angle. Not only was my piece on the justice system a culmination of the work I had done throughout the quarter but this piece is a peek into both the passion projects. I have had the opportunity to work on within the criminal legal system and the incredible people I have been exposed to who have been directly impacted by the system. For several weeks during the drafting process of this piece I debated how I wanted my readers to feel after reading my piece. Ultimately, the feeling of accountability became something I saw as crucial in a tender piece such as this. I yearned for readers to flip the last page of my work and feel that in some sense, they have it within their own power to make an ounce of difference in the already corrupt legal system for minorities and underrepresented groups.

INSTRUCTOR'S COMMENT: With the weight of so many injustices currently circulating in our worlds, ethical and critical journalistic voices are needed more than ever. When working alongside Madison while she developed a feature-length article on the inequities of the U.S. justice system, I am reminded that those ethical and critical voices cannot be without empathy, care, and compassion. As a pre-law student, Madison has developed and crafted an approach to investigative journalism that coincides with her passion for others whose privileges do not coincide with her own. Oftentimes, as writers, we are tasked with giving voices to those without consistent or reliable I

access to information and resources, and Madison's writing and work in our course reflects an awareness of how to navigate these complex and nuanced issues. Reliability, in a world of mis and disinformation, proves a constant struggle. However, her feature leaves us, the readers, with much to consider and act upon should we truly wish to do the ethical, diverse, and equitable work so many of us speak to.

- Alison Moore, University Writing Program

Exposed: The Ugly Truth About America's "Justice" System

How the ruptured justice system prioritizes punishment over rehabilitation – especially for minorities

On a sunny afternoon in late November, a young man stepped into the world beyond prison walls for the first time since 2016. The Woodland sun bathed him in warmth as he emerged from the Yolo County Superior Courthouse, where he embraced his father for the first time in nearly eight years and held his wife's hand, finally free from the confines of a gray-striped jumpsuit.

As Justin Gonzalez and his wife, Morgan, sat down at Black Bear Diner eating eggs and bacon for his first post-incarceration meal, to my awe Justin exclaimed, "Man, this is the best thing I've ever eaten," as he ate the mediocre American food. But in reality, this simple, pure, and oddly calm moment was the bright light at the end of a very dark tunnel for someone who had been shunned by society and wrongfully incarcerated for a crime he played no part in.

Justin, a 5'9 Hispanic man who grew up in Woodland, California, had experienced run-ins with law enforcement since he was 15 years old.

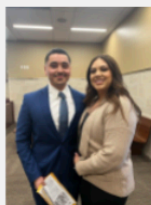
Living in a low-income and impoverished area in a deteriorating trailer with his family who worked hard but had little, Justin spent a lot of time running the streets of Woodland. Unfortunately, as a Hispanic, low-income teen, he fell into the hands of gang affiliation and was enveloped by a dangerous crowd of people at a young age.

In 2018, 19-year-old Justin was sentenced to 70 years to life in prison for a 2017 murder that he did not commit. Not only did multiple witnesses confess to lying on the stand during the original trial, but the District Attorney's Office was found entangled in a web of falsifying witness statements and using bribery as the means to coerce a witness into identifying Justin as the individual at the scene of the crime.

But still, despite the clear misconduct, Justin – an innocent man – spent the next seven years locked up behind bars. Finally, after he was granted a retrial in 2023, Justin walked free after being acquitted of murder in the Woodland courthouse. Justin is now a youth pastor in Oregon and has started his own non-profit organization for

helping impoverished youth who are susceptible to gang influence and exposure to the justice system.

Sadly, Justin is merely one example of an individual who has been ensnared by the broken tides of the justice system: he's one incarcerated out of the 2 million people incarcerated in the U.S. according to the Vera Institute and only one story out of the almost 200,000 people locked up in California prisons.



Justin and his wife, Morgan, after being released

Justice is not found behind bars, in striped jumpsuits, or in handcuffs. As it stands now, the justice system is heavily flawed and defective. Hundreds of people get locked up each day for offenses that require rehabilitation, not cruel punishment. Thousands of disproportionate racial biases lock up black, Hispanic, and multiracial people and overall, we lose thousands of valuable lives each year to this vicious cycle of punishment without rehabilitation efforts because of how our justice system fails the underprivileged and impoverished.

There's a lot of talk about things like "the new Jim Crow" and how racism is showing face in our modern world.

While skeptics highlight that segregation is no longer practiced and the U.S. welcomes diversity with open arms, the criminal justice system remains racially biased and fails to be as fair and equal as it preaches to be. Despite the fact that black men only comprise 12% of the U.S. general population, they comprise an astounding 35% of the U.S. prison population, according to statistics from the Prison Policy Initiative. What's more is that while only one out of 17 white American men become incarcerated, one out of six Latino men are likely to get incarcerated and one out of three black men end up behind bars in the U.S. There are two core reasons that reflect the relevance of these recent statistics. Oftentimes, minority groups and people of color like blacks and Latinos come from low-income communities, meaning that education is less accessible, they become exposed to more substance abuse issues, and therefore become more susceptible to contact with the justice system. Recent studies done by Stanford University have proven that there is a clear pattern between youth caught in the school-to-prison pipeline. In fact, "only 20 percent of California inmates demonstrate a basic level of literacy, and the average offender reads at an eighth grade level."

In addition to this school-to-prison pipeline prevalent in low-income areas, implicit and explicit bias thrive in the current justice system – strongly exhibited among authority

figures such as law enforcement officers and even federal court judges. In a recent 2023 case where Leon Liggins, a black man with known substance abuse issues from a low-income area was in court for a low-level drug possession offense, the judge sentencing Liggins stated, "he just looks like a criminal to me" when questioned by the defense attorney about why Liggins was being put behind bars for ten years instead of into a drug diversion program.

Bias also unjustly affects people of color before they're even in court, with law enforcement officers constantly stopping more people of color, noting that they're simply, "suspicious persons." In fact, studies across the country and over 35 police departments have revealed that black people are far less likely to be stopped after sunset when it is more difficult to determine a driver's race, according to the National Conference of State Legislatures.

Yet another faulty hinge of the criminal justice system lies in the U.S. juvenile justice system, where thousands of minors cycle through and oftentimes end up right back behind bars after having contact at a young age with the system.

In late March of this year, I attended a rally on the steps of the René C. Davidson Courthouse in Oakland where dozens of community advocates

stood proud on the courthouse steps, adamantly proving unwavering support to District Attorney Pamela Price's campaign promise to not charge juveniles as adults.

Several of the advocates included not only past offenders who had been thrown in adult prison and experienced first-hand the damage of this sentencing, but also women like Lorrain Taylor – who had lost both her children to gun violence from a juvenile offender. Despite this tragic loss, Taylor told me that juveniles should have the chance to "turn their lives around" through rehabilitation efforts, and not through the adult prison system which is "built for punishment." Other advocates such as Taylor highlighted the need for more rehabilitation options for juveniles struggling with issues such as mental health, addiction, and trauma "that likely brought them into contact with the system in the first place." In juvenile detention centers, youth are provided developmental and mental health programs for issues like depression, education, healthcare, and substance abuse. However, adult prisons notoriously face a grim disparity of resources with most failing to even provide sufficient living conditions and nourishment for their

"As a survivor, I have had to learn the difference between accountability and punishment. What survivors want is accountability. They want the person who harmed our loved one to take responsibility for what they did and take action to repair the harm" - Lorraine Taylor

incarcerees as well as exposing youth to intense physical and sexual violence.

While many think that the decision to try juveniles in the adult criminal system is purely a social issue based on the nature of the crime and not the person, the truth behind why the current justice system is so unjust and dysfunctional lies in the heart of science – specifically in neurobiology. The real question that skeptics should ask is, “Why are we holding minors to the same standards as adults when there’s a surplus of evidence that teens are more likely to make irrational decisions and ‘test the boundaries’ due to their prefrontal cortices not being fully developed?”

Part of the problem with incarcerating juvenile offenders as adults is that puberty-stricken teens notoriously have less impulse control due to the prefrontal cortex not being fully developed until the mid-20s. According to Doctor Bernadette Lim, a Harvard-trained expert in the science of adolescence and decision-making, “The brain’s frontal lobes, especially the prefrontal cortex, which governs reasoning, decision making, judgment, and impulse control are the last parts to reach full development in adolescents’ age.” When California’s justice system chooses to charge minors as adults, they’re blatantly turning their back against this evidence and exacerbating the already corrupt justice system.

I recently uncovered the story of a man named John Vasquez, who was tried as an adult as a teenager for attempted murder and multiple armed robberies. Vasquez was transferred to a maximum security prison where he served a 25-year sentence with no rehabilitation opportunities when he was just 16 years old.

Vasquez cited the adult violence he was exposed to at such a young age because of being charged as an adult. He even noted that while incarcerated, “One of the guards even told me, ‘hey youngster, do yourself a favor and hang yourself...you’re never going to get out of here.’”

“I was warehoused in adult prisons for decades” - John Vasquez

Reflecting on the lack of rehabilitation opportunities he was provided with and the trauma he had to endure, Vasquez said while holding back tears, “Just imagine what positive contributions I could have made if I were kept in the juvenile justice system and received the kind of treatment that all young people should be given to heal, thrive, and succeed.”

Beyond the assertion of why youth should not be exposed to the horrors of adult prisons which in turn, perpetuates more crime and committing offenses like sexual violence because of the exposure from prison, juvenile justice has an explicit intersection with

racial biases in the justice system too. According to 2022 studies by the Equal Justice Initiative, black youth are five times more likely, and Hispanic youth are two times more likely to be detained and sentenced as adults than white youth who committed identical crimes. More specifically, when looking at California counties, just in Alameda County alone between 2006 and 2018, an



A black youth being prosecuted as an adult, via www.unilad.com

astounding 97% of the youth who were prosecuted as adults were not white. In 2014, every youth in Alameda County prosecuted as an adult was black.

So what's next in this fight for actual justice? And by justice, I'm not referring to the facade the criminal justice system has been putting up that mimics accountability. Due to the complexity of this question, I turned to a renowned and inspirational person in the world of reformatory justice to help me shine some light on potential solutions that will help piece together the broken system.

Cristine Soto DeBerry is a former public defender turned progressive prosecutor who prioritizes justice reform. When I asked her why she became a prosecutor after spending five years as a public defender, Mrs. Soto

DeBerry stated, "This doesn't work. We're all just showing up here doing this thing that doesn't work and doesn't help people who clearly need more help than just being thrown behind bars."

Instead of punitive punishment, Mrs. Soto DeBerry and other progressive allies push for what she calls "upstream solutions"—solutions that are new, creative, and work to address a problem at its source.

These upstream solutions focus on comprehensive reforms including emphasizing and expanding the importance of education in low-income communities to decrease the school-to-prison pipeline, offering more access to mental health, drug abuse, and trauma resources through the allocation of state-level funding, supporting progressive DAs who are trying to keep children in the juvenile justice system and advocate against the death penalty instead of criticizing them for being too "lax" on crime and pushing them out of office, and working on educating the public to rewire their understanding of what "justice" and "accountability" truly mean in our modern world.

As we look to the future, the phrase "hurt people hurt [other] people," uttered by Avi Frey, a civil rights lawyer at the American Civil Liberties Union, lingers in my mind, its uncontaminated

**"Punishment alone is not going to solve this problem." -
Cristine Soto
DeBerry**

truth just now dawning on me. Initially, I didn't grasp the full weight of those words. Now, they occupy a permanent place in my thoughts, a lens through which I view the justice system. I wonder when these words will resonate at the core of our justice system and when society will recognize the harm inflicted on vulnerable, hurt, and underprivileged individuals through punitive measures.

GRANT PROPOSAL SUBMISSION TO THE NEA FOUNDATION: FLEXIBLE SEATING AND FIDGET TOOLS FOR ALL

ERIKA GEDGAUDAS



WRITER'S COMMENT: When instructed to write a grant proposal with the classroom and grade level of my choice, I knew instantly I wanted to base my project on disability justice in public schools. After several weeks of writing and revision, I settled on a proposal that requests accessible seating and fidget tools for elementary-aged students in the Davis area inspired by my time working in a local kindergarten classroom. Through my research, I learned about best practices for granting accommodations to entire classrooms, and my instructor Kelly Crosby was incredibly helpful in guiding us through the logistics of grant proposals and appealing to the education sector. Growing up without a formal diagnosis of my neurodivergence has prompted me to think deeply about universal access to accommodations, and I hope that someday in the future my proposal can become a reality, helping students in elementary and secondary classrooms at a local, state, or national level.

INSTRUCTOR'S COMMENT: When I was a high school teacher, I learned how to make do with what I had. I never knew about available grants, nor did I learn how to write a grant proposal. Now, I teach my students how to write those proposals so that when they are teachers, they can take great ideas and convert them into reality with support from funders. Proposal writing does very heavy lifting by informing and persuading readers simultaneously while maintaining direct, professional writing. Erika's proposal to the National Education Association (NEA) offers low-cost, simple interventions to complex challenges with how students learn and is uniquely attuned

to the needs of both teachers and students. Erika's grant proposal makes a very compelling argument to the NEA; their clear and vivid writing helped me imagine their classroom while reading. This is a project worth funding.

-Kelly Crosby, University Writing Program

Executive Summary

A 5th grade classroom at North Davis is seeking funding for flexible seating options and fidget tools in order to create a more accessible and comfortable academic environment. The objective is to increase students' self-regulation, agency, and comfort, which will be qualified through student feedback and educator observation. Incorporating flexible seating and fidget tools into the classroom is one small step toward addressing the principles of disability justice in schools. Funding in the amount of \$2,000 is requested to purchase flexible seating and fidget tools.

Description of Need

North Davis Elementary is located in Davis, CA. Twelve percent of its student body are provided Individualized Education Plans to serve their disabilities (North Davis Elementary School, 2021). This means that approximately three students in each classroom have a disability and may be provided accommodations.

However, while some students receive formal diagnoses, many students exhibiting symptoms of neurodivergence are not offered the interventions they need: an estimated one in five students diagnosed with attention deficit and hyperactivity disorder (ADHD) receive no school supports (Samuels, 2019), and an estimated one in four students with autism spectrum disorder (ASD) are never diagnosed by a community provider (Zahorodny et al., 2023). Without equitable access to flexible seating and fidget tools, undiagnosed students may suffer from fidgeting or

discomfort. This project's goal is to make resources available to all students, creating an inclusive and just learning environment.

Project Description

Goals and Outcomes

Adding sensory devices and flexible seating to my classroom will improve student comfort and agency in the classroom. This will promote the self-regulation branch of social-emotional learning, as students will learn to understand when and why they need sensory supports.

Providing resources to all students, regardless of their level of need, will create a classroom adhering to the principles of Universal Design for Learning. In other words, by incorporating accommodations for students with the most need into a general setting, students with less need can benefit as well.

Student success will be shown by students' comfort and level of agency in the classroom. Success will be measured through qualitative observation and student surveys regarding the following questions: Do students feel more comfortable using flexible seating? Do students feel like active participants in the classroom? Do students, regardless of their neurocognitive status, feel they benefit from access to fidget tools? Can students regulate themselves more easily?

Surveys will be completed periodically to gauge responses. If individual and collective student responses are positive, the project outcomes will be deemed successful. If student responses are negative, the project outcomes will be deemed unsuccessful and will require reevaluation based on students' expressed attitudes.

Values

The NEA Foundation demonstrates responsibility to and passion for public education, something I hope can positively

influence my classroom. Much like the NEA Foundation, my classroom values justice, partnership, and child-centered learning. My 5th graders and I can construct an authentic partnership and equitable classroom environment with NEA's support. By implementing alternative seating, students will increase their autonomy and learn to make informed, responsible decisions. By implementing sensory devices available to all, students will feel included and unashamed to use supports.

Because many students are not formally diagnosed in their youth, inequities persist in resource distribution for students with ASD and possible co-occurring diagnoses like ADHD or anxiety disorder (Zahorodny et al., 2023). Giving students alternative seating options and the freedom to use fidget tools as needed is one important step towards achieving disability justice in the classroom. Sustainability, interdependence, and collective access are three principles of disability justice I hope to address by incorporating flexible accommodations into the everyday classroom environment (see descriptions below; Berne et al., 2018). Students with disabilities should not feel as though their needs are extra accommodations; instead, the classroom should accommodate the entire student body.

Sustainability: If student feedback is positive, alternative seating and fidget tools will be available long-term. Students will work together to keep their resources in good condition so that future classes have the same resource availability.

Interdependence: Students will rely on one another's abilities to keep this project running. They will learn to work together by creating their contract and sharing responsibility over classroom resources. They will learn to share resources equitably to create a healthy classroom community.

Collective access: No student will be denied use of alternative seating or fidget tools long-term. Every student having access destigmatizes preference for alternative seating and reliance on fidget tools.

I aim to create an environment that meets each child at their level and encourages engagement. Allowing students to use supports unquestionably creates an environment of equity—tools are available to all, reducing the stigma around asking for and using supports. Flexible seating and fidget tools will address disability justice by ensuring that supports are provided before they must be asked for.

Student Involvement

Students will collaborate on a classroom contract to implement and enforce rules regarding seating and fidget use. This will increase their autonomy and allow them to understand that their needs and boundaries are valued. Students will be responsible for taking care of provided seating and devices. The contract drawn up by the class will address next steps if seating or fidgets are damaged, leading to the outcome that students develop values of organization, respect, and collaboration.

Student agency is paramount to creating an environment of partnership and public good; fostering positive student-classroom relationships leads to a recognition of every student's worth. Students' sense of agency will be ensured through surveys where they may bring up concerns they have with the use of flexible seating or fidget tools. Their feedback will inspire changes that make flexible seating and fidget tools work for everyone.

Students' participation in the project—writing the contract, providing feedback, and using resources throughout the year—will slowly establish the three principles of disability justice noted above. The more actively students engage with the project, the more they will internalize values of sustainability, interdependence, and collective access.

Scope and Sequence

Flexible seating options include bean bags, soft seating stools,

stability ball chairs, and a collaborative desk with soft seating stools. Bean bags will remain near the library section of the classroom but will be available for students to use at any time; students will be provided clipboards or lap pads to work productively. Soft seating stools and stability ball chairs will offer students an alternative option if they feel uncomfortable using plastic chairs. Students working collaboratively (either out of necessity or for increased comfort) will be able to use a shared table with soft seating stools. The intention is for students to be able to choose which seating they use daily—meaning every student has a chance to try every seat—although this may vary by classroom contract. Traditional plastic chairs and singular desks will remain for students who prefer them.

Fidget tools include hand exercisers (weighted stress balls), marble fidgets, fidget rings, weighted lap pads, and fidgeting foot bands. Hand exercisers, marble fidgets, and fidget rings are all quiet, non-distracting hand-held fidgets that students can use with minimal visual stimulation. If students fidget with their entire bodies or need a grounding resource, they may access weighted lap pads. Students sitting in traditional plastic seating may use fidgeting foot bands which are placed around the legs of a chair and offer resistance for students with busy feet.

I will assess the project's success through monthly and semesterly surveys: monthly surveys will inquire how comfortable students are in their seating, whether any changes could be made, and whether any problems with fidget toys have occurred; semesterly surveys will inquire whether students feel they generally benefit from alternative seating and access to fidget toys. As the educator, I will conduct qualitative assessment based on daily observation to track students' potential increase in self-regulation and agency.

Opposite is the project timeline:

*Grant Proposal Submission to the NEA Foundation: Flexible Seating
and Fidget Tools for All*

Phase	Action Items	Assessment
Summer	<ul style="list-style-type: none"> -Purchase flexible seating and fidget tools -Design classroom to accommodate new seating -Organize fidget tools -Create materials informing students and parents about proper use of new resources 	
Fall Semester	<ul style="list-style-type: none"> -Create classroom contract -Perform monthly surveys -Implement changes based on student responses to surveys 	<ul style="list-style-type: none"> -Perform semesterly assessment to gauge student interest, engagement, and comfort -Observe students to note and discuss potential changes
Spring Semester	<ul style="list-style-type: none"> -Perform monthly surveys -Implement changes based on student responses to surveys 	<ul style="list-style-type: none"> -Perform semesterly assessment to gauge student interest, engagement, and comfort -Observe students to note and discuss potential changes

Potential challenges include students becoming distracted by fidget toys, students quarreling over seating options, or students finding certain seating uncomfortable. If these obstacles occur, the classroom contract will inform consequences for fidget toy distraction and remedies for seating conflict. This will create a collaborative and responsible learning environment. Traditional seating will remain an option for students who find alternative seating uncomfortable. Students are responsible for maintaining

the seating and fidget toys, and degradation of resources will be a point included in the contract to determine which restorative measures are appropriate.

Funding

I am requesting \$2,000 to fund flexible seating options and fidget tools for my classroom. Flexible seating will include three bean bags, a seven-piece foam seating set, a rectangle activity table with butterfly seating (stools), and stability balls. Fidget tools will include stress balls, weighted lap pads, fidget foot bands, marble fidgets, and fidget rings. Reasoning for each item is available above. Below are the breakdowns for each section of the budget. Each product comes from a quality-assured provider trusted by educators; research has been conducted to find an appropriate balance between cost and quality.

Flexible Seating

Item	Cost (per one unit)	Cost (all units)	Total
35" Bean Bag (x3)	\$167.00	\$501.00	\$501.00
Foam Soft Seating Crescent Set – Seven Piece (x1)	\$401.88	\$401.88	\$902.88
Rectangle Activity Table with Butterfly Seating (x1)	\$587.98	\$587.98	\$1,490.86
Balance Stability Ball Chairs – Set of 6 (x1)	\$169.00	\$169.00	\$1,659.86

Fidget Tools

Item	Cost (per one unit)	Cost (all units)	Total
THERABAND Hand Exerciser (x6)	\$10.95	\$10.95	\$65.70
Weighted Lap Pad (x5)	\$38.23	\$191.15	\$256.85
Fidgeting Foot Bands - 10 Pack (x1)	\$48.99	\$48.99	\$305.84
Marble Fidgets - 10 Pack (x1)	\$6.50	\$6.50	\$312.34
Fidget Rings - 10 Pack (x2)	\$13.90	\$27.80	\$340.14
Total			\$340.14

Project Total

Flexible Seating Total	\$1,659.86
Fidget Tools Total	\$340.14
Project Grand Total	\$2,000.00

Sustainability

My classroom will sustain this project over time via classroom contracts that enforce resource upkeep standards. Standards within the classroom contract may include, but are not limited to: (a) Students must use resources as intended; (b) If students do not use resources as intended, they will be asked to put the resource away for the day; (c) If students stain, rip, break, or damage the resource in another way, it is their responsibility to communicate this with the teacher to find a solution. Extra fidget tools will be stored in case available tools become unusable (from factors like overuse,

nonstandard treatment, or degradation over time). Contracts will have a baseline set by the educator in the classroom and will be reviewed with every new class to give students a hand in creating and enforcing rules.

I intend to collaborate with parents of the classroom and the school's Parent Teacher Association (PTA) to develop my project. Parent collaboration will be realized by informing families about flexible seating and fidget tools, including what responsible use of these resources looks like. Families will gain knowledge of what their student's everyday classroom looks like and what expectations are in place. This will also help them be more comfortable knowing what kind of environment their student is learning in. The school's PTA will be notified about my project to potentially expand its scope after one year's success. Should student feedback be positive, I will work with the PTA and teacher colleagues to organize flexible seating and fidget tool distribution to other classrooms at North Davis Elementary. Doing so extends the longevity of my project and would benefit more classrooms.

Innovation

Incorporating flexible seating and fidget tools into students' everyday classroom experience will foster a classroom culture of equity, awareness, and responsibility. Furthermore, giving students the option to regulate themselves is important for increasing their sense of agency. A study conducted in 2018 found that when given a choice between traditional seating and stability balls, students were split on the balls' helpfulness. Some found that using stability balls was distracting to their learning, despite others using them as tools to increase engagement (Schoolcraft, 2018). Thus, I have opted to retain some traditional seating in my classroom; students should be allowed to make a choice based on what learning style works for them. My project will also instill a level of trust between the students and me, as I offer them the responsibility of creating a contract, submitting feedback, and maintaining their resources.

*Grant Proposal Submission to the NEA Foundation: Flexible Seating
and Fidget Tools for All*

This collaboration communicates that they have an important role in the classroom.

My project will create a universally designed learning environment; creating flexible environments makes learning more accessible (Goodwin University, 2022). Allowing students to learn in their most comfortable environment conveys that their needs are respected and that accommodations are nothing to be ashamed about. Designing my classroom to address several principles of disability justice is the first step in ensuring that no student is left behind, and that my universally designed classroom is truly just.

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A PROFILE

NINA HOSSEINI



WRITER'S COMMENT: Through my youth, I often found myself with draft after draft of unfinished fictional stories. I've always loved the idea of creating my own narrative on my own terms, allowing my writing to bring to life the stories I've envisioned in my head for so long. However, as the years went by, my writing became increasingly academically focused. I was no longer letting my creativity flow, no longer conjuring up characters and ideas that made me want to reread scenes simply because of how much they excited me. Academic writing can be fulfilling, especially when you receive positive feedback from professors, but its rigidity and structure can drain the excitement and comfort writing usually brings, especially for someone like me who longs to write creatively. Taking UWP101 with Professor Abramsky was pivotal in rekindling my love and joy for writing the way I want - freely and passionately. He opened my eyes to the world of profile writing, a genre I had never explored before. Although this story isn't fictional, I found myself learning once again how to craft a real-life situation into a narrative on my terms, without adhering to a rigid structure. This profile is about someone I know personally and someone I am proud to call a friend. I am glad that, of all my papers, Professor Abramsky encouraged me to submit this piece in particular, because there is no one more deserving than Wais to have his story be recognized.

INSTRUCTOR'S COMMENT: I am writing to introduce Nina Hosseini's extraordinary profile of a young Afghan man struggling to express himself as an artist despite -- or because of -- his suffering from

muscular dystrophy. Nina's profile, written as an assignment in the UWP 101 class that I teach, struck me from the very first as both intensely ambitious and also lyrical in its descriptions. She aimed to cover a large amount of ground, both in terms of external descriptions, but also in terms of the emotional canvas on which she crafted her writing. As the piece progressed through several edits, it grew in quality and in scope. Over the years, I have read hundreds of profiles written by students. None exhibited the maturity of the sensitivity Nina conjured up in this writing. It opens up for readers a hidden world, and one that I feel confident they will delight in accessing. That Prized Writing selected Nina's work for publication is, I believe, a strong decision. It will allow readers from around the university to experience the wonders of this story and of the life she has portrayed.

- Sasha Abramsky, University Writing Program

In the quiet sanctuary of his room, Wais sits amidst a gentle cascade of sunlight, highlighting his warm, tanned, skin. His fingers are poised delicately over a sketchbook. With each flip of a page, he breathes life into the characters that dance across the page; a lion, a stranger's face, European streets, anime characters that he particularly takes a liking to. The bright orange shade of Naruto's jumpsuit, a favorite character of his to draw, matches his own shirt that he's sporting. Wais has always been quite particular about the brands of clothes he wears. He prefers to always appear presentable and clean. His short brown hair is cut regularly and styled parted to the side. He's a bit shy, a bit quiet, as he slowly flips through the pages. Objectively, each sketch and drawing becomes more beautiful than the next, but in his eyes, he sees only what he's missed, and what he could have done better.

"This one isn't really good. I had difficulty in class painting nature because of the paintbrush," he says, humbly. He goes on to explain that such a painting required a deep understanding of light, shadow, texture, trees, and landscapes. Despite his frustrations with the outcome of his work, there is no doubt that art has become Wais' favorite hobby. In a world confined to his own body, sitting on a chair with wheels that serve as legs, there are only a few things he can do. I might not be able to walk around and do sports and be part of that," he says, "but I'm more able to

focus on my feelings and drawings. I pay attention to every little thing to create art that can express my feelings.”

Wais wheels himself to the bus stop on some mornings, managing to take the bus to college. With each class attended, and each assignment completed, he inches closer toward his lifelong dream of becoming a graphic designer. His passion for art is nurtured by the unwavering support and encouragement of those around him, which only fuels his desire to succeed against all odds. His determination and passion for art stemmed from his early childhood in Kabul, taking his first art class in the fourth grade. But Art isn't his only passion. Wais is a business oriented and career driven individual. Whenever he learns something new he thinks of all the ways he can expand on his knowledge and skills for business. There were times he thought about making professional birthday cards, and there were other times he taught himself about clothing design, taking every new skill as a potential for future opportunity. But lately, he's been getting weaker. And as his body weakens, and the paralysis takes more and more from his body and begins to numb his arms, a business idea dwindles, gets put to the side.

What Wais suffers from is Duchenne Muscular Dystrophy disorder, also known as DMD. Over time, he loses his strength. His parents would describe his upbringing as a toddler as normal. He was just like any other child in the beginning. He loved to play, loved to run around and get his little feet dirty. He loved to try new foods and candies, and still does, although now he cares more for watching his weight. His family have quite a number of memories of him taking food and sneaking it somewhere, and silly things of that sort. Overall, he was a happy child.

Over time, though, he began to walk at a slower pace. He'd become clumsier, shakier, and was beginning to be much weaker in strength than any other child his age. He was a bit flimsy, he'd easily fall over. His family first thought that he might just be a lazy boy, especially since he'd preferred to be picked up until he was 8 years old. Around that age, he'd completely stopped walking, and that's when he got tested and diagnosed with DMD. He's been on a wheelchair ever since, and has lost much more strength as the years have passed. The doctors told Wais' family that he would only live up to his 20s. He's 24 years old now and, despite his medicine, he continues to lose more strength, albeit at a much slower rate now.

Life didn't just change for Wais after his diagnosis. The lives of

his family members significantly changed as well. He needed primary caretakers for all of his daily tasks; from lifting him, changing his clothes, showers, to using the restroom, doctors' appointments... they do it all. His parents cannot just leave him alone, and they cannot go anywhere that isn't ADA accessible. They can't travel far because they'd have to make sure there is accessibility and space for his electric wheelchair, and even airplanes are limited by ADA. Because of this, they mostly stay at home or visit nearby cities, and they can't take Wais to visit all their relatives, especially if they live in a two-story apartment.

On the day of his brother's Graduation, an event that was a big deal for the family as he was the first to earn his degree, Wais wasn't able to be there. The seats bought at the golden one center were simply not accommodating to him. When his brother's ceremony was over, he didn't want to head for celebratory dinner, or attend an after party. The first thing he did was go to his little brother, to take all of his flowers and balloons to him, to let him see him in his cap and gown. Wais not being able to be a part of one of the most special days of his life weighed heavily on his heart, because there is no one else he knows who'd be more proud, and no one else he'd want to stand next to at that pivotal moment. Such is the life for Wais; an endless loop of yearning and missed opportunities of memories and shared experiences of everything he loves.

If you would have asked his mother before their migration, she would say that his future would be quite bleak, a lot different than it is now in America then it would have been back in Afghanistan. There were really no opportunities there because of the situation at the time. It was hardly a convenient place for the able-bodied, let alone a place that had amenities for disabled people. They can't go around with a wheelchair or do much of anything. Mostly, people like Wais will stay at home and watch television. But here in the States, he is able to expand his art despite being in a wheelchair. Wais wasn't fond of a life in Afghanistan, nor is he entirely fond of a life of sitting at home, with nothing to do besides playing video games and watching movies, which he likes to do when he's not being creative. He dreams of being able to take himself on a drive, to explore the outdoors on his own, go solo camping somewhere and enjoy nature, or even just to take himself to a movie theater, which is one of his favorite places to visit.

Around lunch time, he wheels himself to the kitchen, where his father has a plate set out for him. He feeds him with a spoon, some

rice and chicken. Wais is evidently embarrassed by the fact, but there is nothing he can do.

Wais will tell you about so many things, but rarely is he heard speaking of his condition. He doesn't want to be seen as someone who's disabled, especially when he is around people his own age. He'd much rather prefer being around people young enough to not tire of playing games with him out of pity or to keep him occupied. That's why he loves it when friends like the brothers of his sister in law decide to visit to play rounds of fifa, watch movies, and eat snacks. Wais, however, tries not to ask too often for these visits, not because he doesn't love having people over, but because he doesn't want to pester them about having to come hang out. He thinks that it should be something they want to do, and not something they feel they need to do. And when his friends do visit, there tends to be a part of him that only wants to please them. They can choose any kind of movie, or any kind of video game, and he will say that he's having fun and enjoying all of it, regardless of whether he really likes it. If he wins in a game of fifa, Wais isn't the kind of person to boast about it or celebrate himself outwardly. Instead, he tells the loser that he did a really good job, too.

Because of his wheelchair, he tries not to bother others, take up much space, or get in anybody's way. He even fears entering someone's house and having his wheels dirty their carpet. He's known to be quite cautious about things like that. When speaking to the brother of his sister-in-law, he spoke with melancholy about the time he went camping with that side of the family for the first time. Wais' brother had gotten up early on the second morning of the trip and left Campville, an area where the family camps every summer, back to the city to bring Wais. When he arrived, everyone was happy to see him. But as he recalls that fond memory, he remembers how Wais would constantly try to get out of everyone's way, in case they wanted to walk past. He remembers him having barely eaten anything at all, despite the many times he was offered. "I'll eat later, I'm not very hungry", he'd say. But those close to him knew that it was because he wanted to avoid having to use the restroom and burden his own brother with having to help him use it. Instead, he'd sit out in the shade, below the trees and watch everyone else swim in the lake.

"He's very kind. Very kind. One of the kindest people I know," a friend says. People tend to say that about a lot of people they're close with, but this is an absolute truth when it comes to Wais. He's not the kind of

person that says a lot, but anyone who spends time in his presence can feel it. Wais is known for being someone who tends to look after everyone else's comfort before his own. He tries to make sure that his guests are having a good time, and even keeps a drawer full of snacks that he knows certain people will like just so they can have them when they visit. Back in high school, when Wais was eligible for a Make-A-Wish, he chose to take his family on a trip to Europe to visit relatives abroad, rather than make a wish he wanted for himself.

His sister-in-law has always been particularly fond of him. They met years ago when she first started dating his brother. She recalls Wais being very shy and quiet at first. "But he's my best friend," she says. "I can tell him everything, knowing that I have his full support and understanding. If I have any familial conflicts, I can go to him and know that he will always understand, and will even tell me stories that will calm me down, and immediately I feel a lot better after talking to him."

Wais' brother and sister-in-law can't be away from the family home for too long in case Wais' parents, who are getting older, might need their help. The family purchased a home this year in the same neighborhood as the newlyweds, so that they are always on call in case anything happens. Wais' brother had gone through a long bout of depression that he hadn't realized, constantly thinking about the day he had to hear the bad news. He thinks about how he's able to go to the gym, and have a normal, healthy, life, whilst his little brother can't even put his own spoon in his mouth. He asks God why he made it this way. His wife, on the other hand, sees his family when they're smiling, and happy, and often, against her own wishes, pictures the moment that Wais is gone and tries to imagine his family in that situation. Although they always say they are prepared for the day, she doesn't think that they really are.

They've had such scares before. When Wais was 18, he was hospitalized. The doctors at the time said that due to years of sitting badly back in Afghanistan, his spine had begun to push forward toward his heart, and they had to do an emergency surgery on his spine to straighten it so that it wouldn't push forward into his heart and ribs. It turned out to be a long surgery, and at some point during the operation the doctors contacted his father and revealed that due to the intensity of the surgery, there was a high chance that Wais wouldn't be able to make it and asked if they would sign to continue or not and agree that the doctor's bear no responsibility for the risks. At that moment, his father decided to trust

in God and move forward with the surgery. In the end, they were able to screw his spine all the way from the bottom to his neck, effectively straightening it back to its more natural position.

He had lived, and hope for the family was alive. Most important of all, though, was the hope that sprouted in younger Wais. Because he was special. He survived. God kept him alive for the very reason that he has something to offer to the world. And so it wouldn't be a futile thing to keep dreaming, and creating, and believing in all of the things he could do and achieve despite his condition.

And so today, amidst all of the adversity and pain, Wais remains grounded by his values of humility, resilience, and determination. Interactions with him are marked by a gentle sincerity, and a reminder that a wheelchair for him does not actually serve as chains, but a foundation of creativity. Where others see a lifetime of limitations and challenges, Wais sees an opportunity to pour his emotions onto paper with a stroke of a pen.

CITIZEN SCIENTISTS IN BIRD RESEARCH

YIFANG ZHANG



WRITER'S COMMENT: One of the assignments for my UWP 104E class was a paper explaining a scientific matter to the general public. As someone who had just become a birder a few months prior, I decided to use this opportunity to further educate myself about the famous eBird app, a platform through which lay community members can log their bird observations for their own personal records as well as provide useful data for ornithological research. Being an aspiring ecologist, I wanted to better understand the potentials of citizen science. In my ecology and conservation biology classes, I had heard about how beneficial citizen science projects are, but I didn't know about any specific examples of the application of eBird data. This assignment was the perfect occasion for me to read about concrete examples of citizen science contributing to scientific advancement and to tell more people about the fun and rewarding experience of being an eBirder.

INSTRUCTOR'S COMMENT: Our winning entry was produced in a popular course, Writing in the Professions: Science, which has become a specialty of mine, although I often wonder how. I have the same occupational shortcoming we all do in UWP: we were all English majors as undergrads and did the same thing in graduate school. Our students, by extreme contrast, are into scientific research so advanced and baffling that when I teach the course, I have that song from the 1980s, Oingo Boingo's "Weird Science," in my head all quarter long.

When Yifang proposed the topic of what is now her winning essay, I was relieved, because here was a subject I at least knew a little about. Then it got more complicated, and as I started reading her paper, I despaired...and then she kept explaining, and I got over it. "Citizen science," mobilizing the general public to cast a wider net in observational sciences, is crucial to recent developments in ornithology, the subject of her paper. What she is describing here—crowd-sourced monitoring, powered by high tech—is in fact the cutting edge of her science. Cutting edge or no, she did such a wonderful job explaining that Oingo Boingo at long last shut up.

- Scott Herring, University Writing Program



*Figure 1: Great Horned Owl,
Courtesy of USFWS - Pacific
Region*

It was on January 20, 2024, at exactly 5:37pm, when I saw a great horned owl land on top of the Art Building on campus as I was walking to my car after a day of studying at the library. I took out my phone, opened the eBird app, and logged my sighting of this bird, all without hesitation. I hadn't seen an owl for months, and running into one at a place I walk by almost every day was an event too exciting for me not to record.

When talking about cutting-edge science, people tend to picture astrophysicists observing galaxies using telescopes the size of a building or biochemists looking at the function of a single carbon atom in the body under microscopes; there are ways, however, in which the public can contribute to new scientific discoveries without the use of telescopes or microscopes. The term "citizen science" describes the process of people with minimal or zero training acting as citizen scientists working alongside trained researchers or individual volunteers to collect

scientific data. Among various scientific disciplines, ornithology has led the way in using citizen science data, because birds are relatively easy to observe and bird watchers are all potential citizen scientists trained in recognizing and recording birds they see.

eBird is a database created by the Cornell Lab of Ornithology where anyone can submit checklists of birds that they have seen, whether during an early-morning bird walk or sitting on the couch watching birds feasting at their backyard bird feeder, and these data can be used by researchers to

understand and investigate bird distribution and movement. On the official eBird website, Team eBird—the group of researchers behind the project at Cornell University—describes eBird as a platform where birders can “Record any bird you see, from anywhere and any time, then explore where the birds are!” Birders can upload information about the species, number of individuals, location, time of day, sound recording, photo, or any other details in their checklist using the eBird website or smartphone application, and the information is stored in the eBird database for anyone to access. Since its conception in 2002, the eBird project has collected over one billion bird observations from across the globe, which have been incorporated into hundreds of scientific publications according to the eBird website.

Rick Bonney, an ornithologist at Cornell University, was one of the first people to use the term “citizen science” to describe the contribution of the public in scientific research. Bonney describes, in an article published in the *Living Bird* magazine in 1996, how, “as thousands of birders participate in bird censuses, surveys, and research projects across the continent, amateurs have gathered a treasure house of information.” Since then, citizen science has

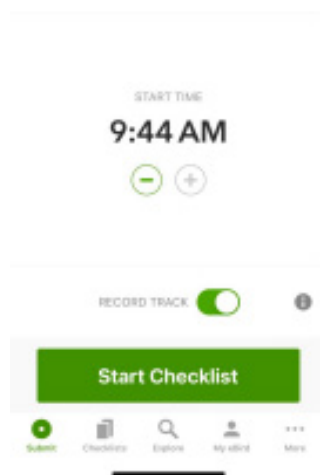


Figure 2: home page of the eBird app

only become more popular, especially among environmental and conservation biologists, because of its ability to generate large amounts of data from the collaborative efforts of enthusiastic community members. In the same article, Bonney even goes so far as to state: “It’s safe to say that the [Cornell] Lab of Ornithology depends on amateurs to collect data,” and this statement is not

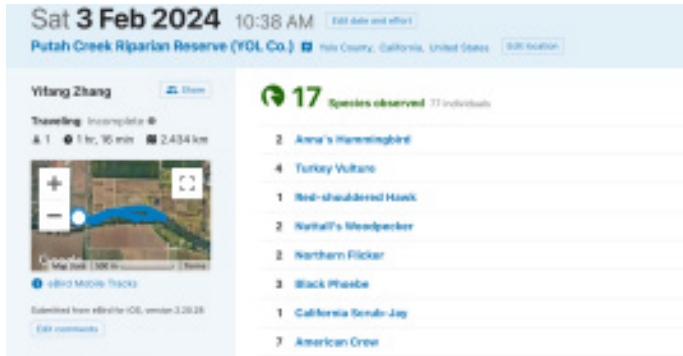


Figure 3: one of my checklists on eBird

exaggerating the contribution of citizen science in ornithological research.

For example, in 2020, Dr. Tim Coleman, now a data scientist working at Google, worked with a team of ornithologists from the Cornell Lab of Ornithology to study underlying causes to varying tree swallow (a common insectivorous bird throughout North America) migration patterns in the eastern US. Using sightings of tree swallows that birders have reported on eBird, Coleman and his team were able to conclude that daily maximum temperatures predicted the distribution of tree swallows during breeding season; they found that tree swallows preferred regions with warmer temperatures. This discovery can help researchers better predict the distribution of tree swallows and protect them, which is especially valuable in today's world where climate change and human activities both heavily impact wild birds.

There are other examples of eBird data contributing to scientific advancement. In an article published in the journal *Methods in Ecology and Evolution* in January 2023, Miguel Fuentes—a PhD

student in computer science at the University of Massachusetts Amherst—and a team of researchers from the Cornell Lab of Ornithology introduced a statistical model named BirdFlow. This model was established and tested using data on the distribution of multiple species from eBird, and it can track and predict bird movement patterns of any species based on existing eBird data. With this new tool, researchers can study and predict bird migrations between seasons or due to climate change and human activities; it can even be used to track the spread of contagious diseases such as avian flu. So far, this model has only been applied to birds, but it is a promising statistical tool that can, as the researchers state in their article, “unlock troves of citizen science data for use by... researchers and conservation practitioners.” Understanding and anticipating animal migrations is essential to successful wildlife management and conservation plans, and tools such as BirdFlow can help protect beyond just tree swallows or birds but other organisms.

A common worry surrounding citizen science is its reliability, because on platforms such as eBird, a large proportion of the data come from people with limited or no professional training in the field of study, surveying birds in the case eBird. Naturally, this can cause inconsistencies in data quality. But as Dr. Jenny McKee, an ecologist at the University of Wyoming, suggests in a beginner’s guide to using eBird in the Audubon Magazine, “cut yourself some slack if you missed a bird or two or weren’t able to ID everything you found,” because “What matters is getting the right order of magnitude.” In other words, scientists are more interested in large-scale and general observations when using citizen science. Instead of relying on birders to determine if there are 4 or 5 nestlings in a western yellow-billed cuckoo (an endangered bird species of California) nest, scientists expect birders to report whether there are around 10 or over 2000 ducks in a pond.

Furthermore, inconsistencies in citizen science data can be minimized by carefully considering how and where to incorporate these data. After reviewing academic publications from a wide

range of disciplines, Dr. Eréndira Aceves-Bueno and her team from the Bren School of Environmental Science & Management at the University of California, Santa Barbara recommend that scientists “be explicit about their criterion for determining whether the data are ‘good enough.’” This way, fellow scientists can consider the level

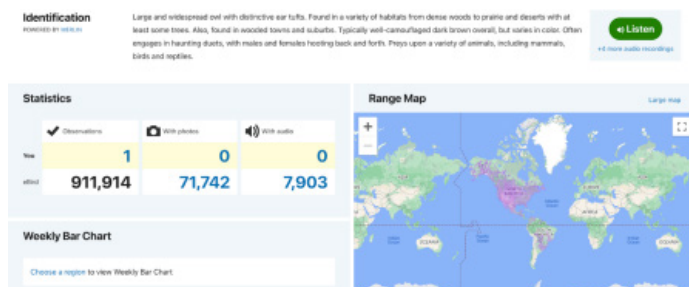


Figure 4: statistics of great horned owl observations on eBird as of Feb. 13, 2024

of accuracy when referencing the results of a citizen science-based project in the future, and further studies can be more properly designed to confirm and expand upon these results.

In his article published in the *Living Bird* magazine, Rick Bonney writes: “citizen science is a two-way street,” because citizen scientists develop scientific skills (identifying and systematically reporting birds in the case of eBird) and “gain the satisfactions of furthering scientific knowledge.” With the help of eBird, birders can brag about seeing a cool bird to their fellow birders as well as feel good about logging their observations to help advance ornithological research.

My eBird checklist of the great horned owl sighting is proof to myself and my friends that I saw an owl, but it is also one of the 911,914 great horned owl observations from across the Americas in the eBird database. Should any ornithologist want to study great horned owls in the future, they will be able to find out that one landed on top of the Art Building on the campus of the University of California, Davis on January 20, 2024 at 5:37pm.

MDMA: COULD YOU USE IT?

JOEY WU



WRITER'S COMMENT: In all earnestness, I don't like reading, and I don't like writing. Reading a textbook was so arduous that I managed to not read a single chapter until my junior year of university. I took this writing course because it would help me through the medical school application process, but I dreaded the assignment that entailed reading a slew of scientific research articles I did not want to read. However, writing can be made into art, and art requires inspiration. I thought about my new online friend from Australia, Arabella. One of our first conversations was about how she was autistic and managed her social anxiety with MDMA. As your typical uneducated American, I was surprised by her indifferent admission to using a Schedule I controlled substance. She was a woman in PHLEM (Philosophy, History, Literature, English, Music), and I was a woman in STEM (Science, Technology, Engineering, Mathematics). Her "eccy rants," as she put it, intrigued me, and I wanted to find out what in the (chemical) world she was talking about.

INSTRUCTOR'S COMMENT: Written for her Writing in the Professions: Health class, Joey Wu crafts a fascinating popular health article about the use of MDMA for autistic adults in her "MDMA: Could You Use It?" In it, she highlights how she first learned about the uses of MDMA from her online friend Arabella and takes readers on a journey to showcase the therapeutic benefits the Schedule I drug has to offer. Framing her article around Arabella's experience using MDMA, Joey is able to demonstrate to readers the positive effects of MDMA for those suffering from PTSD as well as autistic adults and demon-

strates that the “entactogen” is misunderstood in large part because of its association with MDA. Drawing parallels with other drugs like ketamine, Joey shows why regulation instead of criminalization is so important when it comes to drugs like MDMA and gives a voice to people who actually benefit from its usage.

- Jillian Azevedo, University Writing Program



Photo: Drug Enforcement Administration

“I love MDMA. That sh*t’s the bomb,” was one of my first conversations with my new online friend, Arabella, in Australia. “You’ve taken it? What’s it like?” I asked. When you meet someone new, you have to balance holding your preconceived notions with being open to receiving someone else’s experiences.

“Literally the feeling of pure ecstasy. Everything feels good, sounds good, tastes good. It’s like floating.”

“Are there negative side effects to it?” My preconceived notions are balancing.

“I was so disgustingly confident it was dangerous, [but] oh, the comedown the next day is brutal. I had full body shivers the next day.” Disgustingly confident? I was, too.

Arabella is also an autistic adult in her mid-20s, and MDMA helps her through overwhelming social events, whether that be a work party at her cool indie music industry career or a 3 am gathering with her close friends. At first, I didn’t understand the

relationship between MDMA and usage by autistic adults. Should I have been concerned for my new friend?

MDMA sounds awfully close to MDA and rightfully so: MDA is its parent. Both are substances usually consumed orally, and they are considered Schedule I Controlled Substances, defined by the Drug Enforcement Administration (DEA) as having “a high potential for abuse, no currently accepted medical use in treatment in the United States, and a lack of accepted safety for use under medical supervision.” Known for its hallucinogenic properties, MDA’s reputation bleeds into MDMA’s, despite MDMA being neither a psychostimulant nor a hallucinogen.

Rather, MDMA produces self-compassionate and prosocial effects, inducing a feeling of euphoria and openness to oneself and others. David Nichols, an Adjunct Professor of Chemical Biology and Medicinal Chemistry at the University of North Carolina, Chapel Hill, coined a new category for MDMA: an entactogen, a name derived from roots that mean “touching within.”

Why does MDMA get her own category? Is she not like other drugs? Studies suggest not. In fact, recent research suggests that MDMA could be used as a tool to assist autistic adults experiencing severe social anxiety as well as Posttraumatic Stress Disorder (PTSD) patients in psychotherapy.

Why Does Arabella Use MDMA?

The Diagnostic and Statistical Manual of Mental Disorders describes Autism Spectrum Disorder (ASD) as a person who experiences a spectrum of persistent deficits in social communication and restrictive and/or repetitive behaviors that can be expressed through routine motor movements and a hyperfixation of particular interest. As many as 1 in 4 people with autism experience social anxiety disorder for a period or an entirety of their lifetime.

Studies conducted on both mice and people by, respectively, Dr. Jessica Walsh, a Postdoctoral Research Fellow at Stanford University, and Dr. Alicia Danforth, a researcher and clinical psychologist at the Los Angeles Biomedical Research Institute,

demonstrated that MDMA decreases feelings of severe social anxiety.

Such scientific support inspires legitimate and legal applications of the entactogen. “We hope that our findings will stimulate further work defining the effectiveness of these simple, but potentially powerful therapeutic interventions,” says Dr. Walsh.

Legalization and regulation are of particular concern for my friend who said, “They made my beautiful MDMA dangerous here [in Australia].” Due to a lack of regulation, MDMA is commonly cut with fentanyl, a cheaper substance that is notorious for leading to the deaths of its unknowing users due to its high dosages and chemical interactions with MDMA.

Following the push by senators to be labeled a Schedule I substance in the United States in 1985, MDMA’s poor MDA-associated reputation has stalled the rate of research preceding legalization and regulation. Recent research demonstrates effective clinical use for those suffering from PTSD.

How could a Schedule I substance help someone already suffering from PTSD?

PTSD is a mental health disorder that affects people who have been exposed to traumatic events such as those related to death, serious injury/illness, and sexual violence. Those with PTSD may suffer from a slew of symptoms, including but not limited to recurrent distressing memories of the traumatic event, persistent negative moods and beliefs, and depression.

PTSD is currently being treated with selective serotonin reuptake inhibitors (SSRIs), but it has only a 35-47% efficacy in its patients. SSRIs have been reported to increase risks of major bleeding, suicidal tendencies, and sexual issues, and scientists are on the search for a more effective treatment.

Quantifying PTSD symptoms of participants through self-reports and their anxiety change scores, a study led by Dr. Philip Wolfson, the Director of the Center for Transformational Psychotherapy, focused on PTSD derived from patients who

suffered a life-threatening illness. His study showed that therapy, when assisted by patient usage of MDMA, decreased experiences of PTSD symptoms.

MDMA-assisted psychotherapy “may help people with [life-threatening illnesses] by reducing fears of disease recurrence or death and embracing compassion for self, others, and one’s situation,” says Dr. Wolfson

Dr. Wolfson’s preliminary research is further supported by studies led by Dr. Jennifer Mitchell, a professor of Neurology and Psychiatry & Behavioral Sciences at the University of California, San Francisco. Dr. Mitchell’s study found a significant decrease in symptoms that indicated severe PTSD and in the degree to which PTSD caused functional disability in daily life.

In addition to a significant alleviation of PTSD symptoms when MDMA accompanies therapy, Dr. Mitchell’s study even demonstrated a loss of diagnosis of PTSD.

Alcohol or substance abuse are commonly intertwined with PTSD as coping mechanisms. Dr. Christopher Nicholas, at the University of Wisconsin, Madison, led a study that demonstrated MDMA-assisted psychotherapy resulted in a significant decrease in alcohol use, but not drug use. This study holds preliminary evidence that MDMA may improve its patients’ quality of life in a multitude of aspects.

Is the Government Right?

An increasing amount of research in support of MDMA usage for social anxiety and MDMA-assisted psychotherapy challenges the DEA’s classification of the entactogen as a substance having “no currently accepted medical use in treatment in the United States and a lack of accepted safety for use under medical supervision.” And a misclassification can be a fatal one.

Recently, the world mourned the passing of Matthew Perry, well-known for his acting role as Chandler Bing in the American sitcom, *Friends*. After he was found in his hot tub on October 28, 2023, a toxicology report was released on December

15 that revealed that the short-term effects of ketamine, drowning, coronary artery disease, and buprenorphine contributed to his death. Matthew Perry was undergoing ketamine-assisted therapy to seek help for his treatment-resistant depression and PTSD.

The goal of ketamine-assisted therapy is similar to that of MDMA-assisted therapy. Patients are given these substances and monitored by a clinician, but Matthew Perry used ketamine off-label and unregulated, resulting in his accidental death.

“The off-label use of ketamine for chronic pain and mental health care, unfortunately, is a bit clouded at this moment, as there are not as many regulations and standardization around how this medication is provided, where the medication is provided and by whom,” says Dr. Amber Borucki, a clinical associate professor of anesthesiology, perioperative and pain medicine at Stanford University.

What does this regulation look like?

In Germany, the joint venture between HMNC Brain Health and Develco Pharma is developing “an oral prolonged-release formulation of ketamine...that could make it the first ketamine treatment for depression suitable for use at home.”

This oral version, called “Ketabon,” may allow its users to administer the drug in safe doses without the direct supervision of a clinician. A specifically regulated trait of note is that Ketabon is manufactured to have minimal dissociative side effects, “the property of ketamine that is most often sought by people using ketamine inappropriately,” said Dr. Hans Eriksson, the chief medical officer of HMNC Brain Health.

The MDMA-assisted psychotherapy-focused studies each noted that there was no evidence of MDMA intolerance or abuse while the patients were receiving controlled doses, potentially disproving the DEA’s distinction of MDMA having a “high potential of abuse.” It seems that, when MDMA is prescribed and regulated like Ketabon for ketamine, MDMA poses as a potentially legitimate drug for mental health treatment.

But there are still side effects, aren't there?

Of course.

As suggested by Arabella's description of "full body shivers" after a night of using MDMA, the substance does lead to side effects such as dry mouth, temporarily increased systolic and diastolic blood pressure and heart rate, nausea, headache, fatigue, fever temperatures, and poor mood. However, Dr. Wolfson's and Dr. Mitchell's studies noted that these symptoms were temporary.

Unlike the current PTSD treatment of SSRIs, MDMA participants did not report suicidality in terms of attempts or ideation.

Overall, MDMA is a substance worthy of being a possible adjunct to mental health treatment. Improved sociability allows its users to open up to those around them, and improved self-compassion allows them to be vulnerable to themselves and their therapists, speeding up the progress of their PTSD recovery.

The next steps should be further solidifying research with larger sample sizes to build the foundation for MDMA legalization and regulation.

But what if something goes wrong?

Something always goes wrong.

A point of contention is that all of these studies were conducted in a highly controlled environment with highly controlled doses of MDMA. Users will not always take their proper doses, so what if they take too much, resulting in adverse effects?

There's a substance that was studied as a possible Narcan for MDMA: *Withania somnifera* (WSE), an extract of an Ayurvedic medicine also known as Ashwagandha. WSE has previously been studied for its efficacy for conditions such as Alzheimer's disease, Parkinson's disease, cancer, rheumatoid arthritis, stress, and systemic inflammation. Dr. Giulia Costa, a researcher in the Department of Biomedical Sciences at the University of Cagliari, Italy, led a

study that found that WSE reversed MDMA's effect of increasing its user's body temperature.

This study could suggest WSE to be a possible "antidote" or assistive defense against the adverse effects of MDMA, should they occur. So, if you're still worried about MDMA, hold your horses.

Or maybe don't hold them too tight—this study is preliminary with a small sample size of 32 mice. More research must be done to investigate this substance's "anti-entactogenic" properties against the potential neurotoxicity of substances such as MDMA.

And when Arabella needs to shelter from reality, she takes a dip in MDMA.

I was initially skeptical of Arabella's advocacy of MDMA. My stranger danger instinct mixed with my preconceived notions made me suspect her as an anomaly. Severe social anxiety mediated by a Schedule I controlled substance? Write me a better creative short story.

But as I kept digging, I found more and more scientific evidence to explain her experiences. MDMA enables her to be more comfortable in her social surroundings as opposed to being constantly overwhelmed by the need to leave without the social context permitting her to. It improves her quality of life as an autistic adult, and it has the same effect on those suffering from PTSD.

Dr. Nichols emphasizes that MDMA "can lead to profound states of introspection and personal reflection," and besides this being useful for having an endless conversation that could go simultaneously nowhere and everywhere, this effect acts as a catalyst for so much progress in therapy.

Of course, there are side effects, and like everything else in the world, too much of something could lead to adverse effects. However, with every study, more evidence comes to support MDMA's role in medical treatment with limited potential for

abuse. Its relationship to MDA may not be enough for it to be correctly classified as a Schedule I substance.

Sometimes, you should believe strangers on the Internet.

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INVOLUNTARY IMAGINATION: APHANTASIA AND DREAMING

JAYCEE MACQUARRIE



WRITER'S COMMENT: I've been exhibiting creative tendencies since I was young, so the world around me just assumed that the imagination inside my head was equivalent to the expression I created in the real world. In actuality, the brainscape I exhibit is incredibly non-corporeal and dim, despite my love for all things colorful, animated, and stylish. When I initially discovered the concept of aphantasia, the realization, relief, and solidarity I felt was world-changing. I wasn't alone! I don't have a broken foundation, I'm just working with an entirely different infrastructure! Even though this solace is incredibly common among those with aphantasia, the rest of the neurotypical world has not been as responsive to our revelry. To this day, I still receive blank stares when I excitedly describe the condition, as if their luxury of a visual mind's eye has made them entirely impervious to creativity and empathy. This paper is dedicated to the aphantasic individuals, like myself, with ambitions and imaginations greater than the mind's eyes with which we live. Dream on.

INSTRUCTOR'S COMMENT: Jaycee did one of those things that students in my class do only occasionally, she blew my mind. I had never heard of Aphantasia before, and while I might have met someone with this condition, I would have never known how to even talk about it. Here Jaycee reviews our current understanding of the condition, the neural mechanisms that underpin it, and in a fascinating twist, the correlation between Aphantasia and dreaming. Probing recent research in neurobiology, psychology and the mind, Jaycee shares what we know and points at some of the gaps in our knowledge that future research

is working to fill. Without having worked with her, I would also never have been exposed to texts such as The Routledge Handbook of Philosophy of Imagination, one of the sources cited and discussed herein. Passionately written and genuinely engaging, this is one of those papers that helps illustrate how student-scholars can take what is ostensibly an assignment for a class and make it into a fascinating text that will take readers on a journey that teaches them something new, yes, but also reminds them of how much we just don't know.

- Russ Carpenter, University Writing Program

Abstract

Aphantasia is the phenomenon wherein an individual is incapable of producing sensory imagery, or produces reduced sensory imagery, within the mind's eye. Commonly, this is associated with a lack of visual imagery, hence the name, but the condition regularly impacts many or all senses. The disorder is typically diagnosed using the Vividness of Visual Imagery Questionnaire (VVIQ), but this has drawn controversy due to the unidimensionality of the evaluation. Aphantasia causes not just reduced/absent visual imagery, but impairment in multiple or all sensory modalities. Other symptoms include impairment in autobiographical memory and generating episodic events, both past and future, but not in spatial imaging of any kind. Proposals such as episodic processing impairment and lack of sensory imagination have been made to attempt to decipher aphantasia, but so far none of the promising theories have expanded beyond an individual research paper. Despite the phenomenon, many individuals with aphantasia report visual dreams, albeit significantly reduced. The likely cause of this dreaming is an involuntary state of imagination which convinces the brain that it is active. Said involuntary pathways are processed separately from active visual imagery, which explains the discrepancy in the aphantasic mind. Although merely a working theory, much of the current literature agrees

with this concept. Overall, while the cognitive mechanisms for both of these phenomena are yet to be well-defined, working to better understand the psychology of said phenomena will likely provide continual relief and explanation for those individuals who are diagnosed.

Intro: Accessibility to the Mind's Eye

The mind's eye is one of the most powerful and extraordinary tools available to a human being at any given time. Visual imagery has proven itself to be an important outlet for education, therapy, creativity, and many more distinctly human experiences. To have the capacity to recreate visual perceptions in the mind, or to create entirely new imagery altogether, is an important aptitude that should not be taken for granted.

As it turns out, there is a phenomenon where visual imagery is either reduced, or absent entirely in many individuals. Due to the elusive nature of the mind's eye, this disorder went undetected in humans for millennia, its mere existence was debated for centuries, and was only given a formal scientific name in 2015: *aphantasia* (Zeman et al. 2015). Although only recently scientifically recognized, *aphantasia* seems to have captured a broader public audience, as indicated by the thousands of individuals who have actively reached out to participate in studies on the disorder (Zeman et al. 2020).

Despite broader external pressure, the research on *aphantasia* has been scattered and incohesive in the past decade. A proper definition of 'aphantasia' has not yet been established, let alone a concrete neural mechanism (Blomkvist 2022).

This review aims to synthesize the information about *aphantasia* that has been established thus far, in order to better comprehend where a foundation exists, and where there are gaps that need to be filled by future studies. Furthermore, this review also aims to develop the connective tissue between *aphantasia* and another confounding cognitive phenomenon: *dreaming*. Although the association between *aphantasia* and *dreaming* is tenuous at best, better understanding of both phenomena is a necessary step to recognize and validate those individuals who have flown under the radar for all of their lives. To that end, the first step to proper recognition is diagnosis.

Diagnosing Aphantasia

In the literature, the primary tool for diagnosing aphantasia appears to be the Vividness of Visual Imagery Questionnaire, a self-reporting scale for describing the vividness of mental imagery (Marks 1973). Although the scale was initially developed to study the association between visual imagery and memory, the recent boom in popularity regarding the study of aphantasia requires an accessible yet scientifically certified method for diagnosis. The self-reporting nature of the questionnaire has been noted as a potential source of error by many, but the eagerness and relief experienced by many more who have taken the survey and self-diagnosed suggests that the results are overwhelmingly genuine and not fabricated.

However, in a multifactorial study of visual imagery and creativity, Friedlander et al. (2022) argue that visual imagery vividness is a multidimensional quality, operating on both the proximal/distal pathways, as well as ventral/dorsal neural pathways. An investigation into the VVIQ was performed, and although it was found that the VVIQ is multidimensional, it is not comprehensive in terms of assessing all different facets of creativity (Friedlander 2022). Takahashi et al. (2023) reinforce this idea, concluding in their diverse analysis of the disorder that the VVIQ may be used as an initial diagnostic tool, but is not specific in terms of identifying what types of imagery and cognitive functions are present or absent.

Even though the VVIQ is not a fully exhaustive assessment of creativity and visual imagery as a whole, that doesn't necessarily invalidate all other studies performed on aphantasia using this questionnaire as a methodological basis. However, it certainly complicates the research that has been conducted thus far, in terms of specifically identifying what mechanisms drive aphantasia.

What Has and Has Not Yet Been Established

In one of the most comprehensive cognitive profiles performed on aphantasia, Dawes et al. establish early in their findings that aphantasia reduces not just visual imagery, but also all other sensory modalities of imaging (2020). This lack of sensory imagery is associated with lower levels of sensory sensitivity, or responsiveness to stimuli, likely due to

less excitable sensory cortices (Dance 2021). Although many sensory modalities are affected, no two individuals experience aphantasia the same way; of the participants studied, only about a quarter reported an absolute lack of multi-sensory imagery altogether (Dawes et al. 2020).

This reduced or absent sensory imagery impacts an individual's ability to recall past events, both visually and semantically, as well as the ability to generate future hypotheticals (Dawes et al. 2020). Within the same year, a study on the greater phenomenon of phantasia reinforced many of these ideas, as well as identifying evidence that folks with aphantasia also struggle significantly with facial recognition (Zeman et al. 2020). Interestingly, even though many imagery-based tasks prove difficult for those with aphantasia, spatial imagery ability is not significantly impacted (Dawes et al. 2020).

Despite the significant time and attention that has been dedicated to the study of aphantasia thus far, the literature is, overall, unsatisfactory at this point in time. Even though a handful of key psychological impairments have been identified, there has yet to be much advancement beyond observation. Shockingly, the consistency between research studies has been subpar; many authors and teams end up having to propose their own definition of the term 'aphantasia,' which leads to the database feeling piecemeal and incomplete.

Blomkvist (2022) expertly critiques the state of the literature by assembling a figure showcasing the disparate definitions of 'aphantasia' used by different research teams, and how lack of synergy across studies has prevented the elucidation of an overarching cognitive mechanism. Although Blomkvist attempts to propose a new theory which centers around episodic processing impairment, as opposed to strictly image-based impairment (2022), research on aphantasia is still in its infancy, and it will likely be years before a cognitive mechanism is proposed and agreed upon by the field.

Equally frustrated with the lack of clarity regarding the circulating definitions of aphantasia, Arcangeli (2023) establishes early on that mental imagery is not the same thing as imagination, let alone creativity or potential. Furthermore, they emphasize that mental imagery is not an active form of imagination; it is merely a type of reactionary mental content. Sensory imagination, on the other hand, refers specifically to active imagery derived from psychological attitudes towards sensory stimuli (Arcangeli 2023).

Aphantasia is a heterogeneous condition under which further subcategories and labels can be created, but first and foremost, the overall umbrella term must be explicitly well-defined. Arcangeli's work, for example, states that those who experience deficits in mental imagery, sensory imagination, and/or both all fall under the label of 'aphantasia' (2023). Part of the immense difficulty in developing a concrete definition for aphantasia has been overcoming the broad, almost spectrum-like nature of the disorder, but if progress is going to be made in the research, this establishment must be made as soon as possible.

Curiously, much of the current literature has established that, even though the experience is reduced, the majority of individuals with aphantasia still have the capacity to dream (Dawes et al. 2020; Zeman et al. 2020). Granted, the dream experience for these individuals is reported to be less vivid on average, but the fact that it occurs at all seems counterintuitive to the aphantasic experience. For those individuals who cannot visually dream, a majority of them still reported dream experiences which included narrative, emotional, conceptual, and semantic input (Zeman et al. 2020).

Many of the more comprehensive studies which have focused on aphantasia tend to brush over this fact because the dream experience is less impactful for participants for aphantasia, but the fact that it exists at all warrants further investigation into both aphantasia and dreaming.

The Dream State

Much like aphantasia, dreaming is a confounding cognitive experience without agreed upon physiological causes or advantages. In a review of the mechanisms and physiological function of dreaming, Tsunematsu (2023) explores potential neural mechanisms such as the activation-synthesis model and the AIM model, but concludes that the physiological reason for dreams has not yet been determined.

If neither dreaming nor aphantasia are well-understood phenomena, how can a connection be made between the two in order to narrow the research gap? In a bold leap, Whiteley (2020) rejects the broadly accepted imagination model of dreaming proposed by Ichikawa, which claims that dreams are an agential form of sensory mental imagery (2016), and instead proposes a new model based on an illusory inactive state.

Soteriou (2017) lays the foundation for this new illusory model by proposing that: while in a dreamlike state, one is not entirely ignorant of their imaginings, but is still unable to fully comprehend that they are only imagining. There is a crucial difference between performing an action and only imagining performing said action, even in cases when one cannot tell they are merely imagining said action. The constitutive difference is the ability to exercise mental agency while in a wakeful state, and inverse inability when asleep (2017).

Whiteley takes Soteriou's work and synthesizes it with evidence from participants with aphantasia to modify and upgrade Ichikawa's working theories. In the new model, the dream state is not an agential source of information; instead, it is an involuntary state of imagination which "tricks" the mind into having the illusion of agency (2020).

The theory of dreaming as an involuntary action aligns with empirical evidence from individuals with aphantasia who cannot produce voluntary visual imagery, but still experience involuntary mental imagery (Dawes et al. 2020). Blomkvist's savant theory also presents dreaming as a phenomena lacking intention, and supports the idea that people with aphantasia have a deficit in 'top-down' (intentional) episodic processing, but some still have a functioning 'bottom-up' (involuntary) system (2022).

The only prominent author in the field who does not explicitly agree is Arcangeli (2023)—who dismisses the voluntary-involuntary binary, and instead proposes their mental-imagery/sensory-imagination dichotomy. However, Arcangeli only dismisses the binary in regards to the condition as a whole, not specifically pertaining to dreaming (2023).

That said, very few words in Arcangeli's work are dedicated specifically to discussing dreams, and Arcangeli gives Whiteley their due regards in the notes section, so one cannot say that Arcangeli explicitly disagrees with Whiteley in regards to dream phenomena.

Conclusion

Aphantasia is baffling. Its very existence seems to suggest that one of the most concrete human experiences is not indeed universally human, and that existential crisis arises before even beginning to understand the phenomena. If just the suggestion of lacking a mind's eye makes one feel

ungrounded from reality, one can only imagine how gone with the wind and abandoned by society those with aphantasia may feel.

However, in order to honor those who have endured silently for so long, proper understanding and scientific communication on the condition must be pursued. Moving forward, research must strive for definitions which are consistent across studies, well-established facets of the condition must be given deeper attention than mere observation, and most importantly, those participants with aphantasia must have their experiences respected and validated.

Understanding the cognitive physiological mechanisms behind dreams in individuals with aphantasia is not information to be easily attained within the next few years of research. What will be, though, is the experiences of those with aphantasia: how they perceive the world, how their mind's eye behaves, how they compensate in day-to-day life, how they dream at night, and how they dream in terms of ambition. To this aim, participatory research is crucial.

Continuing to research and communicate on aphantasia will bring ongoing relief and solidarity for individuals with the condition, including those who may not know the right term to describe their life experiences. As understanding on the disorder advances, so too does the comprehension of how infinite and awe-inspiring the human imagination can be.

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EXPLORING THE BENEFITS AND LIMITATIONS OF AVIAN-INSPIRED UAV DESIGN: A REVIEW

GAURAV DHIRAR



WRITER'S COMMENT: Since I was a small child, the simple idea that an object can gracefully maneuver the skies amazed me. The most natural and well-known example of flight is, of course, birds! It occurred to me that birds, small and large, short and long, and in all parts of the world are able to swiftly adapt to various weather, geographical, and aerodynamic conditions. However, modern-day aircrafts seem to lack the maneuverability and nimbleness that nature has proven to master. This thought lingered as unfulfilled curiosity until I met Dr. Christina Harvey at a school seminar. After learning about her world-renowned research on avian-inspired flight, I felt compelled to find out how truly effective avian-inspired UAV designs can be. With Dr. Katie Rodger's warm guidance and encouragement, I felt empowered to explore the benefits and technological advancements necessary for the practical realization of avian-inspired UAVs. I hope this literature review sparks excitement and curiosity about the efficiency and stability avian-inspired UAVs may offer!

INSTRUCTOR'S COMMENT: In my UWP 104E course, I encourage students to find topics that interest them and to use the class as an opportunity to practice research and writing for graduate school and career development. In last summer's class, Guarav Dhirar rose to that challenge and exceeded expectations as he developed his paper "Exploring the Benefits and Limitations of Avian-Inspired UAV Design: A Review." Guarav worked hard on the series of assignments that scaffold the paper itself: a proposal, an annotated bibliography, and a research matrix. He was enthusiastic and later shared with me

via email that he found the writing process "fun" - music to the ears of any writing instructor! I was blown away by Guarav's resulting literature review paper, which exhibits the exhaustive research he did, but also the thoughtful organization and synthesis of information on this fascinating topic. Guarav is a talented researcher and writer, which are skills that will take him wherever he hopes to go.

- Katie Rodger, University Writing Program

1. Introduction

Humans have been inspired by nature's design for much of their history as a species (Harvey et al. 2023; Kellert 2011). Structures that were created with local materials and designed with the patterns of the natural world in mind have led to some of the most functional, beautiful, and long-lasting buildings in the world (Kellert 2011; Rey-Rey 2022). Nature has also been the inspiration for many engineering applications, bringing designers closer to their goal of achieving higher efficiency and lower power consumption (Abbasli, Selcuk 2016; Anderson 2002; Harvey et al. 2023; Harvey, Inman 2021; Wenham 1866).

Aerospace engineers have long been fascinated and inspired by bird morphology and flight (Anderson 2002; Harvey et al. 2023; Schmitt, Gollnick 2016). Since birds are able to adjust to a large variety of weather conditions with their numerous degrees of freedom (Bilo 1994; Brown, Fedde 1993; Harvey et al. 2023; Harvey, Inman 2022), recently, there has been a growing interest in applying avian features to similar-sized unmanned aerial vehicles (UAVs) in hopes of increasing their efficiency and safety (Harvey et al. 2023; Harvey, Inman 2022). Aerodynamically stable and precisely actuatable UAVs may be of interest to many research and military entities (Gerdes, Gupta, Wilkerson 2012; Harvey et al. 2023); this, along with the curiosity of researchers across the globe has led to a greater push to understand why bird flight is so effective (Altshuler, Srinivasan 2018; Bilo 1994; Brown, Fedde

1993; Gamble, Inman 2017; Gerdes, Gupta, Wilkerson 2012; Harvey et al. 2023; Harvey, Inman 2022; Shannon et al. 2002; Weeks et al. 2023).

2. Historical Background

2.1 Natural designs being mimicked in human products

Biophilic design is an approach that prioritizes and recognizes the benefits of nature's involvement in human design. Not only can biophilic design reduce environmental impacts, it can also allow humans to feel closer to their local environment and boost their own health and well-being. Some elements of biophilic design involve utilizing environmental features, such as water and sunlight, and natural shapes, such as shells and spirals (Kellert 2011; Rey-Rey 2022). Famously, architect Jörn Utzon designed the Sydney



Figure 1: Sydney Opera House, Jörn Utzon, architect. This building dramatically juxtaposes bird- and sail-like forms against the waters of Sydney Harbour. (Kellert 2011)

Opera House with the peels of an orange in mind (Rey-Rey 2022).

Another example, stunningly fast bullet trains in Japan suffered from an unpopular weakness: they created large amounts of noise when they exited tunnels at high speeds. A birdwatcher on the train's team observed how a kingfisher would dive into the water to catch its prey without disturbing the surface of the water and decided to mimic the kingfisher's beak design in the bullet train. The result was a smaller pressure buildup at the exit of a

tunnel, resulting in a quieter, more aerodynamic, and more energy efficient train (Abbasli, Selcuk 2016; Prieto 2021). Many urban designers have also come to nature to find inspirations for sensible urban furniture. The cocoon of an uroidid moth is a 3-D net that encompasses the moth, offering it protection from other insects while also preventing the moth from drowning in the rain (Abbasli, Selcuk 2016).



Figure 2: The Uroidid Moth Cocoon [URL.07] (Abbasli, Selcuk 2016)

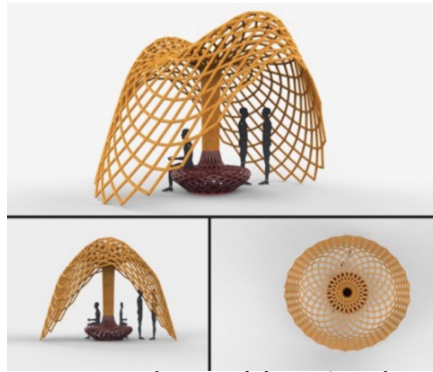


Figure 3: Final proposed design (Graphics by Ujal Abbasli) (Abbasli, Selcuk 2016)

This unique design can be mimicked to create productive public furniture, such as the seating structure seen in Figure 3 above, which creates partially shaded spots for citizens to rest and provides a large area for users to sit or stand; further, this design utilizes natural bamboo to lower its environmental impact (Abbasli, Selcuk 2016). Bio-inspired designs have proven to be useful, efficient, and reliable in various applications (Abbasli, Selcuk 2016; Kellert 2011; Prieto 2021; Rey-Rey 2022) – especially in flight (Anderson 2002; Harvey et al. 2023).

2.2 Avian designs being mimicked in flight

French electrical engineer Clement Ader famously created and flew the world's first piloted, powered airplane that took off under its own power. Ader, however, set himself apart from more

conventional engineers as he decided to carry out no organized experiments to obtain data for his plane design (Anderson 2002). He focused the design of his functional airplane solely on the natural morphology of birds and bats; after studying eagles, vultures, and other flying creatures in Paris and Algeria, he built the 'Eole' (Anderson 2002; Schmitt, Gollnick 2016). This monoplane had a wingspan of about 50 feet and was powered by a 20 horsepower steam engine, although it lacked proper mechanical flight controls. To control the airplane, Ader made the 'Eole' mechanically mimic the natural movements of a bat's wing. Emulating a bat's flight proved successful for Ader as the 'Eole' flew 165 feet in the air (Anderson 2002).



Figure 4: Clement Ader's flying machine, the Eole, 1890. (Anderson 2002)

Another prominent figure, Otto Lilienthal, the German pioneer of aviation known for his extensive documentation of his numerous successful glider flights, believed the best way to create powered flight was to copy bird techniques and focused his work on ornithopters, flying machines that obtain power with the flapping of their wings (Anderson 2002; Harvey et al. 2023; Schmitt, Gollnick 2016). Unfortunately, Lilienthal had complications with the vehicle's engine and died due to a flight accident before he was able to attempt flight on his second ornithopter (Anderson 2002; Schmitt, Gollnick 2016).

At the dawn of the aviation industry, giants such as Ader and Lilienthal took heavy inspiration from nature's flying creatures to physically build avian-inspired flying machines (Anderson 2002; Harvey et al. 2023; Schmitt, Gollnick 2016). However, it must

be noted that the study of bird morphology has not solely been beneficial with regards to physical experiments. For example, literature knowledge of flight grew when Francis H. Wenham, another pioneer in the aviation industry, delivered the first technical paper for the Aeronautical Society of Great Britain on June 27, 1866 with an amazing remark. He correctly theorized that "the swiftest-flying birds possess extremely long and narrow wings and the slow, heavy flyers short and wide ones." (Wenham 1866 as quoted in Anderson 2002). Although Wenham and others did not know why this feature, known as a high aspect ratio wing, was useful, it is now common knowledge that it is because it leads to

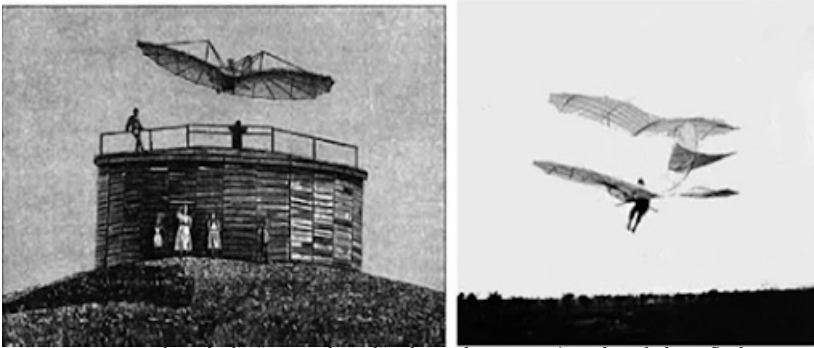


Figure 5: Lilienthal's "Sturmhügel" Flying base 1894 and a gliding flight (Schmitt, Gollnick 2016)

less induced drag (Anderson 2002).

3. The Benefits of Avian-Inspired Flight

3.1 Aerodynamic Benefits

Birds are able to quickly and efficiently react to unexpected changes in their flight due to their eyes and mechanoreceptors. These biological devices monitor course, angular position, linear velocity, and angular velocity. When the central nervous system

detects that the monitoring system is outputting an abnormal value, flight steering muscles activate to return the bird to an aerodynamically stable flight (Bilo 1994; Brown, Fedde 1993). Birds have various degrees of freedom and finite control elements, allowing them to react to a wide variety of situations with the exact actuation required; different parts of their body, such as their shoulder, elbow, and wrist joints, can be manipulated to reach aerodynamically stable states in different weather conditions (Bilo 1994; Brown, Fedde 1993; Harvey et al. 2023; Harvey, Inman 2022).

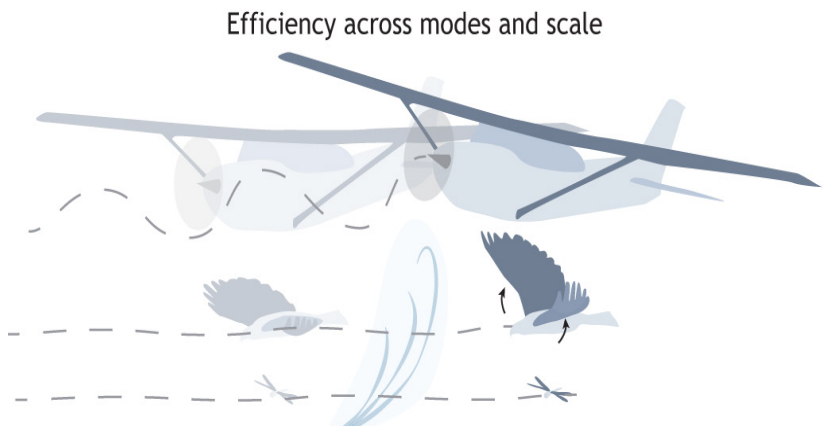


Figure 6: Animals can adapt effectively to a variety of environmental conditions. (Harvey et al. 2023)

As a result, if modern-day similar-sized UAVs were to model bird flight morphology, they have the potential to become more aerodynamically stable in adverse environments (Harvey et al. 2023; Harvey, Inman 2022). For example, if a bird encounters a strong disturbance, it can change its angle of attack, wingtip trace pattern, wing area, and feather orientation, to name a few, to avoid turbulent flight. The ability to actuate on many degrees of freedom combined with the ability to glide allows birds to consume less energy and have longer flights (Harvey et al. 2023; Gerdes, Gupta, Wilkerson 2012).

Gliding is an extremely efficient method of transportation

for birds as it allows them to travel with a much lower energy usage than that of which is required for flapping flight (Harvey, Inman 2021; Hedenström 1993). The aerodynamic efficiency of gliding birds and similar-sized UAVs have been compared to determine if gliding birds are more or less efficient; if similar-sized UAVs pale, aerodynamically, in comparison to gliding birds, it may be advantageous to study the soaring flight of those birds and understand what makes their flight more efficient (Harvey, Inman 2021).

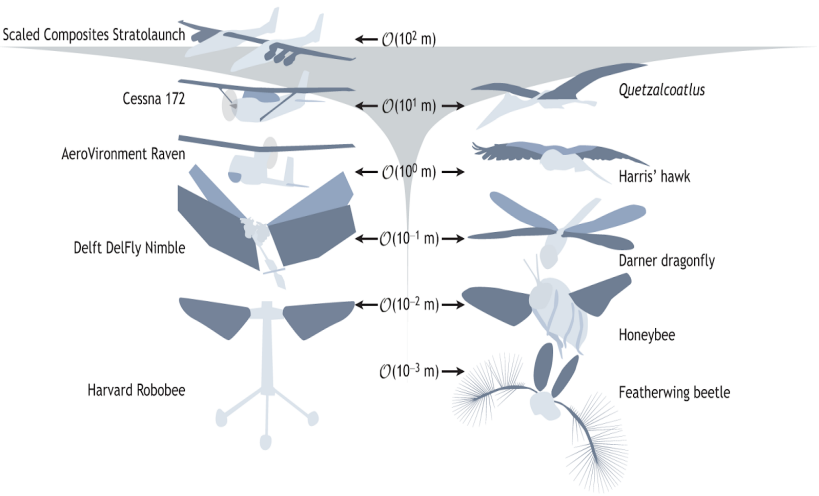


Figure 7: Flying animals and aircraft visualized at an approximately constant wingspan across several orders of magnitude. (Harvey et al. 2023)

The aerodynamic efficiency of gliding birds and similar-sized UAVs have been compared by their maximum lift to drag ratio (L/D_{max}). Gliding birds are extremely efficient (Harvey, Inman 2021; Hedenström 1993) in subcritical Reynolds number (Re) regimes and future avian-inspired UAVs may prosper by studying the morphology of gliding birds in that environment. However, in supercritical Re regimes, no striking difference has been found between the aerodynamic efficiencies of gliding birds and comparable UAVs. A bit of a startling result, this conclusion implies

that gliding bird-inspired UAV designs for supercritical Re regimes may not lead to higher efficiency and power values. However, the calculations from this experiment may be flawed and the result may be inconclusive (Harvey, Inman 2021); the reasoning for this is explained more in the 4.1 Lack of proper technology and satisfactory testing subheading below.

3.2 Non-aerodynamic Benefits

Bird flight may attract curious designers and engineers with its unique properties, some of which are not purely aerodynamic (Bilo 1994; Harvey et al. 2023; Gamble, Inman 2017; Gerdes, Gupta, Wilkerson 2012; Shannon et al. 2002; Weeks et al. 2023). Studying avian flight may allow engineers to create UAVs which disguise themselves more easily for reconnaissance applications (Gerdes, Gupta, Wilkerson 2012) and dissipate heat more easily for higher energy efficiency (Weeks et al. 2023). Studying avian flight can also offer us the indirect benefit of new simulations which would be able to more accurately predict bird flight paths and help us avoid head-on bird-plane collisions (Shannon et al. 2002).

3.2.1 Reconnaissance

Ornithopters, aircrafts which fly by flapping their artificial wings (Ahmed et al. 2022; Anderson 2002), are beneficial for reconnaissance use as they appear very natural in the air. Unlike gas and electric-powered UAVs which produce large amounts of noise, ornithopters are quieter at low flap rates and may not be detected as easily (Gerdes, Gupta, Wilkerson 2012). In comparison to physically rigid UAVs, birds are able to perform extremely agile flight maneuvers, allowing them to swiftly perch, hover, and navigate around small spaces (Ahmed et al. 2022; Bilo 1994; Harvey et al. 2023; Gamble, Inman 2017; Gerdes, Gupta, Wilkerson 2012). This would allow the avian-disguised UAV to

perch on a tree while it charges, or land on the ground to save energy as it tracks a stationary target (Gerdes, Gupta, Wilkerson 2012).

3.2.2 Heat Dissipation

Allen's rule, an observation that animals in warmer climates are longer-limbed, has been utilized to create a link between heat dissipation and longer limbs in animals. Animals, especially birds, with longer limbs are able to thermoregulate their body more efficiently. This finding can be applied to UAVs to increase their heat dissipation and in turn, the amount of energy lost from their system via heat (Weeks et al. 2023).

3.2.3 Bird-Aircraft Collisions

The American White Pelican (*Pelecanus erythrorhynchos*) has been studied extensively to create links between its soaring flight range and its location in the thermal layer. Gliding flight, for these pelicans, is reserved only for the thermal layer and the greater the thermal depth, the further they soar. Cross-country-traveling pelicans likely fly higher in the thermal layer to obtain longer ranges out of their gliding flight (Harvey, Inman 2021; Shannon et al. 2002); conversely, local-traveling pelicans likely fly lower in the thermal layer since they do not need to travel far distances. By studying how birds prefer to fly in different parts of the thermal layer, scientists in the meteorological field may accurately forecast bird flight routes; by knowing their time and position in the thermal layer, pilots can more easily avoid bird-aircraft collisions (Shannon et al. 2002).

4. Limitations

4.1 Lack of proper technology and satisfactory testing

Small UAVs are not very desirable products yet due to a critical factor: short flight times. Advances must be made in battery

energy density hardware, small electric motor efficiency, and power transmission efficiency to allow for practical UAV flights. A multimode locomotive system must be developed to allow the UAV to perform bird-disguised reconnaissance operations in an undetectable fashion (e.g. land, perch, walk, take-off independently). Birds' complex wing motions must be recreated at high levels of proficiency before observers are not able to tell whether the UAV they see in the sky is a machine or a real bird (Gerdes, Gupta, Wilkerson 2012). This, along with the need for higher payload-carrying capabilities on small UAVs, demands great strides be made in the miniaturization of sensors and the speed of processors (Gamble, Inman 2017; Gerdes, Gupta, Wilkerson 2012).

It must be emphasized that the startling finding found in the 3.1 Aerodynamic Benefits subheading may be due to the lack of technology needed to accurately measure a gliding bird's aerodynamic efficiency; more advances need to be made in efficiency measurement and calculation tools to be confident in our results. The novelty of this breakthrough research is clear when looking at the L/D calculations for a wandering albatross; this bird has been calculated to have an L/D of 14, 21 and 23, depending on the person. This shows how the methods used to measure gliding birds' L/D_{max} are not streamlined and may hold significant error. In order to determine whether gliding birds are truly more or less efficient than similar sized UAVs, first, satisfactory and reliable testing methods must be developed; the L/D calculation errors must be reduced drastically to offer the community an accurate standard for comparison (Harvey, Inman 2021).

Avian-inspired aircraft that are 'longer-limbed' (technically, 'longer winged' since UAVs do not have biological limbs) may be more energy efficient, however more testing is needed to confirm if the thermoregulation benefits result solely from the morphology of longer limbs or from another avian feature which birds possess as a result of having longer limbs (Weeks et al. 2023).

4.2 Lack of physical equilibrium

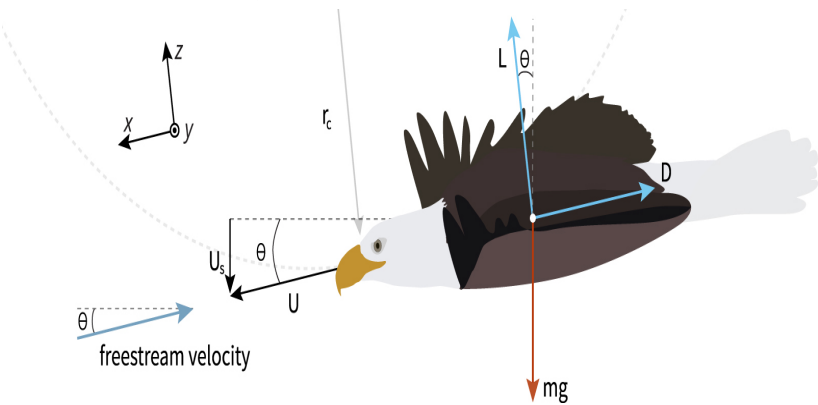


Figure 8: Force balance for steady gliding flight (without banking or turning). U is the (groundspeed – local wind) vector, U_s is the aerodynamic sink speed, θ is the glide angle between U and the Earth horizon, r_c is the radius of the path's curvature, L is the lift force, D is the drag force, and mg is gravity (Harvey, Inman 2021)

Animals utilize force and torque suddenly, such as by flapping their wings or rapidly moving their tail, and their whole body must adjust to this dynamic change (Dudley 2002; Harvey, Inman 2021). It is critical that their body is able to withstand this force and maintain total body force and moment vector equilibrium, for both linear and rotation movements.

Certain bird wing designs may be advantageous, but if utilized, the engineer should check to see how this new design dynamically impacts their whole UAV as a system. New forces or moments may come into play and make the system's flight dynamic unstable; it is critical that the new system is accurately analyzed before full production of the UAV begins (Dudley 2002).

An aircraft or bird in gliding flight experiences two main sources; the first source, written as the vector U_∞ , represents the forward velocity from the thrust of an engine or the flapping of wings. If wind is acting on the body of the entity at an arbitrary angle of B_0 with respect to U_∞ , the wind velocity can be denoted

as a second vector \vec{U}_0 . Adding these two vectors together creates a resultant velocity vector \vec{U}_R which details how the flight will respond to this wind disturbance. A new angle B can be denoted to represent the angle between the resultant velocity vector and the initial forward velocity vector \vec{U}_∞ . This angle can be called the 'sideslip' angle; a larger magnitude of B means that the gliding flight of the aircraft or bird was disturbed more (Gamble, Inman

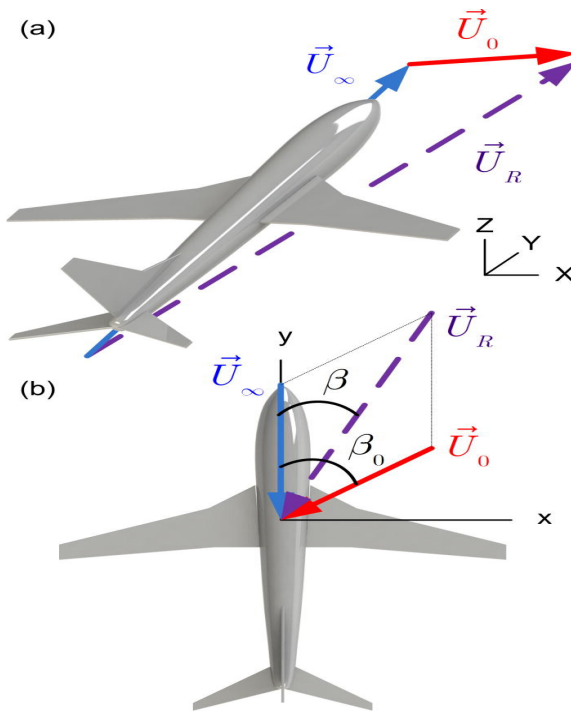


Figure 9: Velocity vectors relative to a stationary body. (a) Vector diagram in 3D relative to the global axis (X,Y,Z). (b) Vector diagram in 2D relative to the local body axis (x,y,z) considering only in-plane velocities. (Gamble, Inman 2017)

2017).

UAVs and birds, both of which are low-altitude fliers, are subject to smaller maximum wind speeds than larger aircrafts, which reside in the troposphere. However, unlike larger aircrafts,

low-altitude fliers receive wind magnitudes that are often greater than their flight speeds (Gamble, Inman 2017).

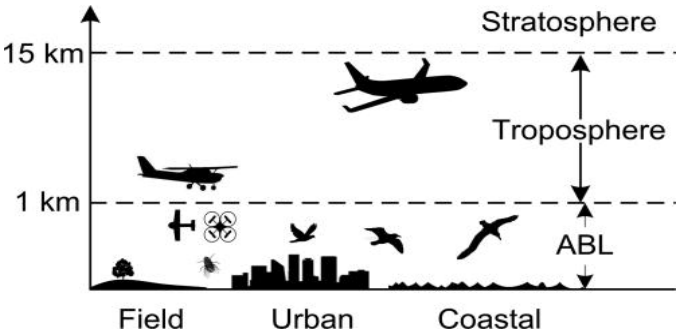


Figure 10: Visual representation of natural and engineered flier operational region and altitude. (Gamble, Inman 2017)

Since low-altitude fliers receive higher U_0 values, they are more likely to experience and adjust to larger sideslip angles. In tailwinds, these birds and UAVs can experience sideslips up to 3 times larger than those experienced by high-altitude fliers. This makes it much more difficult for low-altitude fliers to maintain their glide speed; if the sideslip angle is greater than 90° , the flier no longer possesses forward velocity (Gamble, Inman 2017). To maintain stable flight, birds have many degrees of freedom and control their surface geometry (Bilo 1994; Brown, Fedde 1993; Gamble, Inman 2017; Harvey et al. 2023; Harvey, Inman 2022). For small UAVs to be competent in the rough and unpredictable environment that low-altitude fliers reside in, they must implement actuators on a very small scale and ensure they work rapidly in a wide variety of situations (Dudley 2002; Gamble, Inman 2017; Harvey et al. 2023).

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5. Outlook

5.1 Conclusion and future research

This review does not include discussions on avian flight guidance systems and the link between birds' mechanoreceptors, central nervous systems, and optic flow – all critical areas of interest to better understand bird flight (for more information on this, see Altshuler, Srinivasan 2018; Bilo 1994); the focus of this review is more on how the morphology and actions of birds, which result from their sensory workings, can be used as inspiration to create more efficient and stable UAVs.

While avian-inspired UAVs may be more efficient, useful, and aerodynamically stable (Harvey et al. 2023; Harvey, Inman 2022), there is still much designers, engineers, and scientists have to learn about bird flight (Dudley 2002; Gamble, Inman 2017); Gerdes, Gupta, Wilkerson 2012; Harvey, Inman 2021) to effectively mimic the numerous degrees of freedom and finite control elements that allow birds to maintain stable flight (Bilo 1994; Brown, Fedde 1993; Harvey et al. 2023; Harvey, Inman 2022).

Smaller actuators, smaller sensors, and faster processors are all technological advancements that must be made in computer engineering to allow UAVs to work as quickly and effectively as birds (Gamble, Inman 2017; Gerdes, Gupta, Wilkerson 2012;

Harvey et al. 2023), which have the advantage of a central nervous system and optic flow (Altshuler, Srinivasan 2018; Bilo 1994; Brown, Fedde 1993).

Furthermore, methods of calculating L/Dmax for birds must be streamlined to reduce error; with more reliable L/Dmax numbers, scientists will be able to more confidently compare birds and UAVs to determine which entity is more efficient (Harvey, Inman 2021).

More research must be done in the avian-inspired aircraft research field, such as determining if birds' thermoregulation benefits come solely from their morphology or another attribute (Weeks et al. 2023); this will help the aerospace community and designers have more confidence in the benefits of avian-inspired design (Dudley 2002; Gamble, Inman 2017); Gerdes, Gupta, Wilkerson 2012; Harvey, Inman 2021).

5.2 Conflict of Interest

The author declares that there is no conflict of interest.

5.3 Acknowledgements

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Exploring the Benefits and Limitations of Avian-Inspired UAV Design: A Review

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USING GENETIC ENGINEERING TO IMPROVE CADMIUM PHYTOREMEDIATION

RAFAEL VASQUEZ-CHAN



WRITER'S COMMENT: Coming from a big city, I had always found the interactions between plants and humans fascinating. Whether it be weeds growing in impossible places, tree roots causing cracks in the sidewalk, or plants reclaiming that empty lot, many people do not realize just how resilient plants are. One way that this can be used to benefit both humans and nature is through a process called phytoremediation. By taking advantage of certain naturally resistant plants, areas that are contaminated due to anthropogenic processes could be returned to safe levels. In this review I wrote for my UWP 102B class (Writing in the Biological Sciences), I combined my interest in phytoremediation with another one of my passions, and my major, biotechnology. I believe that by using genetic engineering, phytoremediation can be taken to the next level. With a little help from humans, plants can be a much more environmentally friendly way to clean up contamination.

INSTRUCTOR'S COMMENT: Effective literature reviews go beyond recounting current research; they tell a research story that centers on the writer's own findings. The writer offers the audience a new understanding of the state of research on a topic derived from their own engagement with the literature and synthesis of its findings. Rafael Vasquez-Chan makes this challenging genre appear easy to master in "Using Genetic Engineering to Improve Cadmium Phytoremediation." From start to finish, Rafael never loses sight of the conventions of the genre or the needs of his audience. The latter is evident in the thoughtful context provided in the introduction, where

we learn why this research is crucial for both plant and human health and discover the scientific dilemma that Rafael addresses throughout the review. Capping off his analysis, Rafael suggests a rational potential path for future research in this area. Whether you want to learn about phytoremediation or you're seeking a model for your own literature review, Rafael Vasquez-Chan's article would be an excellent place to start.

- Melissa Bender, University Writing Program

Abstract

Cadmium toxicity can occur in humans with repeated exposure to the metal, causing significant health issues. Though it is naturally found in soils, anthropogenic processes have been causing an increase in areas with high levels of cadmium. One way to remove cadmium from soil is phytoremediation: the process of using plants to remove contaminants from soil. Despite phytoremediation being better for the environment, it has not yet seen extensive use since it is slower than other remediation methods. In this review we will focus on a potential solution to this: genetic engineering. By using genetic engineering, genes from hyperaccumulators of cadmium can be inserted into high biomass plants, theoretically increasing the rate at which cadmium is removed from the environment. We accessed Biosis and the Agriculture and Environmental Science collection of PubMed in order to gather peer-reviewed articles. Search terms included “cadmium,” “phytoremediation,” “transgenic,” and “overexpression.” Studies that differed in the types of genes that were inserted were selected. All studies showed that insertion and overexpression of the genes from cadmium hyperaccumulators increased tolerance to and (in most cases) uptake of cadmium by the transgenic plants. This consistency among results shows that insertion of hyperaccumulator genes is a procedure that can be used to increase the phytoremediation capabilities of plants

that would otherwise be harmed by the contaminant. However, more research is needed to confirm that phytoremediation rates will be increased when the transgenic plants are grown outside of controlled conditions.

Key Words: Cadmium, Phytoremediation, Genetic Engineering, Hyperaccumulator, Transgenic

Introduction

Cadmium (Cd) is naturally found in soils at a low concentration, most commonly as a result of weathering of Cd-containing rocks¹. However, anthropogenic processes such as mining, farming, manufacturing, burning of fossil fuels, and improper waste disposal are introducing Cd into soils at a much higher rate than what is natural¹. Cd can be taken up by plants which when consumed by animals, can accumulate to high levels. This is a serious issue, as Cd is toxic to both plants and animals, including humans. Cd causes an increase in oxidative stress, which means that it is not only a carcinogen, but will have negative effects on just about every system in the human body².

Cadmium is not an essential mineral for plants, and like in humans, it causes damage to plants, resulting in reduced efficiency or death. Cd uptake by plant cells leads to oxidative stress which culminates in cell death^{3, 4}. On the outside, plants will appear overall less healthy; common indicators of cadmium toxicity include stunted roots, wilting, reduced photosynthetic activity, and yellowing and death of leaves^{3, 4}. Because Cd is nonessential, there is no pathway that plants have to specifically uptake Cd. Instead, it is typically taken up by accident along with other essential metals through metal uptake pathways^{3,4}.

Phytoremediation is the process of using plants to remove both organic and inorganic contaminants from the soil and has been proven to be effective in removing cadmium from soil³. This is seen as a much more environmentally friendly way to return

contaminated areas into usable land; traditional remediation methods involve more disturbance and chemical usage. However, one downside of phytoremediation is that it can take much longer than traditional remediation techniques to remove the same amount of contaminants. This is because plants that are able to accumulate high levels of the contaminants (called hyperaccumulators) often do not grow rapidly, and plants that do grow rapidly are not able to hyperaccumulate the contaminant⁵. One solution to this issue is to use genetic engineering to modify rapidly growing plants, enabling them to accumulate the pollutant and remove it from the soil⁵⁻¹³.

This review will focus on the current state of using genetically modified plants to increase the amount of cadmium removed via phytoremediation. Studies have consistently shown that by inserting specific genes, the cadmium accumulation in plants can be increased⁶⁻¹³. These genes vary in the function that they increase, but all have to do with the transport or uptake of heavy metals. There has been much research on the effects of inserting single genes, but more studies are needed that focus on the possibility of inserting multiple genes, a technique called gene pyramiding. While using transgenic plants for phytoremediation sounds extremely promising, most experiments do not accurately simulate the conditions that would be found in a contaminated site. More research is needed to confirm that these genes will remain effective in plants grown outside of controlled laboratory or greenhouse conditions.

Gene Insertion Increases Phytoremediation Capabilities

Plants identified as Cd hyperaccumulators are labeled so because of their ability to resist the toxic effects that Cd has. This enables them to remain healthy while living in areas with high Cd content. However, these plants are not typically fast growers, and thus are not well suited for phytoremediation purposes^{3,5}. To be effective in phytoremediation of Cd, these plants would need to be able to rapidly increase their biomass. Through genetic engineering

this becomes a possibility. Insertion of specific hyperaccumulator genes into rapidly growing, high biomass plants increases their phytoremediation capabilities by increasing their tolerance and possibly increasing their Cd uptake ability⁶⁻¹³.

Increase in Cd Tolerance

It is impossible for a plant to be an effective phytoremediator unless it has mechanisms to survive high levels of the contaminant. By using biotechnology, plants that were originally sensitive to Cd can become tolerant. Numerous studies have shown that the insertion of Cd-related genes conferred some sort of resistance to Cd toxicity⁶⁻¹³. All these studies confirmed this tolerance by comparing root lengths of successfully transformed plants to the root lengths of wild-type plants when exposed to Cd. They each found that the transgenic plants either had longer roots or increased biomass compared to the wild-type plants⁶⁻¹³. Since this was consistent throughout studies, comparison of root lengths is a reliable indicator of increased Cd resistance.

Another way that increased tolerance was confirmed was by monitoring and comparing the oxidative damage caused by Cd exposure. Oxidative stress was confirmed in multiple studies to be lower in transgenic plants than wild-type plants when exposed to Cd^{6,8,10,12}. Interestingly, in the 2017 study by Chen et al., they found that oxidative stress increased in the transgenic plants compared to the wild type plants when exposed to Cd.. This is an outlier in that none of the other studies discussed experienced any sort of decrease in Cd tolerance^{6-10,11,12}. We hypothesize that this could be caused by the gene being inserted into the plant increasing Cd uptake ability without increasing the resistance to oxidative stress. This would make sense because the transgenic plant still showed resistance to Cd via longer roots. In addition to this, the plant that the gene comes from, *Sedum alfredii*, does not suffer from the same issue¹¹. This is an important realization, as it shows that different aspects of Cd tolerance can be altered by inserting genes.

Increase in Cd Uptake Ability

In addition to increasing Cd resistance, inserting Cd-related genes can increase the amount of Cd that is taken up by the plant. This is beneficial because an increase in the amount of Cd accumulated by the plant can speed up the phytoremediation process. Increased uptake by the transgenic plants were recorded in seven of the eight studies, and ranged from a 1.18 fold increase to a 4.7 fold increase in amount of Cd accumulated^{6-8,10-13}. However, similar to what happened in oxidative stress tolerance, one study actually showed the reverse effects. In the 2018 study by Chen et al. that focused on the MsYSL1 gene from *Miscanthus sacchariflorus*, the researchers found that the transgenic plant that had an overexpression of MsYSL1 increased its Cd tolerance by decreasing the amount of Cd it accumulated. This is in contrast to other studies where both the uptake ability and resistance to Cd were improved by insertion of a gene^{6-8,10,12,13}. It highlights the issue that inserting genes has more than one effect on the plant. More research is needed to be done to better understand what the gene changes and how this could positively or negatively affect growth of and accumulation by the plant.

Genes Inserted and Their Functions

Depending on the gene inserted, the specific function it has in the transformed plant can vary. Typically, the gene either plays a role in a certain step of metal transport or increases Cd accumulation by upregulating other metal transport genes. The majority of studies focus on the effects a single gene has. However, hyperaccumulators are not hyperaccumulators because they have a single gene that codes for everything⁵. More work needs to be done in looking at the interactions between genes and the possibility that genes can be inserted into a plant together to confer even higher levels of accumulation.

Metal Transport Genes

One of the most important functions that metal transport genes have is the binding to and neutralization of Cd. Phytochelatin proteins bind to metals and form complexes, detoxifying said metal and enabling easier transport of the complex by other mechanisms in the plant^{3, 12,13}. These proteins are coded for by phytochelatin synthase genes (PCS), which when inserted into *Arabidopsis thaliana*, have conferred increased resistance to and accumulation of Cd^{12,13}.

Another important type of transporter is those that focus on vacuolar sequestration. By storing harmful metals such as Cd in vacuoles, plants are able to reduce the negative effects, increasing their tolerance to the contaminant^{3,5}. Insertion of these genes has also been proven to increase the phytoremediation capabilities of plants against Cd^{6,7}. Despite these two types of metal transport genes having very similar functions, and both individually conferring increased Cd accumulation, due to differences in the methodologies and results it is difficult to determine whether one type of metal transport gene is more effective than the other.

Upregulation Genes

Certain genes increase tolerance to Cd by upregulating other genes that play a role in heavy-metal tolerance. This includes the ApHIPP26 gene¹⁰ and the MsYSL1 gene⁹, both of which have been shown to carry out this process when inserted into *Arabidopsis thaliana*. These genes sound like they would be the perfect candidates for combining with other Cd phytoremediation genes, however it is not as simple as that. Insertion of the ApHIPP26 gene did result in both increased tolerance and uptake of Cd, but it did this by both upregulating genes (AtNRAMP26 and AtNAS3) and downregulating others (AtNRAMP3, AtYSL2, AtIRT3, AtZIP4, and AtCAX3)¹⁰. The MsYSL1 gene on the other hand only upregulated genes (NRAMP4 and HMA2/HMA4), but it resulted in a decrease in the amount of Cd accumulation in the

roots when compared to the wild type plants. This demonstrates that complex interactions will occur when inserting new genes into existing plant systems. A limitation that both studies^{9,10} face is that the regulating gene has been cloned into *A. thaliana*, which may cause them to interact with genes differently than they do in their host organisms. These genes should be inserted into additional plants, both other hyperaccumulators and other high biomass plants, to see if they interact with genes any differently.

Pyramiding of Genes

The types of genes that have been discussed all contribute to Cd phytoremediation, so theoretically by inserting genes of different types into a single plant there should be an even greater increase in Cd accumulation and resistance. However, not much research has been done looking into the possibility of inserting multiple types of genes into a high biomass, non-tolerant to Cd plant. The closest that researchers have come to this was a 2008 study by Guo et al., where both PCS and glutathione (a heavy metal chelator) genes were inserted into *Arabidopsis thaliana* and overexpressed¹⁴. The results showed that the plants with both genes overexpressed accumulated more Cd than the plants with only one of the genes expressed. In a 2023 study by Zhao et al., they provide evidence that gene pyramiding can increase a plant's tolerance to abiotic stresses such as heat, drought, and salinity. Although they did not test for metal tolerance, it shows that gene pyramiding in plants can increase resistance and thus growth. More research needs to be done on the viability of adding multiple Cd phytoremediation genes into a high biomass plant, as there is evidence^{14,15} that it could increase phytoremediation abilities.

The pyramiding of these Cd phytoremediation genes may result in more complex interactions between them than one would expect.

Limitations

A major limitation that all but one of the eight case studies⁶⁻¹³ fail to address is the fact that real world applications of phytoremediation are nothing close to what is done in the lab and greenhouse. Though these results are exciting and provide new insight, they may turn out to be inconsequential.

Growth medium can greatly affect the ability of the plant to uptake nutrients, so by only using a growth medium such as MS media or hydroponics to justify Cd accumulation, there is an argument to be made that growth under real world conditions would yield different results. There were a number of studies that grew their plants in soil^{7, 8, 10, 12}, however this was still done inside a greenhouse, where growth conditions are ideal. The 2013 study by Shim et al. was the only study that grew their transgenic poplar trees in field trials at a real contaminated site. This enabled the researchers to gather enough data to calculate the bio-concentration factor of their transgenic plants. What they found was that the bio-concentration factor for their trees was 0.3 for Cd. To put this into perspective, a minimum bio-concentration factor of 14 was needed to effectively phytoremediate an area⁷. This disappointing result was the opposite of what was observed when they tested the same transgenic poplar trees in hydroponics and saw high accumulation. This demonstrates that without simulating realistic conditions, the actual capabilities of a gene to confer Cd phytoremediation abilities is questionable.

When planning a phytoremediation project, it is important to choose a species that will grow well in the environmental conditions of the contaminated site^{3,5}. A limitation that these studies do not address is how their results were justified only in model organisms, and not potential candidates for phytoremediation^{6,8-13}. The model organisms used in this case were *Arabidopsis thaliana*⁹⁻¹³ and *Nicotiana tabacum* (tobacco)^{6,8,13}. Although the genes increased Cd phytoremediation in these plants, they may result in different functions when placed into unresearched plants. This could be

caused by the complexity of genes; how one gene may have multiple effects on the plant or even a different effect than what was seen in the original plant. In fact, this was mentioned earlier in this review when discussing the 2017 study by Chen et al.. Oxidative stress was increased when the gene *SaNramp6* was placed in *A. thaliana*, but this was not seen in the plant the gene was taken from. It is understood that using model organisms is the first step when proving a concept, but that means more research is needed to prove the effect is maintained in other species.

Conclusion

Cadmium is a threat to humans, and one way to control it is to use phytoremediation. However, currently there are no such plants that can do it in a timely manner. But one way that scientists have been able to get around this is by using genetic engineering to insert genes that confer Cd accumulation and resistance into plants with high biomass. There are numerous genes that could be inserted, each of which provide Cd phytoremediation capabilities in a different way.

Unfortunately, there is still much work to be done before plants become the main way to restore Cd contaminated soils. Much more emphasis needs to be placed on going from a concept proven in the lab to more realistic field trials. Until then, it is unlikely that any results will lead to real life application. In addition to this, it is unlikely that insertion of single genes is enough to result in high Cd accumulating plants. The next logical step is to begin the search for compatible genes to insert into a high biomass plant, beginning the process of gene pyramiding and building a “super phytoremediator.”

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WOLBACHIA IN MOSQUITOES AS A BIOCONTROL AGAINST ARBOVIRUSES: MECHANISMS, VIABILITY, AND UNKNOWNNS

REX NEPSTAD



WRITER'S COMMENT: As an avid outdoorsman, I have spent much of my life under assault by various biting insects. Over several years of being eviscerated by mosquitoes no matter how much insect repellent I used, I developed a keen interest in forms of biocontrol against biting insects. Unlike most insecticides, which are indiscriminate and affect beneficial insects as much as detrimental insects, biocontrols are host-specific, only harming their targets. Last year, as a researcher at the Bohart Museum of Entomology, I came across literature on the usage of Wolbachia bacteria against mosquitoes, a relatively recent field of study that shows great promise as a biocontrol. Mosquitoes infected with the bacteria transmit it vertically to all offspring, have fewer viable offspring, and, most crucially, are inhospitable to many mosquito-borne pathogens, such as dengue and West Nile virus. With the relentless march of climate change causing range expansions for biting insects and the diseases they transmit, it is imperative that we research biocontrols like Wolbachia to stifle or prevent future epidemics of insect-vectorated diseases.

INSTRUCTOR'S COMMENT: YIn this informative and interesting review article, Rex Nepstad introduces readers to Wolbachia bacteria and its usage as a biocontrol against mosquito vectored arborviruses, such as dengue and West Nile virus. Thoroughly researched, Rex's review highlights the scholarship around Wolbachia as a biocontrol, including its ability to compromise both the immune system and reproductive system of affected mosquitoes, while also touching on the need for more public outreach and education to garner support from

the populations that might most benefit from it. More impressive than the information Rex puts forward in the article, though, is the obvious skill used to weave all this together into an incredibly accessible article that readers are able to understand.

- Jillian Azevedo, University Writing Program

Abstract

This review article discusses the mechanisms and feasibility of Wolbachia bacteria as a biocontrol against mosquito-vectored arboviruses. Wolbachia induces prominent changes in the reproductive and immune systems of mosquitoes. Reproductive changes include asexuality and cytoplasmic incompatibility, both of which further the spread of Wolbachia and reduce the number of viable offspring. Wolbachia's presence also increases host immune defenses, suppressing or preventing arboviral replication in infected mosquitoes. Most studies support that Wolbachia's presence inhibits arboviral replication irrespective of infection method. Although theoretically possible, arboviruses have yet to form mutations with sufficient replicative fitness to resist Wolbachia's inhibitory effects. Wild mosquito populations demonstrate stable or even increasing levels of Wolbachia infection, indicating successful sustenance in the wild. Public sentiment on the usage of the bacteria as biocontrol, while limited, has been generally supportive. While Wolbachia-induced reproductive and immune system changes in mosquitoes show great promise for future use of the bacteria as biocontrol against mosquito-vectored arboviruses, many of its precise mechanisms are unknown, necessitating further research on this subject.

Introduction

Mosquito-vectored arboviruses, such as dengue, cause tens of thousands of deaths yearly and damage the quality of life, economy, and health in areas where they are prevalent (1). Since arboviruses

are difficult to treat and lack fully-developed vaccines, mosquitoes are generally targeted to prevent arboviral spread. Most vector control techniques include low-level insecticide spraying, which can be damaging to the environment. Biocontrol has emerged as an eco-friendly alternative in recent years, with *Wolbachia* bacteria proving promising (1). The bacteria, a natural endosymbiont found in most arthropod species, has been observed causing two distinct effects in mosquitoes that make it useful as biocontrol against arboviruses: reproductive alterations, such as asexuality and cytoplasmic incompatibility, and a hindering/blocking effect against arboviral replication in infected mosquitoes (1, 2, 3, 5, 7, 8). The two effects combined provide excellent biocontrol against arboviruses, and, in the case of reproductive alterations, mosquitoes themselves.

Wolbachia-mediated reproductive alterations are meant to further the spread of the bacteria itself (1). *Wolbachia*-mediated asexuality forces parthenogenesis in female mosquitoes, allowing for the bacteria, which is transovarially transmitted, to colonize infected females' offspring (8). Another, more insidious method of reproductive alteration is *Wolbachia*-mediated cytoplasmic incompatibility, wherein infected males cannot have viable male offspring with uninfected females (5). When infected males mate with uninfected females, male embryos suffer cell cycle defects, causing dysfunctional histone deposition and incomplete DNA replication; this ultimately kills the embryo (5). Infected males can have fully viable offspring with infected females, and all such offspring end up infected with the bacteria (5, 8). While not a blanket form of biocontrol, the reproductive alterations ultimately decrease the number of offspring and thus the number of vectors for mosquito-borne arboviruses. What truly makes *Wolbachia* effective as a biocontrol against arboviruses, though, is its effect on the mosquito immune system. While this mechanism is not truly understood, experiments have shown that the bacteria's presence within the mosquito triggers a heightened immune response (1, 7). The bacteria's continuing presence keeps the immune response

at a defensive level, during which any pathogens, particularly arboviruses, are attacked strongly (7). This attack strongly hinders or even prevents arboviral replication, thus preventing the mosquitoes from vectoring them (7). The arboviral inhibition is what truly makes *Wolbachia* an effective form of biocontrol against arboviruses.

Biocontrol-intended *Wolbachia*, however, is not without its drawbacks. Questions remain as to whether arboviruses can mutate rapidly enough to escape the blocking effects of *Wolbachia*, whether the method of infection impacts its arbovirus-blocking effect in mosquitoes, whether the bacteria is sustainable in wild populations, and how accepting the public is of its use as a biocontrol. Nonetheless, in spite of the limited knowledge behind its mechanisms, recent research supports using *Wolbachia* in mosquitoes as a form of biocontrol against mosquito-vectoring arboviruses.

The Effects of *Wolbachia* on Mosquito Reproduction

Wolbachia bacteria are known to alter mosquitoes' reproduction in two ways: by causing simple asexuality or a more complex phenomenon called cytoplasmic incompatibility (1). Research detailing how *Wolbachia* induces asexuality in mosquitoes is nonexistent, but the bacteria has identical effects on similar arthropods, such as wasps (8). Wu et al. (2020) conducted an experimental study on *Wolbachia*-infected *Trichogramma* wasps to determine the epigenomic and transcriptomic modifications made by the bacteria to induce asexuality. To discern such modifications, the researchers took wasps without *Wolbachia* and introgressed their genomes into a cytoplasm infected by the bacteria. *Wolbachia* then mediated the wasps into asexual forms capable of parthenogenesis. After doing so, the wasps were then cured of the bacteria, allowing the researchers to analyze the wasp genomes without bacterial interference. Upon analysis, it was discovered that the *Wolbachia* had altered the expression of certain genes and heightened DNA

methylation, neither of which overlapped; this indicated that the Wolbachia-mediated changes in DNA methylation did not directly affect gene expression. Some of the changes were found to be host-specific to the wasps, so the exact mechanisms behind Wolbachia-induced asexuality in mosquitoes are not fully known (8). Nonetheless, the bacteria's reproductive modifications allowed for asexual reproduction of identical female clones of the infected females (5, 8). As Wolbachia is transovarially transmitted, this only serves to increase its spread, but it also allows the bacteria to make excellent biocontrol - widespread parthenogenesis in the mosquito population causes a surplus of females and few males, stifling reproduction and reducing the number of mosquitoes.

Asexuality is the less severe of Wolbachia's two effects on mosquito reproduction, as cytoplasmic incompatibility is far more insidious. This phenomenon causes lethal defects in the cell cycle of male offspring of a Wolbachia-infected male and an uninfected female (5). However, when both the male and female mosquito are Wolbachia-infected, their offspring do not suffer the lethal defects and are themselves infected with the bacteria. Landmann et al. (2009) observed the cell cycle in male offspring of a Wolbachia-infected male and an uninfected female. It was discovered that two specific histones, H3.3 and H4, had defective deposition. Additionally, the replication factor PCNA was found to be retained within the male pronucleus. The two defects work in tandem, causing the male pronucleus to enter mitosis with defectively condensed chromatin and DNA that has not been fully replicated. The defect within H3.3 deposition hindered the ability for proper transcriptional regulation in development, causing cell cycle steps with increasingly detrimental issues. This defect ultimately compounds to render male mosquito embryos of this form of cytoplasmic incompatibility unviable. While Wolbachia is definitively linked to this phenomenon - it is not observed occurring in mosquitoes without the bacteria - it is unknown how precisely it induces this (5). Nevertheless, similarly to Wolbachia-mediated asexuality, this facet of the bacteria's influence on

mosquito reproduction has excellent potential for biocontrol. As many females in wild mosquito populations are uninfected with *Wolbachia*, releasing large numbers of infected males will cause vast numbers of inviable offspring (5, 8). Such releases reduce mosquito populations notably, diminishing the likelihood of mosquito bites and thus the transmission of arboviruses.

How *Wolbachia* Suppresses Arboviral Replication and Infection in Mosquitoes

The second factor of *Wolbachia*'s two-pronged functionality as biocontrol is its ability to strongly hinder or halt arboviral replication in its hosts. Several studies have been done on this subject, almost all finding that *Wolbachia* successfully inhibits dengue and West Nile viruses (1, 2, 3). However, the exact mechanisms behind this were debated until recently. It was originally hypothesized that *Wolbachia* bacteria outcompete other pathogens within the mosquito for nutrients, thus starving them and preventing them from surviving in infected mosquitoes (1). A second hypothesis, however, claimed that the bacteria trigger the host's immune response, heightening its defenses and making the host more hostile to pathogen infection (1, 7). The second hypothesis was supported by a Zhang et al. (2020) experimental study. *Culex* mosquito larvae were collected, serially treated with tetracycline to eliminate any naturally-occurring *Wolbachia*, and, six generations of mosquitoes later, two *Wolbachia*-free *Culex* sample populations were created (7). The mosquito RNA was sequenced and analyzed to record changes between *Wolbachia*-infected mosquitoes and those that had never had the bacteria, and immunity-related differential expression genes were identified. One group of mosquitoes was reinfected with *Wolbachia*, while the other was not. Both groups were then infected with different bacteria: some with *Escherichia coli*, some with *Micrococcus luteus*, and some with nothing at all as a control. Survival curves were found to be markedly higher for mosquitoes with *Wolbachia* than those without across both

bacterial species. This correlation indicates a heightened immune response induced by Wolbachia, reducing the likelihood of death by pathogenic bacteria (7). It is notable that this study does not cover arboviruses, but the hypothesis it supports is far more plausible - viruses are far less likely to compete with bacteria for resources, and a heightened immune response is a prime suspect in the reduced/halted arboviral replication. Ultimately, while Wolbachia-induced immune defenses are a likely reason, the precise mechanism behind the bacteria's influence on arboviral replication has not been fully determined with current research.

Method of Infection with Wolbachia does not Affect Blockage of Arboviral Replication

In almost all prior research on the topic, the presence of Wolbachia is enough to inhibit arboviral replication in infected mosquitoes. Some studies have suggested that the method of Wolbachia inoculation impacts how effective it is at inhibiting pathogens, with one even claiming that *Culex* mosquitoes transiently infected with the bacteria were worse at inhibiting arboviral replication than uninfected mosquitoes (1, 3). To counter this experimental outlier, Joubert and O'Neill (2017) conducted an experimental study focusing on the level of viral replication in *Aedes aegypti* mosquitoes in two groups: one stably transfected with Wolbachia, and the other transiently infected (3). After inoculation, it was discovered that the locations of the Wolbachia in the mosquitoes were different depending on the method of infection. Mosquitoes stably transfected with Wolbachia had the bacteria heavily concentrated within the ovaries, with bacteria present in lesser numbers throughout the body. Mosquitoes transiently infected, however, had bacteria present throughout the body, but little within the ovaries. Ultimately, it was found that both forms of infection proved to inhibit dengue viral replication equally, with little to no viral replication found in all trials (3).

As such, the presence of *Wolbachia* itself inhibits viral replication irrespective of how the mosquito obtained the bacteria.

Arboviruses are Unable to Form Resistance Against *Wolbachia*-induced Immune Responses

With drug-resistant viruses and bacteria becoming prevalent and problematic globally, it is not unreasonable to think that arboviruses could acquire mutations to allow them to escape *Wolbachia*'s inhibitory effects. K. M. Edenborough et al. (2021) conducted a review of several recent experimental studies to determine whether dengue virus, a prominent arbovirus, could evolve resistance to *Wolbachia* (1). Intriguingly, almost all dengue virus strains were found to be hapless in the presence of the bacteria. Some viral strains did demonstrate an ability to replicate in the presence of *Wolbachia*, but such strains had poor replicative fitness and could not replicate sufficiently before ultimately dying out. Additionally, it was found that the extremely low frequency of *Wolbachia*-resistant dengue viral particles made it exceedingly unlikely that a mosquito would imbibe resistant viral particles in a blood meal. This combination of factors prevents *Wolbachia*-resistant viral strains from persisting in the gene pool (1).

Although the review article condensed information from many prior studies, a recent experimental study was conducted by C. Koh et al. (2019) confirmed that arboviruses cannot evolve *Wolbachia*-resistant mutations with sufficient replicative fitness to persist (2). A specific dengue virus strain was passaged through three different *Aedes aegypti* cell cultures, each with its own mode of *Wolbachia* infection: one completely free of the bacteria, one infected with the bacteria, and one formerly infected with the bacteria but treated with tetracycline to remove it. After several passages through the cell cultures, the viral isolates were then quantified and subjected to replicative fitness assays to determine if meaningful *Wolbachia*-resistant mutations arose and if they were beneficial to fitness. The study found that dengue virus isolates

from the Wolbachia-free mosquito culture, which functioned as a control, replicated as normally as ever. Viral isolates from the Wolbachia-infected cells were heavily reduced and had terrible replicative fitness, with some trials dying out entirely before passage was completed. Viral isolates from the tetracycline-treated cells had reduced replicative fitness compared to the Wolbachia-free isolates, but fared much better than those from the Wolbachia-infected cells. The results from the tetracycline-treated cells were unexpected, given the lack of Wolbachia; as such, the reduced replicative fitness from the isolates passaged through that culture could not be definitively linked to the fact that the cells were once infected with Wolbachia. The researchers hypothesized that either the residual Wolbachia remnants had a dampening effect on viral replication, or that tetracycline itself was the factor affecting viral replication (2). Given the overall results, it was concluded that the presence of Wolbachia almost completely halts viral replication compared to environments free of the bacteria (1, 2).

Given recent discoveries in the field of Wolbachia's effects on arboviral replication, it is unlikely that Wolbachia itself is responsible for reduced/halted replication - it is likely the heightened immune defense Wolbachia elicits that prevents arboviral replication (7). Although unconfirmed, arboviruses are thus far unable to form genetic mutations to evade the Wolbachia-induced host immune defense; some are able to survive it, but have poor replicative fitness, and others simply die out without replicating at all (1, 2). Nonetheless, Wolbachia's indirect effect on arboviral replication makes it an excellent candidate for biocontrol against mosquito-vectored arboviruses.

Wolbachia Sustenance and Expansion in Wild Mosquito Populations

As Wolbachia has been used in both trial and serial biocontrol efforts against mosquito-borne arboviruses, questions have arisen as to whether it has staying power in natural mosquito

populations. While *Wolbachia* is a common endosymbiont found in most arthropods, introducing it in mosquito populations where it is nonexistent increases the risk for the bacteria failing to establish (1). To test this, Torres et al. (2020) conducted a survey on the presence of naturally-occurring *Wolbachia* strains within mosquitoes in California's Central Valley (6). Adult mosquitoes of all species were collected from several sites over two years, after which they were analyzed for *Wolbachia* presence. Analysis was conducted using both traditional and quantitative PCR via identification of *Wolbachia*-specific RNA and surface proteins. Strains and supergroups of the bacteria were determined via Multilocus Sequence Typing (MLST) of five *Wolbachia*-specific housekeeping genes. Upon analysis, it was determined that eight of the twelve mosquito species present in the area were positive for *Wolbachia* bacteria, up from six previously, whereas four did not have a trace of the bacteria. Additionally, two of the mosquito species were positive for *Wolbachia* supergroups A and B, marking the first time the two supergroups were found in regional mosquito populations; this discovery indicates successful establishment of *Wolbachia* in the region. This survey was conducted in an area known for experimental *Wolbachia* biocontrol, so it is unknown whether the *Wolbachia* increase was natural or due to biocontrol measures (6). Nevertheless, it shows promising results - the more *Wolbachia* in wild mosquitoes, the more widespread arboviral inhibition is, thus reducing arboviral vectoring potential in infected mosquito populations.

Public Sentiment on the Usage of *Wolbachia* as Biocontrol

To date, there is very little measurement on public sentiment for biocontrols similar to *Wolbachia*, let alone the bacteria itself. One such public opinion survey was taken in Singapore, a country known for an eclectic mix of scientific innovation and social conservatism, as well as its tropical climate favorable for arboviral

transmission (4). C. Liew et al. (2021) conducted several surveys, including online surveys, in-person street surveys, household surveys, and household surveys in regions where Wolbachia-infected mosquitoes were released as biocontrol. The results were intriguingly scattered, but most respondents agreed that Wolbachia should be used as biocontrol. Levels of agreement were varied, with most agreeing or remaining neutral. The outliers were those who disagreed or strongly disagreed, indicating that, in a country plagued by dengue virus infections, Wolbachia use as a biocontrol agent is supported (4).

Public sentiment in regions with lower education levels and less awareness of scientific advances, such as the Americas, Africa, and South Asia, is murkier. While no surveys on Wolbachia as biocontrol exist in those regions, public reactions are likely to be mixed, with ardent supporters and equally ardent opposers (1). Given the novelty of Wolbachia as a biocontrol, public outreach and education is critical for public awareness of the technique and subsequent support. Ultimately, though, public sentiment is unknown and will vary by region and culture.

Conclusion

Recent research supports that Wolbachia shows excellent promise as a biocontrol against mosquito-vectored arboviruses. The bacteria indirectly reduces mosquito numbers by inducing asexuality and cytoplasmic incompatibility, heavily reducing the number of offspring and ensuring surviving offspring are inoculated with the bacteria (1, 5, 8). Wolbachia's presence also heavily inhibits or even blocks arboviral replication in infected mosquitoes (1, 2, 3, 7). While it was once thought that Wolbachia inhibited arboviral replication and other pathogens via competition for resources, recent research has indicated that the bacteria triggers a heightened immune response in infected mosquitoes, thus indirectly reducing/halting arboviral replication and preventing vectoring in infected mosquitoes (7). Although there are occasional outliers, most experimental studies support that Wolbachia's presence alone helps

reduce/halt arboviral replication irrespective of how the mosquito obtained the bacteria (3). Studies have previously focused on arbovirus' inability to form genetic mutations circumventing Wolbachia's inhibitory effects; given that recent research indicates Wolbachia has an indirect effect on arboviral replication, it is more likely that arboviruses will have to mutate to circumvent the host's immune response to effectively replicate in infected mosquitoes (1, 2, 7). Wolbachia is increasingly found in wild mosquito populations, bolstering its ability to function as biocontrol against arboviruses (6). While public awareness of Wolbachia's potential for biocontrol is limited, surveys in regions with high incidence of arboviruses indicate general public approval and support (5).

As far as research on Wolbachia and its effects goes, there is a general, surface-level modicum of understanding with extensive literature supporting its effects. However, most aspects of the bacteria's effects on mosquitoes, such as how it manipulates reproductive systems and reduces/halts arboviral replication, are only correlated to Wolbachia, not definitively linked by causation. As such, further research is imperative to determine the precise mechanisms behind Wolbachia's inhibitory effects. Research on how it triggers the mosquito immune response to hinder arboviral replication is of extreme importance, as Wolbachia is not only found in mosquitoes - it can be found in all arthropods. The use of Wolbachia as a biocontrol against mosquito-vectored arboviruses is only the beginning. With further research, Wolbachia could be deemed usable as a biocontrol against various other arthropod-vectored diseases, such as Lyme disease in ticks, leishmaniasis in sandflies, and Chagas disease in kissing bugs. As it stands currently, recent research fully supports using Wolbachia as a form of biocontrol against mosquito-vectored arboviruses, and further research will only bolster its credibility.

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LEIOMYOMA EMULATING MALIGNANT LEIOMYOSARCOMA DUE TO MISLEADING PAIN SEVERITY: A CASE REPORT

FABIOLA DAMIAN



WRITER'S COMMENT: When I was initially tasked with writing a professional case report for my course, I knew exactly who I wanted my subject to be. I chose to write about my Mom's experience with uterine fibroids as I reflected on how severe and memorable this part of our lives was. I enjoyed writing this piece because it was a valuable learning experience as someone seeking a career in healthcare and I was able to take on the role of a physician by inspecting a case from a medical standpoint. One of the most difficult aspects of the assignment for me was to detach any feelings in my writing to successfully describe my Mom's case as if I were a physician, and though challenging, it proved to be rewarding as it gave my Mom space to reflect on her experience during a tough time and view the strength in her perseverance. With this piece, I hope to encourage others to have an open discussion about one's health as it can prove to be healing for those involved.

INSTRUCTOR'S COMMENT: In my Writing in the Professions: Health course, one assignment is a formal case report. It is a challenging assignment, so much so that I feel guilty inflicting it every quarter. The students must produce a paper that in every way models itself on real, professional case reports, written by physicians, for physicians. They must further write about a real person who is hurt or sick, and the person cannot just have a mild case of the flu; what we need is a serious and complex case involving the kind of clinical challenges that become the subject of real case reports. Fabiola found just that, a case in which diagnosis was so challenging as to be effectively impossible,

given the deceptive nature of the symptoms. The result is a case report which is different in no really crucial way from the real thing, in a real medical journal, except that the author is in fact still a student—although you can hardly tell.

- Scott Herring, University Writing Program

Introduction

Leiomyomas are benign smooth muscle tumors located in the subserosal, intramural, or submucosal regions of the uterus. Their shape may be pedunculated or sessile and they originate from myometrium. These non-malignant tumors grow based on the levels of circulating estrogen (Barjon 2022). Though the pathogenesis of fibroids is not well understood, it is clear that the myometrium follows abnormal signaling pathways of cellular division. Recent research is focusing on karyotypic abnormalities and gene expression to define malignant potential for uterine smooth muscle tumors (Stewart 2001). The presence of uterine fibroids can cause menometrorrhagia, pelvic pain, disruption of surrounding pelvic structures, and lumbago. Most cases are asymptomatic, with 15 to 30% of patients with fibroids developing severe symptoms (Biest et al. 2023). Here, I report a case of a forty-year-old female who suffered from severe visceral pain in the right lower quadrant caused by non-malignant tumors located in the uterus, which was found to be non-malignant only during surgery due to the misleading severity of stabbing pain.

Case Report

A forty-year-old premenopausal female experienced severe visceral pain in the right lower quadrant of the abdomen that progressively worsened over six months before surgical treatment. The patient reported symptoms of dysmenorrhoea with the trigger being every menses each month. She also had symptoms of

presyncope and acute fatigue. One month before surgical treatment, she experienced abdominal pain at a steady level of eight on the Wong-Baker pain scale in the right lower quadrant due to severe dysmenorrhea and self-medicated with 400 mg of ibuprofen. Four days later, she was admitted to a local community hospital where ultrasonography revealed the presence of fibroids on the right side of the uterine region lateral to the fundus. The physician suspected leiomyoma; however, the nature of these tumors along with the reported symptoms made the diagnosis tentative. Her vital signs were normal with a temperature of 37°C, blood pressure of 118/50, pulse rate of 75/min, and respiratory rate of 14/min.

Since the patient belongs to a large U.S. HMO, she was referred to a specialist at a regional hospital, due to the inability to define the tumor as benign or malignant via ultrasonography. The patient reported feeling discomfort in the right lower quadrant of the abdomen when the physical examination was conducted by the OBGYN. An MRI revealed gray areas on the right side of the uterus, suggesting necrosis, which could contain malignant cells. The diagnosis remained tentative, leading the surgeon to recommend a hysterectomy and histologically inspect samples via microscopic equipment to make a differential diagnosis. Two weeks later following the visit at the regional hospital, a hysterectomy along with an appendectomy was performed. A unilateral oophorectomy of the right ovary was conducted due to the inability to debride it from the uterine fibroid. The uterine fibroid was revealed to be benign, differentiating it as a case of leiomyoma. The left ovary was able to be debrided, sparing the patient from being prescribed estrogen replacement therapy for menopausal purposes. The pathologist confirmed the size of the uterine fibroid to be 17 cm in diameter and weighed five lbs.

Following the operation, the patient's vitals were 36.7°C, blood pressure 112/44, pulse rate 71/min, and respiratory rate 16/min. Her hemoglobin levels were significantly low at 9.8 g/dL. At the time of discharge, she was prescribed 220 mg of naproxen sodium to relieve pain and a spirometer to improve lung ventilation. Two

days after discharge, she experienced high abdominal distension along with postoperative ileus and was admitted to the original local community hospital. She was prescribed two medications to alleviate post-operative symptoms. In a month follow-up, she was asymptomatic with progressive post-operation healing. In the assessment of postoperative complications, imaging revealed hepatic lesions; however, due to the benign nature of the lesions, treatment was not necessary and she was advised to return in a year for monitoring purposes. The patient continues to follow up at her local community hospital so that the physician can monitor the hepatic lesions.

Discussion

Uterine leiomyomas, benign clonal tumors originating from smooth muscle cells in the uterus, are clinically present in 25% of women with a prevalence as high as 77% (Stewart 2001). Black race is associated with an increased risk with 80% of Black women in the United States being diagnosed by age 50. The bleeding pattern should be monitored to differentiate it from endometrial disease, one that is characterized by bleeding at other times of the menstrual cycle. Recent hypotheses claim that leiomyoma formation may be due to hypoxia in myometrial cells during menstruation. If the uterine fibroid contains malignant cells, it is considered leiomyosarcoma. In the U.S., uterine sarcoma is rare, accounting for 3 to 7% of all uterine cancers (Ramirez et al. 2022). The symptoms of uterine sarcomas are similar to the symptoms experienced with uterine fibroids. Though the cause is unclear, prior pelvic radiation and tamoxifen are considered risk factors. In another case reported in 2012, a 65-year-old female was diagnosed with uterine leiomyosarcoma arising from preexisting leiomyoma (Ajmera et al. 2012). Metastasis from leiomyosarcoma occurs mainly in the lungs, liver, brain, kidney, and bones. The prevalence of metastasis from leiomyosarcoma is rare with a prevalence of 3.5%. Myometrium and myoma have abundant

eosinophilic cytoplasm, and the nuclei are of uniform size, shape, and chromasia. A malignant leiomyosarcoma is hypercellular and less fascicular and consists of atypical smooth-muscle cells with hyperchromatic, enlarged nuclei. It can be difficult to differentiate between benign myomas and malignant leiomyosarcoma since they can share histological features.

The treatment for leiomyomas is either surgical or medical, based on the size and location of the fibroid, symptoms, age and reproductive desires, and the skill of the surgeon (Stewart 2001). A myomectomy removes the uterine fibroids while still conserving the uterus, though recurrent fibroids could be a problem with the probability of a second operation being as high as 26%. It is recommended for the myoma to be 8cm or less in diameter for this procedure. Uterine-artery embolization treats myomas by controlling the arterial circulation to control symptoms. An androgenic steroid, danazol, induces amenorrhoea to control anemia due to myoma-related menorrhagia. Another androgenic steroid, gestrinone, causes volume reduction and amenorrhoea in women with myomas. GnRH agonists work by increasing the release of gonadotropins, which is followed by desensitization and downregulation to a hypogonadotropic hypogonadal state clinically resembling menopause. This medical therapy causes a reduction in uterine size and amenorrhoea in women. GnRH agonists are a temporary solution as the resumption of menses and previous uterine volume can occur and they are primarily used to prepare a woman for surgery. Naproxen blocks arachidonate binding to inhibit both cyclooxygenase isoenzymes, COX-1 and COX-2, resulting in analgesic and anti-inflammatory effects (Brutzkus et al. 2023). The anti-inflammatory mechanism of naproxen is due to decreased prostaglandin synthesis by inhibiting COX-1 and COX-2.

The diagnosis of uterine requires ultrasonography, saline infusion sonography, or MRI (Biest et al. 2023). Imaging should be performed if a pelvic examination results in abnormalities or if symptoms arise. Histological analysis via microscopy equipment

is used for diagnostic purposes when the surgeon is differentiating between myoma and leiomyosarcoma. If submucosal fibroids with an intracavitary component are suspected, saline infusion sonography should be done. If all imaging is inconclusive, an MRI is suggested before a myomectomy. Also, a hysteroscopy is used to visualize suspected submucosal uterine fibroids and to biopsy or resect small fibroids. This case study is intended to inform medical professionals of the rising prevalence of uterine leiomyomas and become aware of its implications.

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