THE POLITICS OF CONSUMER VR: FRAMING CONTEMPORARY VIRTUAL REALITY

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Abstract

Positioning this dissertation as a technofeminist inquiry, I examine discursive tropes and ideologies that are constructed and/or mobilized by industry leaders from multinational corporations like Facebook and Google as they tout the revolutionary, democratizing, and/or emancipatory potential of consumer virtual reality (VR). Identifying themes from sources dating from 2012-2018, a timeframe that precedes and follows the launch of consumer VR, I employ a frame analysis to document some of the ways that this 'new' technology is interrelated with the power and politics of its mediations. As my frame analysis seeks to illustrate major trends and strategies, I also provide a case study on Palmer Luckey, founder of Oculus VR, to show the consequences of discursive frames that can begin with a seemingly innocuous call for games in VR amid the antifeminism of gamergate and the racism of alt-right neo-Nazis. My data relies on particular actors (companies, individuals) and events (industry conferences, highly reported controversies) from a complex digital communication landscape that includes developer blog posts, news media, promotional media, videos, and talks at developer conferences published online. In most cases, sources were selected because they feature an industry leader whose views purportedly represent a company's views (e.g., Mark Zuckerberg at Facebook, Palmer Luckey and Michael Abrash at Oculus, or Clay Bavor at Google). Throughout, I argue that industry leaders frame a problematic support of the status quo of technological design, entrenching marginalizing norms while establishing a consumerist desire to participate in this 'future.'

Acknowledgements

Back in 2012—an important year in the context of this dissertation—I did a collaborative project with some friends. I enjoyed the process so much that my parents suggested I build on that work for an MA. I thought I was done with school. Without my parents' patience and support, I don't think that I would have applied. By 2014, the MA became another collaborative project, which led to work for Dr. Ali Mazalek. Without her willingness to share the many projects that she manages, I don't think I would have considered research or design. Without the students and researchers at SynLab and RE/Lab, I don't think I would have proposed this dissertation. Without Dr. Jason Nolan and the generous way that he keeps his office door open, I would not have been able to navigate all that is left out between a classroom and a human being. Without the guidance of my advisor, Dr. Jennifer Jenson, and her ability to get so quickly to what matters, I would not have known where to begin in order to give this work the foundations it has. And without this doctoral work, I would not have sat next to another TA and would not have begun a particular friendship, which is also to say that without Brianna this would not have been as much fun. And of course this list could go on and on. I want to thank you all for helping me on these forking paths. I could not have done it without you.

Dissemination of the Dissertation

The following chapters of this dissertation have been published and/or contain published material from the following peer-reviewed papers.

Chapter 4 is an extended version of:

- Harley, D. (2019). Palmer Luckey and the rise of contemporary virtual reality. *Convergence*. https://doi.org/10.1177/1354856519860237

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- Harley, D. (2020). Virtual Bodies Inc.: Framing Corporate Mediations of Bodies in VR. *PUBLIC Journal: Arts Culture Ideas*. *30*(60), 10.

The Conclusion of this dissertation summarizes the following papers:

- Harley, D., Tarun, A., Elsharawy, S., Verni, A., Tibu, T., Bilic, M., Bakogeorge, A., Mazalek, A. (2019). Mobile Realities: Designing for the Medium of Smartphone-VR. *In the proceedings of DIS19, Conference on Designing Interactive Systems*. ACM.
- Harley, D., Tarun, A., Germinario, D., & Mazalek, A. (2017). Tangible VR: Diegetic tangible objects for virtual reality narratives. *In the proceedings of DIS17, Conference on Designing Interactive Systems*. ACM.
- Harley, D., Verni, A., Willis, M., Ng, A., Bozzo, L., & Mazalek, A. (2018). Sensory VR: Smelling, touching, and eating virtual reality. *In the proceedings of TEI18, the Twelfth International Conference on Tangible, Embedded, and Embodied Interaction*. ACM.

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Introduction - 'So very sure'

> It's a nice town, knowing its past, and sure of its future, as it makes ready for the night and the predictable morning. The desert blankets the earth, cooling, resting for the fight with tomorrow's sun. And in my house near the town, we're also sure of the future. So very sure.
>
> —Harry Essex, *It Came from Outer Space*

In 2016, Facebook founder and CEO Mark Zuckerberg shared an image of himself at an industry conference, smiling and walking confidently down an aisle (Zuckerberg, 2016). The seats are filled with people, but no one sees him. They are all wearing virtual reality (VR) headsets, watching kids play soccer, and oblivious to their immediate surroundings. The image, posted on Facebook, was quickly ridiculed as a dystopian fantasy—our techno-overlord walking discretely among us. Critics (e.g., McCormick, 2016) drew parallels to the '1984' Apple commercial (see Taube, 2014), in which human drones sit helplessly in front of a giant screen watching Big Brother (inexplicably wearing two pairs of glasses—the better to see you with?) speaking about oneness and unity. In the commercial, Big Brother is interrupted by an athlete who charges down the aisle to throw a sledgehammer at his domineering image. The modern Zuckerberg version has no athlete. Instead, it shows big brother himself, strolling on through, looking delighted. But Zuckerberg does not represent the only power in the room. The image also implicitly shows who is excluded, offering an example of the homosocial spaces that would

seek to define contemporary VR: a roomful of men tasked with securing the future of this technology. The only visible woman in either image is the athlete, and even she was not invited.[1]

The smile on Zuckerberg's face is self-assured and confident. That same month, Zuckerberg reportedly said that he wanted a billion people in VR "as soon as possible" (Chaykowski, 2016, para. 8), and perhaps a room of people wearing headsets showed that it was happening. Two years prior, Facebook had invested over $2 billion (USD) (Durbin, 2017) to acquire Oculus, a company promising to create VR headsets for gaming. A subsequent partnership with Samsung and competition from Google, Microsoft, HTC, Sony, and other companies galvanized an industry push towards VR hardware and software. By 2016, consumer VR headsets entered the market, expanding the media landscape with VR films, games, music, sports, and social spaces (Dredge, 2016), including VR versions of familiar platforms like YouTube and Netflix. In 2017, Apple appeared to join the fray by revealing its first steps for VR integration (Lai, 2017). For those who shared Zuckerberg's enthusiasm, this proliferation of VR would not have been a surprise. In a Facebook post after the Oculus acquisition, Zuckerberg (2014) wrote, "Virtual reality was once the dream of science fiction. But the internet was also once a dream, and so were computers and smartphones. The future is coming and we have a chance to build it together" (para. 9). In this vision, VR is an opportunity, a 'dream' to initiate collective future-building. It is presented as a sure, inevitable future.

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[1] In 2004, Apple would rerelease the ad, this time digitally adding an iPod clipped to the athlete's shorts, earbuds dangling from her ears. Even this is reminiscent of Orwell's warnings about changing the printed past to conform to the current ideology of the ministry:

> This process of continuous alteration was applied not only to newspapers, but to books, periodicals, pamphlets, posters, leaflets, films, sound-tracks, cartoons, photographs—to every kind of literature or documentation which might conceivably hold any political or ideological significance. Day by day and almost minute by minute the past was brought up to date. (Orwell, 1949/1977, p. 38)

In the years preceding and following the launch of consumer VR, Zuckerberg and other prominent representatives of corporations (e.g., Palmer Luckey and Michael Abrash at Oculus, or Clay Bavor at Google) would seek to define how VR is imagined, touting its revolutionary, democratizing, and emancipatory potential. This dissertation examines the ways that industry leaders frame contemporary VR in order to better understand the silences, limits, and absences (Hall, 1984) of their claims. With data consisting of contemporary articles, interviews, and publicly available talks, my research will address the following question: *How and why do industry leaders (e.g., at Facebook, Google, or Oculus) construct and/or mobilize particular discursive frames about virtual reality, and what are some of the implications of these constructions?* As the corporations that invest in VR continue to expand their reach with global ambitions (e.g., Zuckerberg, 2017a) and global implications, including reports of data breaches, problematic labour practices, and hate speech (see e.g., Cadwalladr & Graham-Harrison, 2018; Fung, 2019; Hern, 2019; Solon, 2018; Wong, 2018), this research contributes a critical, interdisciplinary analysis of the frames that shape consumer VR, situating industry discourse within networked contexts that continue to perpetuate discriminatory norms.

With the recent promotion and production of mass-market VR, research into the social and cultural impact of VR is timely, and scholarship in the social sciences and humanities has begun to examine the multiple interdependent dimensions of VR in its present form (Foxman, 2018; Golding, 2019; Kennedy and Atkinson, 2018). For example, Mandy Rose (2018b) calls for an examination of the ethical contours of contemporary VR, briefly referring to current, troubling unknowns about psychological effects, data gathering, and military use (topics I return to throughout this dissertation). While media scholarship has begun to propose an ethics of contemporary VR (e.g., Fisher and Schoemann, 2018; Nash, 2018; Spiegel, 2018), analyses of

nonfiction content and the affective potential of the medium are perhaps more prevalent (e.g., Irom, 2018; Leotta and Ross, 2018; Nielsen and Sheets, 2019; Raessens, 2019). With the relatively widespread use of VR for documentary media (Bevan et al., 2019), including work produced by news organizations like *The New York Times* (see e.g., *The Displaced* [The New York Times, 2015]) and *The Guardian* (see e.g., *6x9* [The Guardian, 2016]), it is unsurprising that media scholars should examine nonfiction VR. However, this scholarly work does not account for how or why industry leaders promote VR, and it largely ignores the other current uses of VR as a platform, such as for video games. With game developers and players targeted as one of the first audiences for consumer VR, there continues to be very little research into how these cultures and contexts might affect contemporary VR. Given the ongoing discrimination across video game cultures and the technology sector more broadly (e.g., Chess and Shaw, 2015, 2016; Cross, 2014; International Game Developers Association [IGDA], 2018; Matney, 2017a; Myers, 2018; Richter, 2018), my research is also an attempt to incorporate these networked, sociopolitical realities into the study of VR.

It is also significant that these current forms of discrimination reflect much longer histories. For decades, feminist and other critical work has identified the systemic barriers and oppressions that the tech industry presents to women (Cockburn & Ormrod, 1993; Wajcman, 2010), people of colour (Nakamura 2008, 2012), people with disabilities (Cole et al., 2011; Johnson, 2019), and other diverse identities (Costanza-Chock, 2018), representing multiple axes of discrimination (Collins, 2019). Scholars across feminist science and technology studies (feminist STS, or technofeminism) argue that the power and politics that a technological system represents is often visible in the male-dominated control over many of its constituent parts, including its research, development, and marketing (Cockburn, 1997, 2009; Cockburn &

Ormrod, 1993; Wajcman, 1991, 2000, 2004, 2010). I position this study as a technofeminist inquiry in part to reflect on the lessons of this history, and perhaps especially the lesson that the values that a technology 'embodies' are never fixed: "[f]or technofeminism, politics is an 'always-already' feature of a network, and a feminist politics is a necessary extension of network analysis. Science and technology embody values, and have the potential to embody different values" (Wajcman, 2004, p. 126). When the values of a given network maintain or perpetuate unjust systems of power, a technofeminist analysis is also an effort to identify opportunities for equitable change. Despite the future-oriented gaze that is so common with 'new' technologies like VR, it remains important to look to the past.

Throughout this dissertation, I will argue that the corporate ambitions that undergird claims that VR offers 'new' and/or 'innovative' opportunities for companies and organizations reveals gendered, racialized, classed, and able-bodied mediations. The presumed newness of VR is one of the contradictions of this contemporary moment. In spite of the celebratory declarations of innovation and discovery, VR is an old technology, entangled within interrelated histories of computers, the military, capitalism, surveillance, digital games, and discrimination. The decades of scholarship about its application have been followed by decades of scholarship about its use. What is fundamentally new about contemporary VR is not that there is suddenly VR. What is new is the corporate interest, with billions of dollars invested. As the 'new' technologies of VR are promoted with the promise of greater social access and opportunities to communicate with friends, families, and communities, multinational corporations gain new forms of access and insight into consumers' everyday lives, raising concerns about data privacy and ethics. In this sense, VR is an old tool that offers new ways to extend discriminatory structures and institutions,

as well as new ways to normalize and consolidate an increased collection of personal and public data.

Dizzying Dreams of the Future: Initial Motivations

In addition to its decades of research and development, VR has a long history as an artifact of the imagination. It was featured in the dystopias of film and literature long before becoming a corporate promise of the future, and even now science fiction offers initial motivations. For industry leaders like Michael Abrash and Palmer Luckey, descriptions of virtual worlds in books like *Snow Crash* (Stephenson, 1992) and *Ready Player One* (Cline, 2011) are cited as inspiration. I can trace my own interest in VR to Nintendo's Virtual Boy. All it took was a picture in a magazine in the mid-1990s. I never tried it and never felt the need to. I am not sure whether I ever had access to it. Some things are better left unknown: for me, imagining the possibilities of VR was enough. It disappeared after only a year and no one that I knew ever spoke of it again. Today, it is talked about as one of Nintendo's few failed products (Murphy, 2016). Recalling such precedents provides useful indications of the ways that VR has changed, and the ways that it has not.

For the purposes of this dissertation, when I refer to VR, I will be referring to any stereoscopic headset like the Virtual Boy, mass-marketed and mass-produced. Chapter 3 will expand this definition of VR to establish a much longer history, suggesting that the historical precedents of today's VR—in some cases dating back hundreds of years—continue to offer a lens to better understand the mediations of today's visualizing technologies. But the common denominator of contemporary VR is the mediation of the device: a headset that supplants one vision for another. It is not an accident that Oculus is the Latin word for eye; even the Virtual Boy wanted our eyes. There is an American advertisement from 1995 that shows the Virtual

Boy, gigantic, rising up from smoke to stalk a human across a jagged hell. In the voiceover growl of a movie trailer, a man says, "It came from the third dimension. With its own brain. Its own voice. Its own legs" (Nintendementia, 2017, 00:01). The legs are long, metallic, and bird-like. For a moment, the viewer sees what the console sees—an infrared view of the world with a reticle that zooms in on its target, a person, who is caught for a moment in its gaze before escaping. The voiceover continues, "There's only one problem. It needs your *eyes*!" (Nintendementia, 2017, 00:15) It catches the human in its sights and shoots something that lassos around their torso: the cord of a game controller, now reeling the person into a swampy pit that's a radioactive green, locking their face against the Virtual Boy headset.

If I had seen this commercial at that time, it probably would have terrified and thrilled me. It still does, a little, but now particular aspects feel strangely prescient. The name of the product reflects regressive notions of who might be inclined to use this technology; today, the image of the VR user is still coded male (Golding, 2019). In 1995, the Virtual Boy needed my eyes; in 2017, the Chief Scientist for Oculus, Michael Abrash, called eye-tracking one of the 'grand challenges' of modern VR, made difficult because of 'problem pupils' (Abrash, 2017). In 1995, the Virtual Boy stalks and catches a person of colour; in 2018, Palmer Luckey, the young, white man who helped to bring VR to the mainstream, would excitedly describe his new company Anduril and their use of VR and AI to track and capture people crossing the US-Mexico border (Levy, 2018). And yet, I can also see that these are perhaps tenuous threads. For me, the glimpse of the world as seen by the console can even connect a line of ad copy—"It came from the third dimension" (Nintendementia, 2017, 0:01)—to the cyclopean creature in *It Came from Outer Space* (Alland and Arnold, 1953). In the movie, as the creature floats forward, it is often represented by its gaze, by the camera itself. It looks out at the characters of the story,

which means that the audience also looks through its watery eye. For the audience, the camera becomes an eye. The camera becomes a monster, and the vision that it grants the viewer is monstrous.

As tempting as it is for me to recall and reflect upon the warnings of science fiction, this work started with what I thought was a simpler, more direct question: why would multinational corporations choose to promote a product with so many known risks? This, too, is a common denominator of contemporary VR. Each headset warns against a startling amount of negative effects. Among the possible reasons that the Virtual Boy failed as a product, there were the warnings listed in the instruction booklet. For example, "If you or your child experience any of the following symptoms: dizziness, altered vision, eye or muscle twitching, involuntary movements, loss of awareness, disorientation, or convulsions, DISCONTINUE USE IMMEDIATELY and consult your physician" (Nintendo, 1985, p. 1, original capitalization). Note the similarities in the list from the Oculus (2018a) health and safety document, three decades later:

> Immediately discontinue using the headset if any of the following symptoms are experienced: seizures; loss of awareness; eye strain; eye or muscle twitching; involuntary movements; altered, blurred, or double vision or other visual abnormalities; dizziness; disorientation; impaired balance; impaired hand-eye coordination; excessive sweating; increased salivation; nausea; lightheadedness; discomfort or pain in the head or eyes; drowsiness; fatigue; or any symptoms similar to motion sickness. (p. 2)

Comparing these warnings, the possible side effects of using VR appear to be getting worse. 'Discomfort or pain in the head or eyes' is a symptom that strikes me as especially broad,

particularly for an object that is meant to be worn on the head with a screen in front of the user's eyes. The breadth of these negative symptoms is jarring amidst the discursive promise of VR.

I recognize that lists such as these are likely written by lawyers and for lawyers, boilerplate text to minimize liability in case people dizzily smash into walls while wearing a VR headset. But the lists are so long because very little is understood about symptoms collectively called simulator sickness, or cybersickness, other than the fact that these symptoms can be caused by VR. In their review of academic literature on cybersickness, Lisa Rebenitsch and Charles Owen (2016) are motivated by a "growing concern about the safety of these [VR] systems" (p. 101), calling it a "public issue" (p. 102). Rebenitsch and Owen contend that there is a lack of empirical data, in part because the effects of cybersickness are polysymptomatic and polygenetic, i.e., there are many possible symptoms and these symptoms will vary across individuals. Further, they write that there are four disparate theories that undergird cybersickness research, and because there is not enough testing across different headsets, there is a lack of clear recommendations for VR design. Simply put, while these adverse effects can be minimized, they cannot be eliminated. The lists are long because there is no comprehensive solution—and corporations selling VR hardware know this.

This was the state of academic research at the release of consumer VR, and it continues to be the case today: the risks are known, but comprehensive mitigation strategies are unknown. Although academic studies on cybersickness come with potential limitations as to what content is tested, how it is tested, and on whom, the most recent studies about consumer-level VR continue to corroborate evidence that VR increases the chance of cybersickness compared to desktop displays (e.g., Yildirim, 2019). As consumer headsets were released, industry leaders downplayed the problem. In response to possible health risks, Chris Milk, who popularized the

notion that VR is an 'empathy machine,' said, "I've watched more V.R. than most people, and I don't feel like I have brain damage" (quoted in Chafkin, 2015, para. 44). In an interview at the Code conference in 2015, Oculus CEO Brendan Iribe[2] was asked the following question: "Where do we stand now, where are we on the sickness question, the nausea, the balance question, the vertigo question?" (Recode, 2015, 18:00) Iribe smiled and responded:

> Good question. This is gonna be an ongoing effort that we are constantly working on, how to make this more and more comfortable. And in the company, you'll hear me have said many times that I'm the most sensitive in the company. I'm one of, I think—actually now that we're part of Facebook Sheryl Sandberg is more sensitive than me, we've proven that—and, but, but I am very sensitive to disorientation, moving around. The latest version, the version that we took a long time to really try to get right to ship for consumers, I've been able to enjoy for two and a half hours straight, playing one of the most recent games. I did not expect to play for two enough hours in V1. The fact that we've gotten it that good this fast I really believe over the next four to five years we'll get to a place where the disorientation nausea is no longer a challenge. That's behind us, and we're embarking on new challenges. (Recode, 2016, 18:11)

Iribe's response illustrates how concern is mitigated through the language of progress and possibility, and that the possibility of the consumer's cybersickness is something that must be suffered for the sake of the technology for the next several years. Like Chris Milk's statement, it

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[2] The three co-founders of Oculus would each depart the company in the years after the Facebook acquisition: Palmer Luckey in 2017, Brendan Iribe in 2018, and Nate Mitchell in 2019. Though Luckey's departure is somewhat different because of the controversy (see Chapter 4), such departures are not uncommon. The heads of Instagram and WhatsApp also left shortly after their respective companies were acquired by Facebook (Matney, 2018b). Examining the reasons for these departures, or common features in the kind of control that Facebook exerts may warrant future work.

also includes the questionable notion that these relatively young white men—who are already invested in VR—should be the metric by which technologies and other bodies are measured.

At the very least, the warnings that accompany VR headsets indicate that corporations are aware of the ongoing risk of possible symptoms, and that they are satisfied that they have done enough to manage or negotiate those risks. More accurately, perhaps, it was not considered to be their problem. A 'draft document' of best practices for VR design released by Oculus in 2014, "pending legal and medical expert review" (Yao et al., 2014, p. 1), includes about two dozen academic references to display optimization, motion sickness, etc. By 2016, the best practices document was longer, and now explicitly included the notion of responsibility—but not on the part of the corporation. The burden of an unsolved technological problem was laid at the feet of the developers: "Developers are responsible for ensuring their content conforms to all standards and industry best practices on safety and comfort, and for keeping abreast of all relevant scientific literature on these topics" (Oculus, 2016b, p. 4). The current best practices (Oculus, 2019a) begin by announcing that 'VR is awesome' before stating the following:

> There are still aspects of VR that haven't been studied enough to make definitive statements about how to make a comfortable experience for all users. Simply following the recommendations in this guide does not guarantee a comfortable or enjoyable experience. Iterative user testing of your content is critical. We count on you, the community of Oculus developers, to provide feedback and help us mature these VR best practices. (para. 5)

According to this statement, it is not the company's responsibility to ensure that the medium is 'studied enough to make definitive statements' about player comfort. It is the responsibility of the 'community' of developers ('we count on you') to 'mature' collective design knowledge. For

corporations, even if it is known that the headset can cause cybersickness, and even if it is known that 'a comfortable experience' is not guaranteed, player comfort is apparently the responsibility of developers.

Ultimately, however, it is the player who bears the brunt of managing the inevitable risks of cybersickness. The current health and safety warnings for Oculus (2018a) clarifies where the responsibility really lies: "Along with the freedom to explore your virtual world come additional responsibilities for you to have a safe experience" (2018a, p. 2). In other words, for the player, in addition to the cost of the hardware and software, the cost of the virtual world is also the risk of dizziness, sickness, discomfort, etc.; it is a price that the player must pay for the 'freedom' to experience the virtual world. It is just this kind of discourse—this kind of promise—that characterizes contemporary VR. The example of cybersickness—an unsolved problem identified decades ago—demonstrates not only how a corporation disperses the responsibility of player comfort, but also that the corporate goals for VR remain elsewhere.

A Brief Note about Position

As I began looking for the industry response to cybersickness—which appeared lacking—I saw, again and again, who was positioned to represent this 'new' industry. Watching talks that predominantly featured Western, able-bodied, white men, I repeatedly saw a kind of mirror image of myself. It was as if to affirm that I am their audience: as a consumer because of the shared interests and cultural references, and as a designer because of my work with 'emerging' technologies for interactive storytelling. It was as if to affirm the presumed validity of my subject position—a white cisgender male working within a space that excludes even as it promises inclusion—and the similarity of my subject position to the hegemonic norm of the tech sector. I am not pointing this out to assert that I have nuanced epistemic insight into their efforts

or ambitions, or to exempt myself from an analysis of their power. As I strive to work from a 'situated' (Haraway, 1988), intersectional feminist perspective (Crenshaw, 1989, 1991; Collins, 2015, 2019), I recognize that I am entangled in this discourse when I design for VR, even as I attempt to question who and what is dominantly represented within this industry. Challenging this discourse is necessary, but it is also a limitation of this research. Focusing on dominant voices can unintentionally intensify the silence of those who are not represented in the sector or within this research.[3] As England (1994) points out, reflexivity and transparency may make me more aware of my positionality within potentially asymmetrical relationships, but rather than remove that asymmetry, these efforts reveal the "limitations and partial nature of that research" (pp. 250-251).

I rely on feminist theory in part to highlight the decades of technofeminist scholarship that identifies systemic levels of oppression in the tech sector, but also because the recommendations and alternatives that can be found within feminist scholarship continue to offer vital lessons for change. Racial and gender-based discrimination are ongoing problems in the tech industry (see e.g., Parker and Funk, 2017), and reportedly affects 50% of women in STEM jobs (Funk and Parker, 2018). Challenging discriminatory norms cannot fall exclusively on the shoulders of those who are most in need of change: those already represented by and representing the tech sector will also need to contribute to this work, taking on these problems and initiating change in ways that go beyond simple allyship (see Gay, 2016). As Sara Ahmed (2017) explains, the messy, difficult labour of living within and reconfiguring the norms of

[3] This is, incidentally, one of my reasons for describing images and other visual material in this dissertation. The hype of today's VR is a recurring theme, and I want to avoid displaying industry leaders and the hardware that their companies sell, in part because their promotion appears to rely on the ubiquity of images showing particular industry leaders and particular VR headsets. If I did reproduce images of the industry leaders that I discuss in this dissertation, one key factor would stand out: they are all white men.

particular institutions is 'diversity work' that disproportionately falls on those already affected by the unequal relationships that are upheld by a white heteropatriarchy. While much more scholarship is necessary to intervene on the unequal structures and systems that support contemporary VR, including more visibility to those who have been left marginalized by those structures, this research is an attempt to contribute to work that identifies opportunities for equitable change.

Selective Virtual Reality: Choosing from Possible Worlds

If this dissertation were about VR discourse in the 1980s, there would be a chapter on Jaron Lanier instead of Palmer Luckey. In his recent book, *Dawn of the New Everything,* Lanier (2017) describes how he popularized the term 'virtual reality,' and how he attempted to commercialize VR with a company called VPL technologies. Although the details of Lanier's work and the company's rise and fall are beyond the scope of this dissertation, it is important to point to his story as a reminder that similar debates about this technology—similar dreams, similar fears—have all happened before. Even some of Lanier's battles are repeated. Near the beginning of his book, Lanier (2017) has a conversation with his younger self:

> *What's going on with virtual reality? Is it even called VR?*
>
> Yeah, most people call it VR now.
>
> *You mean we won the terminology war?*
>
> No one remembers or cares about that war. It's just words. (p. 5, original italics)

As if to celebrate the end of this 'war,' Lanier offers fifty-two definitions of VR throughout the book, covering a wide range of technologically-mediated experiences. The many definitions appear to express the many possible worlds of VR. And yet, while choosing Luckey over Lanier

is primarily an effort to reflect the contemporary moment, choosing how to define VR, especially now, is complicated by the influence of corporations.

As consumer VR hit the shelves in 2016, Brenda Laurel (2016), a researcher known for her VR experiments in the early 1990s, called for a more exacting definition of VR:

> Virtual Reality is everywhere again, and that's a problem. Almost immediately after the new trend began, people started shopping 360° immersive video as VR. It is not. "Surround" movies are marketed as VR. They are not. "VR Storytelling" is a misnomer; it is not structurally VR. "Second Life" is described as VR. It is not. When the term is appropriated, its meaning disintegrates. Last time around, the same effect spread out across media types that are not VR. There is no such thing as "desktop VR." Application of the term "VR" to a CAVE experience is questionable. When we use the term just because it's sexy, its meaning spreads like an oil slick over our media and dilutes it such a degree that we no longer know what it means — think "turbo." (para. 1)

While I agree with Laurel that distinctions are important—for content creation and for analysis—for the purposes of this dissertation, the crucial point embedded within Laurel's complaint is how the meaning of VR changes and 'dilutes.' These kinds of changes raise questions: who are the people promoting these trends, who is promoting this language, and who considers it 'sexy'? Or, encapsulating these questions, how is the definition of VR slipping away from those who first tested its possibilities, and into the hands of corporations like Facebook and Google? What are the implications when corporations gain the power to define VR?

Given my focus on industry leaders, my interpretation of what VR is aligns with what appears to be their definition of VR. For industry leaders, VR is defined by the headset, a visual apparatus that provides (primarily) visual stimulus, which in turn stimulates the proprioceptive

and vestibular systems as well as physical sensations. Whatever the headset is used for—whether it is for film, games, social media, broadcast sports, news and events—it is understood to be VR. No matter the content, it is often characterized as an 'experience': "The VR industry has begun to use the term 'Experience' to describe individual works although other terms such as videos, films and games are also used" (Leotta and Ross, 2018, p. 160). The term 'experience' is so pervasive in VR discourse that it is difficult to avoid. I fall into the trap of using the word to help specify that I am referring to VR rather than other media. It is useful because there is no easy noun to specify the medium as there is with 'film' or 'game.' But it is a trap, because unlike nouns used for other content, 'experience' implies something gained, something lived, something direct. The idea that VR provides an 'experience' elides the mediation of that experience. It obfuscates the technology.

Discourse that presents VR as a non-mediated experience is so common that it is among my motivations to temporarily forgo the nuances between headsets and content in order to draw more attention to the headset as a mediating object. As Kennedy and Atkinson (2018) point out, "The same goggles that enable VR also facilitate the viewing of these 360-degree videos and images, hence the ontological confusion between them" (p. 3). My own sense of ontological confusion is worsened whenever the headset is said to 'disappear.' For example, in a recent book by Samuel Greengard (2019) for the MIT Press Essentials Series begins with an account of Jeremy Bailenson's Virtual Human Interaction Lab at Stanford University, known for its VR experiments in behavioural psychology. Greengard quotes Bailenson, who claims, "VR [virtual reality] takes all the gadgets away, it takes all the multitasking away and you actually feel like you're with someone" (Greengard, 2019, p. xiii). Although Greengard writes, "It's impossible to

argue with Bailenson's conclusion" (p. xiv), wearing a VR headset does not make the headset disappear. Wearing a headset does not make 'all the gadgets' disappear.

Identifying a headset as object-that-is-said-to-provide-VR, rather than distinguish differences between types of VR, raises questions about corporate influence and control. Questions about the headset's mediation become questions about the corporation's ambitions. In early March 2014, only a few weeks before Facebook would acquire Oculus, an article in the MIT Technology Review declared that "VR is heading back into the mainstream" (Parkin, 2014, para. 3), and contrasted Oculus founder Palmer Luckey's assertions about the 'revolutionizing' potential of the technology with Jaron Lanier's reservations:

> Lanier, the father of VR, is more equivocal about the moral, ethical, and political future of VR. "The tech itself lends itself to a wide variety of different frameworks," he says. "If it's used as a spying tool or a way to make advertising work more effectively, then it will gradually hurt people. But if it's used as a way to help people know themselves more, and if the person is the power center rather than the remote company, then it will aid education and can be joyous and beautiful" (para. 19)

After Facebook invested its billions to compete alongside other major companies making their own push into VR, it is perhaps clearer that corporations now occupy the 'power center' of VR, attempting to define the technology and its use. If the headset is one of the common denominators of contemporary VR, corporate influence is another.

Into a Flurry of Hype: Chapter Outline

Given the reach and influence of multinational corporations and the hyperbolic declarations that VR would 'change the world' (Abrash, 2015; Milk, 2015; Stein, 2015), the

primary contribution of this dissertation is an analysis of industry-led discourse about VR between 2012 and 2018. I build on recent work, like Maxwell Foxman's (2018) dissertation, which also examines VR discourse, though from the perspective of enthusiast 'early adopters' who saw a potential in the technology and devoted their time and energy to shape the medium. There are necessary overlaps in our work but one important distinction is that the early adopters that I refer to here are those who were first in the room: industry leaders and developers promoting these technologies at exclusive conferences, and those who would go on to promote these technologies at other exclusive events. To analyze these networks is to ask questions about how systems of power persist; in doing so, I hope to highlight possibilities for interventions, to find alternative paths, and to identify how interventionist strategies might apply not only to VR but also to the next 'new' technology.

Chapter 1 reviews the relevant literature in the field, focusing on scholarship from the humanities and social sciences dealing with videogames and with VR. Although there is a lack of research in games studies about contemporary VR, videogames were one of the first consumer markets for VR. Game designers were among the first to create content, and industry leaders envisioned gamers as early adopters. Video game scholarship, especially within the last decade, continues to document the inequalities of the culture and industry of games. If the VR industry inherits the problems of the games industry, it inherits the racism and sexism of the industry (e.g., Bryant, 2016), the racism and sexism of the content (e.g., Mafe, 2015), and the racism and sexism of other players (e.g., Gray, 2014). Since games scholarship could only turn to VR after it entered the consumer market in 2016, I then turn my attention to VR scholarship that has a slightly longer history: VR for documentaries and other 360-degree film. The tenor of these

streams of research is different, but each offers something to the analysis of contemporary VR—a medium that is never one thing, but whose corporate influence remains a common factor.

Chapter 2 surveys the theoretical foundations that ground this study, relying particularly on feminist work in science and technology studies. Cynthia Cockburn (1997), for example, calls for academia and industry to grant more attention to the multiple contingent factors within and beyond the life cycle of a technological artifact in order to better understand how technologies establish particular forms of power and maintain unequal relationships. I use the example of Facebook to put this theoretical work into practice and to ascertain how the politics of VR might begin to account for distributed networks of power that engender particular social and political arrangements. Although these technofeminist perspectives provide a foundation for the dissertation as a whole, I apply them more directly in Chapter 5. I follow these theoretical considerations with methodological considerations, detailing the scope of the study and my use of frame analysis in Chapter 3 and 5, and a case study in Chapter 4.

Chapter 3 is the first of two chapters to employ a frame analysis to analyze industry-led VR discourse. I examine the notion of newness, identifying and analyzing narrative tropes employed by industry leaders like Clay Bavor, Palmer Luckey, Mark Zuckerberg, and Michael Abrash. Along with the claims of newness, tropes about '(r)evolution' or 'pioneers' and the 'wild west' help to establish and normalize two key ideas: first, how contemporary VR is slated to fit into the history and future of computing, and second, who is tasked with ensuring that this future is realized. There is a danger in this kind of history-writing: the presumed inevitability of VR is overlaid with the presumed inevitability of a male-dominated workforce. Writing a history of the future is a means through which power remains the same, canonizing particular 'innovators' over others, and making other aspects of the history invisible. As an intervention, this chapter

concludes with a rewriting of the history of one 'father' of VR, Ivan Sutherland, by including the systems of gendered and racial exclusion that made his rise possible, and the military-industrial complex that financed him.

Chapter 4 provides a more detailed examination of one industry leader: Palmer Luckey, founder of Oculus and purported 'face' of VR. This chapter develops a case study centred on Palmer Luckey to examine the rise of contemporary VR within the overlapping, contemporaneous contexts of video game culture and the misogynistic gamergate movement. The initial promotion of VR as a medium for games and gamers is also an attempt to establish who would be the first to develop for these technologies and who would be the first to use them. Through the example of Luckey, I examine the links that connect this framing of VR as technological progress to the misogynist rhetoric of gamergate and the xenophobic rhetoric of alt-right nationalism. As gamergate expanded its scope with far-right political fervour, Luckey's political ambitions also expanded in scope. Within this context, Luckey's promotion under the banner of 'progress' serves to reify a white, male status quo that is both established and contested within cultures of technological development.

Chapter 5 returns to frame analysis to broaden the perspective again, now asking more fundamental theoretical questions about the ontological and epistemological standpoints that industry leaders adopt in their promotion of VR. Whether implied or stated outright by industry leaders, these theoretical frames help to explain how and why the promotion and sale of VR is also the normalization of an increase in corporate data collection. The theoretical paradigm that frames contemporary VR has implications for privacy, surveillance, and corporate-military contracts, and its broad applicability suggests it may be applied to the next 'new' technology—so long as that new technology also expands the kinds of data that corporations collect.

I conclude with a reflection on future work, using my design work at Ryerson University to demonstrate how design-based interventions offer a way to challenge the 'state-of-the-art,' to critique through design. In this collaborative work, I lead small teams of undergraduate and graduate students through the design and implementation of proofs of concepts and prototypes in order to question taken-for-granted assumptions in VR design. The first of these projects offers ways to bring physical, interactive objects into VR stories, challenging an otherwise ocularcentric approach; the second offers non-digital solutions to sensory experiences in VR, challenging an otherwise technocentric approach; and the third draws on a variety of digital and non-digital storytelling traditions to cross virtual and material environments, challenging an approach that begins and ends the experience within VR. My goal in reviewing my design work is to draw connections across this work that can be applicable to other technologies and other media. While VR has received so much attention and has been supported by such hype, it is only one technology among many, an object that is temporarily held up before another takes its place. In this sense, interventions require both the specificity of application and the generalizability of criticality. I conclude the dissertation with a brief review of feminist coalitional work to rearticulate its urgency within the tech sector.

The analysis in this dissertation stands to contribute critical perspectives to scholarship that situates VR within the complex, dynamic structures of markets, changing hardware, and changing regulations of multinational corporations. The discursive 'newness' of VR (despite 60 years of research and implementation) represents a critical time for this research. Applying a technofeminist lens to VR is a reminder that these theoretical considerations can be a lens to analyze other 'emerging' technologies, such as augmented reality (AR), artificial intelligence (AI), or 5G technologies, offering perspectives that bring attention to responsibility in design and

to the ways that unequal power configurations can change. Again, this moment of newness is important: “New technologies are malleable, but they also reveal continuities of power and exclusion, albeit in new forms” (Wajcman, 2004, p. 54). Resisting or challenging the new forms of power that VR represents, especially now as it becomes more standardized, requires a better understanding of how, what, and who its networks include or exclude.

Chapter 1 - 'Goggled in': Literature Review

> "You spend too much time goggled in," she says. "Try a little Reality, man."
> "Where we are going," Hiro says, "we're going to get more Reality than I can handle."
>
> —Neil Stephenson, *Snow Crash*.

Introduction

While any attempt to review VR research must limit its scope, the range of disciplines affected by VR indicates that an examination of the impact of contemporary VR will require an interdisciplinary view. Recent metareviews present a long history in which VR has been researched and applied in a variety of contexts: as a tool for training simulations (e.g., Gavish et al., 2015), rehabilitation (e.g., Howard, 2017), and education (e.g., Freina and Ott, 2015); VR is applied to experiments in psychology and for mental health (e.g., Turner and Casey, 2014; Valmaggia et al., 2016); and it is used to tell stories and to create experiences for games, film, and other forms of mass market media (Bevan et al., 2019). The relative affordability of today's headsets and modes of production has led to an increase in this research as well as an increase in its possible applications. Yet according to Maxwell Foxman (2018), even though "VR literature is almost *too* vast" (p. 17, original italics), there is very little research "surrounding Communications and social adoption of the medium" (p. 19). Because consumer VR headsets like Oculus Rift, HTC Vive, and Playstation VR were released in 2016, an examination of the social, cultural, and political impact of today's devices has just begun.

This chapter peeks over the disciplinary hedgerows that might otherwise separate games studies and documentary film studies to situate the contribution of this dissertation and to demonstrate the need for interdisciplinary perspectives. If early adopters are mainly using VR for games and film (Foxman, 2018), research in these two domains might serve to inform and

contextualize a cultural beginning of mass-market VR. These early adopters do not draw rigid boundaries to define what VR is or is not. Sometimes it is used for games, sometimes for film. Either way, it is VR. As such, my focus continues to be on headset-enabled VR, for now making no explicit distinction between content using 360-degree video and content using computer-generated imagery (CGI). Indeed, the lines between the two are muddy, as content that relies on video might still use CGI, and content using CGI might use audio captured from real locations and people (Bevan et al., 2019). The common factor is the headset and the corporations that manufacture them; games and documentary films are simply two possible uses of the platform.

I begin by reviewing feminist analyses of games and games culture that document inequality and the perpetuation of sexism, racism, and other forms of discrimination. While my review of games scholarship is not specifically about VR, it is an attempt establish some of the social and political parameters of the culture that may shape VR as a platform for games. I follow this discussion with a review of the 'immersive turn' (Rose, 2018b) in film and documentary media, in which declarations about the potential of VR as a medium (and particularly its possibility for empathy) are tested and critiqued, leading to a consideration of some of the ethical dimensions of the medium. This scholarship, describing unequal access, discrimination, and bloated claims about the power of VR, help to contextualize the industry discourse examined in this dissertation. I conclude the chapter by reflecting on how and why this interdisciplinary perspective is important for the study of the politics of contemporary VR. While more research is certainly needed to examine how mass-market VR is produced and consumed, current research in documentary film and games studies provides ample evidence to be skeptical of claims from Oculus or Google that now, finally, 'VR is for everyone' (Oculus, 2018b; Pierce, 2016).

Feminism in Games: Stepping into the Ideologies of Play

In an advertisement for the Oculus Rift and its catalogue of new VR games, the soon-to-be-immersed look up from phones, from food, or look outdoors before they 'step into the rift' by putting on a VR headset (Oculus, 2017c). The advertisement evokes notions of the 'separate' space of games and their presumed ability to offer an 'escape from reality,'[4] while also echoing discursive efforts to distance the ideological facets of games with the misleading defence that games are 'just for fun' (Jenson and de Castell, 2011; Ruberg, 2015; Ruberg and Shaw, 2017). While scholarship in games studies has challenged this rarified, 'separate' space of games by highlighting the ideological bounds of games (e.g., Bogost, 2008, Consalvo, 2015, Flanagan, 2009), the effects of these configurations gains new urgency within feminist and queer orientations to games research, which document the ways that the ideology of games is very often one that is male-dominated, corporate, heteronormative, racist, and sexist. These social and cultural contexts provide an important backdrop to the landscape of contemporary VR, complicating its purported 'step' into virtual worlds and its promise of an escape.

Examining and emphasizing the material consequences of the virtual has been a recurring concern in feminist games studies. As Jennifer Jenson and Suzanne de Castell (2011b) argue, the repeated attempts to diminish the implications of "misogyny and violence … from the code on up" (12:40) are often rooted in a flawed dismissal of the sociopolitical realities of virtual worlds:

> We can't dismiss these as "only a game," or "only a virtual world." They're very much real worlds because the virtual and the material occupy the same lived space of inhabitation, unified as they all are by time. This is the brief span of lived time by which

[4] See Schell (2008) for an example of a popular game design text that uses this construction.

> we are contained, and by which we are all constrained. No matter whether we are taken up by material or virtual engagement we are in time and expending our time, and there's nothing more real than that simple existential fact. (23:15)

Linking the dismissal of 'virtual' misogyny with the dismissal of feminist scholarship, Jenson and de Castell (2011b) call for more transformative, interventionist research that does more than document—again and again—the 'secondary status of women and girls' across games and games cultures. This kind of interventionist work offers critical contributions to games studies, including, for example, a methodological and theoretical foundation to counter games discourse that 're-entrenches' gendered conceptions of play, whether in academia or beyond (Jenson and de Castell, 2008); a longitudinal study that challenges prescriptive norms about gender and gameplay by demonstrating the contextually and culturally situated gendering of play, as well as the importance of girls-only play spaces to counteract hegemonic forms of play (Jenson and de Castell, 2011a); an account of feminist organizing—research-based and community-based, offline and online—that explicitly seeks to counter the precarity that women face, offering 'public pedagogy' to 'talk back' to the violent misogyny and harassment in games culture (Jenson and de Castell, 2013, 2016); and an analysis of the successes and challenges of community-based feminist games organizing, in which activist work negotiates intergenerational, intersectional, and corporate contingencies while striving to create inclusive spaces of belonging (Harvey and Fisher, 2016).

As this scholarship demonstrates, examinations of (and interventions into) the exclusionary sociopolitical realities of games cultures go well beyond an analysis of content. Given the breadth and impact of more than two decades of games scholarship, in the recent collection, *Feminism in Play*, editors Kishonna Gray, Gerald Voorhees, and Emma Vossen

(2018) write that a feminist lens has contributed to an intersectional analysis of three key themes in games studies: "women and marginalized peoples' erasure or unfavorable representation in games, exclusion and harassment in game cultures and communities, and participation in the game industry and other sites of production" (p. 2). In order to illustrate these three themes, I will review a selection of recent games scholarship. Rather than attempt a comprehensive review, my aim is to show a glimpse of the cultures and contexts of video games—from representation to production—that are contemporaneous with corporate VR initiatives and the subsequent release of the major consumer headsets.

The first two themes—representation and exclusion—are evident throughout *Race, Gender, and Deviance in Xbox Live*, in which Kishonna Gray (2014) analyzes video game content, discourse, and deviance by focusing on the perspectives of women of colour. Gray argues that despite large demographics of minority gamers, the masculinist and sexist hegemonic structure of video game culture continues to marginalize and ignore their voices. Looking specifically at Xbox Live, Gray contributes to research devoted to making women of colour more prominent in games by examining "their experiences and their responses to oppressions" (Gray, 2014, p. xxiv). Gray provides an analysis of how games act as 'ideological projects' by strengthening dominant ideologies while ignoring the structures that cause them, both reinforcing and normalizing hegemonic ideals. For example, *Tomb Raider* sexualizes and makes its main character in constant need of rescue (c.f. Kennedy, 2002); *Grand Theft Auto V* stereotypes black characters and class differences between whites; and *Gears of War* promotes hypermasculine, hypersexualized black characters and fetishizes alternative forms of speech. In such narratives, non-dominant groups are 'othered' while reinforcing an implicit white male privilege. Games such as these act as ideological platforms for players to enact the forms of oppression that are

already present, which Gray shows by documenting the racism and discrimination in the real-time voice communication of Xbox Live.

Gray (2014) contends that the victims of these acts are 'deviants' for their refusal to accept or emulate the social norms of the space. These players are targeted through 'linguistic profiling,' leading to racist and/or sexist comments first through questioning and then provoking, which is amplified by the disinhibition of relatively anonymous voice-based online communication. Yet players whose identities are constructed along multiple points of oppression also create their own spaces as resistance to the racism, sexism, and classism that they face. Gray notes that although dominant discourse undermines their efforts, women have a history of empowerment through technology, using it for widespread communication, for community building, and for action or reaction. The challenge of resistance within Xbox Live is similar to those within other social structures, with some players normalizing discriminatory behaviour, others aggressively opposing it, and still others organizing against it. Although not identified as such, the book offers a strong argument against rhetoric that lauds the power of participatory culture, or that characterizes the Internet as an inclusive, emancipatory space. Gray's examination of Xbox Live demonstrates that structural and discriminatory forces exist within and across games, gamers, and game culture. Resistance to discrimination is possible, but it is also necessary to track and to analyze the process and tools of resistance, making marginalized bodies and resistant acts more visible.

An example of the third theme— unequal participation in the production of games—can be found in Shana Bryant's (2016) account of her experience working as a game developer. Bryant describes work environments that are so dominantly white and male, that the ratio of men to women when she enters the workforce, aged 22, was 300 to 2; two years later it was 350 to 9,

while the ratio of male to female managers was upwards of 40 to zero. Bryant writes, "Black women in tech are rare. And being rare, we're alternatively coveted and/or shunned" (p. 133). As the only black woman in the company, Bryant felt that she was both hypervisible and underestimated; though racism and sexism were sometimes explicit, it was more often implicit, causing "a constant layer of mental, emotional, and even physical stress," (p. 139) which would affect performance. Describing how she grappled with the exploitative objectification of being asked to appear in a disingenuous 'diversity' video for her company, Bryant writes:

> Your otherness will be exploited (in recruitment, in video, and interview footage), and it is hardly ever to your direct benefit. That said, there's some exploitation that's clear and necessary to evoke any change. Representation matters. Women help attract women. Minorities help attract minorities. Once companies get into the mindset of seeking diversity for its own sake as opposed to optics, it will be a moment when diversity efforts become meaningful. (p. 143)

The weight of responsibility in Bryant's account presents a compelling contrast to the experience of those who do not bear the same burden of representation. For Bryant, there was never an option to simply make games like her white, male co-workers. Seeking change within the industry made her exploitation 'necessary'—diversity became her responsibility.

Not only are women and other marginalized identities in the games industry rare, but so are their accounts of working within the industry. In their review of the 'public speech' of 190 women working in games, Suzanne de Castell and Karen Skardzius (2019) only found public statements for half of those women (49%). These statements, moreover, were often positive accounts. While on the surface these positive accounts appear to contrast academic scholarship that documents systemic discrimination, de Castell and Skardzius propose it may be more likely

that these accounts demonstrate "persistent 'silences'" (p. 10) in the games industry. Across the public statements, systemic barriers and biases are reconfigured as opportunities and oversights—women in the games industry recast negatives into possibilities for improvement, rhetorically demonstrating that they are allies rather than critics of the games industry. The 'affective labour' of these discursive strategies, akin to Bryant's (2016) problematization of diversity videos while participating within them, reveals the complex roles and relationships that women in the games industry feel that they must adhere to. For de Castell and Skardzius (2019), these silences may be a reason that there was no #MeToo movement in the games industry, even though it is clear there is a need for "interventions, policies, and practices that support women in games for whom, by now, enough really is enough" (p. 845). Driving this point home, in May 2019, the same month that de Castell and Skardzius's article was published, approximately 150 employees at the big-budget game company Riot Games staged a walkout, the largest walkout in the games industry, protesting a culture of sexual harassment and discrimination (Farokmanesh, 2019).

Although big-budget game companies like Riot Games often stand to represent the industry and its hegemonic norms, the culture of independent and self-produced games is not necessarily different. When games and players are limited by the normative hegemony of play (Fron et al., 2007), it creates a misguided idea of what games are and limits participation in the creation of content. In the case of queer games, for example, Alison Harvey (2014) argues that although independent games are often touted as experimental, inclusive, and critical alternatives to the mainstream, many independent companies uphold consumerist, normative values in their design, production, and play, each of which acts as its own separate barrier to access. While queer designers and players have some alternatives to the normative structures of game culture

through the use of free platforms like Twine, these designers "face a number of significant challenges, including the delegitimization and depoliticization of their work, the co-optation of their labour, and the risks entailed living within alternative, anti-capitalist economies" (Harvey, 2014, p. 95). Bonnie Ruberg (2019) echoes many of these same points when she asserts that for LGBTQ game designers, not only does their work involve a high degree of emotional labour as a possible target of discrimination and oppression, but despite the use of 'free' platforms, their work requires time, skilled labour, and material resources. As Ruberg's interviews show, the labour of marginalized developers—whose work is cast as 'diverse' as quickly as it is appropriated—is precarious, undervalued, and often exploited.

Given the global cultural importance of games as a multi-billion-dollar market, an underlying current in games scholarship has been the case for its wider cultural significance. For instance, in a popular TED talk, Jane McGonigal proposed that the problem-solving impetus in games and game design could be leveraged to solve real world "problems like hunger, poverty, climate change, global conflict, obesity" (McGonigal, 2010, 01:23). Although her work would later be critiqued as neoliberal ideology reconfigured as play (Kirkpatrick 2013; Ruberg and Shaw 2017), McGonigal (2010, 2011) was not wrong that the language of games as mass-market media had mobilizing potential. However, it was not in the way that she envisioned. When the gamergate hashtag gained prominence in 2014 and 2015, following a longer history of online sexism and misogyny in the games industry (Jenson and de Castell, 2013), the language of games was used to direct harassment and violent threats at Anita Sarkeesian, including labelling her a 'final boss' (Cross, 2016; Sarkeesian, 2012). As Jenson and de Castell (2016) suggest, "Violence against women is neither created nor destroyed—it just changes its shape" (p. 194). Video games, so often framed as apolitical, became an overt site for misogynist, antifeminist

backlash, demonstrating yet again that video game culture has a co-constitutive relationship with wider social and political contexts (Jenson and de Castell, 2011b).

While the oppression and marginalization of games is perhaps clearest in the harassment, violence, and threats that surrounded the gamergate hashtag, feminist games scholarship highlights a need for a closer examination of discrimination across the content, communities, and production of the games industry. Just as #MeToo and the other activist hashtags that preceded it indicate that sexual harassment and violence against women is not exclusive to the film industry (Jackson, Bailey, and Welles, 2019), critical approaches to games scholarship help to show that the discrimination and violence within games culture is not exclusive to the games industry. As corporations and developers promote VR as a platform for games and gamers, the debates and concerns of games scholarship become a necessary part of an analysis of VR. It is not only the differences in VR technologies that creates a need for new games scholarship, but also the ways that games culture now intersects with the material and discursive contexts of VR. As a platform, however, VR belongs to more than one industry. Responses to its current use for media production are more readily apparent in what is conventionally considered a separate research domain: documentary media studies.

Affording Empathy: Documenting the 'Immersive Turn'

In this section, I detail the academic response to the use of VR as a medium for journalism and documentary filmmaking, emphasizing the 'affordable empathy' (Irom, 2018) of VR that discursively targets a Western spectator. As with the previous section, the scholarship that I review here helps to establish the culture and contexts of contemporary VR, showing what kind of content is imagined for this 'immersive turn' (Rose, 2018b), as well as what is expected of its audience. Within this context, empathy rhetoric would discursively link affective responses

in VR with a reasonable expectation of truth from journalism and documentary media, establishing major themes for recent VR scholarship: empathy, responsibility, and the 'truth' of VR content.

Drawing on Lilie Chouliaraki and other critical examinations of humanitarian media, Bimbisar Irom (2018) argues that the discourse of VR's non-mediation, of its presumed realness, is an erasure of the politics, ideologies, and power dynamics in the representations of the colonial stereotype of the "vulnerable [and dependent] other" (p. 4272). In his analysis of the popular VR documentary, *Clouds Over Sidra* (Arora and Milk, 2015), Irom (2018) observes that the locus of power is still centred on the filmmakers who choose the 'representational filters' that form the themes and content, and who are granted corporate sponsorship. Irom writes, "VR's major assertion is that the technology has transcended any of the representational filters that burdened earlier communication technologies" (p. 4273). In a similar vein, Mandy Rose (2018b) draws on Jill Godmillow to note that validations of the effectiveness of the medium—e.g., a reported correlation between humanitarian VR content and increases in donations to non-profit organizations—could still promote "the status quo, by failing to address the systemic causes of the social problem described, or probing the ways in which the viewer is implicated in those systems" (p. 143). In other words, rather than attempt to facilitate an understanding of the ways that the viewer may unintentionally accept or participate in systems of oppression, the viewer is positioned as an ally of the marginalized 'other' through presumptions of embodiment. In the case of *Clouds over Sidra*, the filmmakers make the claim that the technology makes "you feel like you're actually there" (Within, 2016), within a brief eight and a half minutes of edited film. As Sherry Turkle (2016) points out, "No matter how fantastic the art, it's easier to make a movie than to talk to those refugees" (13:15). For the viewer, non-mediation is the promise of change,

simplifying and obfuscating power in part by presuming that understanding can happen through spectatorship from the comfort of one's own home.

Echoing the online 'identity tourism' that she described in the 1990s, Lisa Nakamura (2019a) contends that VR documentary productions show the 'digital undercommons,' in which people of colour are racialized and made to seem powerless, not represented as producers but as objects. Watching these films, the VR spectator is put into a stigmatized identity, feeling that 'it's not so bad' for these 'exotic others' (Nakamura, 2019a). Daniel Golding (2019) parallels this view, arguing that as representations of affective spectatorship are the "dominant 'image' of VR" (p. 2), the content demanding this kind of embodied experience—demanding transformation—is akin to content for early cinema catered to a white, male audience who were discursively improved by the 'strenuous spectatorship' involved in watching depictions of violence and the struggle of others. For Rose (2018b), the humanitarian justification of this spectatorship relies on an overvaluation of affect: "[A]ffect has in general been privileged over understanding; the experiential potential of VR [is] translated into work aimed at generating compassion rather than oriented towards equity, justice, or rights" (p. 144). Nakamura (2019a) takes it a step further: the tears of the spectator are provided as evidence not just of affecting content, but presented as proof that the headset produces empathy, and proof that this technology offers transformation. Through the blur of tears, VR is said to be unmediated truth.

Helen Kennedy and Sarah Atkinson (2018) describe this type of content as a "subgenre of contemporary virtual reality experience which appears obsessed with geographies that are dystopic, traumatic and problematic in which mental health sufferers, the visually impaired, refugees, prisoners, are either trapped within, or struggle to navigate and comprehend" (p. 2). Kennedy and Atkinson propose that these experiences can be understood through what they term

'transportation' and 'transference'; transportation refers to a virtual change of place, while transference refers to a virtual change of subjectivity, with a "distinct positionality designed into the experience" (p. 2). The authors write that although there is a history of stereoscopic and other experiences depicting 'picturesque, exotic and distant landscapes,' contemporary VR complicates these experiences by positioning the viewer as someone experiencing a 'first hand' account. While Kennedy and Atkinson do not deny the 'profound' potential of the medium, their analysis makes it clear that an affective VR experience might also require the viewer to ignore particular aspects of the experiences, whether it be the physical discomfort of wearing the headset, the difficult but required movement (e.g., 'spine twisting'), or even the visual evidence of the filmmakers, shoddily removed. In their description of one experience, Kennedy and Atkinson write, "the [camera] operator is visible with a disturbingly abject sawn-off hand" (p. 9). It is ironic that this should be another first-hand account.

There is a precedence for this construction of the 'immersed' spectator 'experiencing' the suffering of others in VR. In 2010, Nonny de la Peña and her collaborators, including VR researchers Mel Slater and Maria Sánchez-Vives, made the case for 'immersive journalism,' which is concerned with offering first-person VR experiences of the news in order to "reinstitute the audience's emotional involvement in current events" (p. 298). The authors' example case is a VR experience that would "allow a participant to undergo an illusionary transformation of his or her physical body perceptually entering the body of a detainee," (p. 295) inspired by accounts from Guantanamo Bay, including attention to 'stress positions' and 'harsh interrogation.' Again, not only is there an implicit assumption that the spectator will learn an embodied, affective truth from this experience, but also that the audience does not already have an embodied, affective understanding of these experiences. Writing for *The Verge* after trying two VR experiences by de

la Peña centred on violence towards women, technology journalist Adi Robertson asks, “Is it still empathy if you expect it to happen to you?” (Robertson, 2016a, para. 10). For Robertson, yes, it produced an emotional response, but more specifically the feelings of being threatened, as well as feelings of violence and a hate toward those who commit acts of violence. Robertson’s experience shows that when VR content depicts suffering, it is premised on the notion that the suffering is not the viewer’s own, and that an affective response—even when distressed—will ultimately be positive.

Reflecting on Nonny de la Peña’s ‘pioneering’ role in developing content for VR that depicts human suffering, Rose (2018b) emphasizes what Kate Nash (2018) calls the ‘moral risk’ of ‘improper distance’ to question the presumed closeness to those whose suffering is represented. Nash observes that while witnessing through media is already wrought with debate and nuance, VR complicates the moral relationship between the spectator and the represented other by seeking to simulate (rather than simply depict) an event. Drawing on Paul Frosh, Nash (2018) offers an example of critical positioning that could mitigate the negative effects of media witnessing:

> The attitude of witness requires both empathy and analysis, if empathy points to an affective response grounded in an imaginative engagement with the experience of the other, analysis calls for a more distanced relationship that recognises the distinctiveness of self and other. (p. 124)

For Nash, the crucial challenge with VR is that its ‘immersive’ qualities can efface its critical potential: in the same moment that the viewer is asked to witness the suffering of others, there is rarely any action that can be taken beyond looking away.

A common theme across the work described in this section is an effort to identify some of the historical precedents for contemporary VR and its content (e.g., Golding, 2019; Kennedy and Atkinson, 2018; Rose, 2018b). As Rose (2018b) describes, although documentary VR represents a more recent turn to digital, interactive content—an effort to better represent the 'real'—a historical, interdisciplinary perspective of available scholarship "can inform creative development, guide ethical practice and open up avenues for the next stages of enquiry" (p. 29). As one example of this kind of critical, historical perspective, Alfio Leotta and Miriam Ross (2018) propose that the mediated experience of distant places and the depiction of the plight of others has its roots in cinema and earlier stereoscopic images. For Leotta and Ross, such experiences "promise to fulfil utopian aspirations to conceive and grasp the world as a picture with an emphasis on exotic views and pleasurable spectacle" (p. 150). In these contexts, the viewer is positioned as the privileged tourist whose gaze is a raced and gendered enactment of colonial 'visual dominance.' Like Irom's (2018) reading of humanitarian VR, Leotta and Ross (2018) argue that touristic content involves objectifying distant locations for the consumption of the Western spectator. The "ultimate colonialist fantasy of global control" (p. 154) is made possible with a 360-degree camera and a headset. In this sense, the historical precedents of VR act as a warning: the colonialist promise of transformative, visionary technologies have come before and with VR they are repeated.

The Effect of Affect: Towards an Ethics of VR

For documentary media, despite important technological differences that change how content is produced and consumed, it is the discursive promise of VR as a platform that presents an initial ethical concern. Examining the ethics of 'immersive' journalism, Hollis Kool (2016) emphasizes the 'major regulatory power' of the 'orchestrating journalist,' using the example of a

VR director 'herding' children for an affective and supposedly non-mediated (but also slow-motion) scene of children laughing as they run to and encircle the camera (i.e., the viewer). Kool points out that creating this sense of non-mediation that is so often the goal within VR work is not only intentional but also laborious, requiring a level of expertise: "To produce a VR experience, journalists consider: camera height, camera movement, directional sound, framing of the subject, background music, narrators, captions and text, fade in transitions, jump cut transitions, and more" (p. 6). Moreover, as Kennedy and Atkinson (2018) and others describe, the camera is often omitted, which intentionally omits the presence of the creators. In these examples, it is not simply the technological differences of VR documentaries that create new responsibilities for content creators, but also the ethical concerns embedded within any attempt to adhere to and fulfill the promise of non-mediation.

These concerns are compounded when the content in question is expected to be a representation of the truth. As Ana Sánchez Laws and Tormod Utne (2019) point out, even though accepted practices at major news outlets like *The New York Times*, *The Guardian*, and *Reuters* are relatively consistent, prohibiting methods such as staging, adding/removing elements of a scene, or altering photos, these ethical guidelines have not been adequately enforced for VR. There are staged scenes in *The Displaced* (The New York Times, 2015), and work that uses CGI and volumetric capturing to recreate scenes—like de la Peña's—presents additional challenges:

> These are true synthetic worlds that claim authenticity. Such authenticity and accuracy is not claimed on the basis of realistic imagery or lack of manipulation (how could that be when everything is constructed!), and in this sense completely break with the classical concerns of visual journalism. (Sánchez Laws and Utne, 2019, p. 10)

In this case, notions of 'authenticity' in VR are bolstered by the veneer of journalism, no matter how 'constructed' the scene. Sánchez Laws and Utne conclude that further precautions are necessary for VR, whether because of increased risk of psychological harm when embodying a subject position within distressing scenes, or potential risks for younger audiences, since the effect of VR on children is still unknown.

Due in part to their specific context of use, the guidelines for journalists do not address the range of ethical considerations that Rose (2018b) outlines, which she bases in part on Michael Madary and Thomas Metzinger's (2016) recommendations. Madary and Metzinger describe a number of possible adverse effects and uses of VR, examining the problem of 'dual use,' whereby a technology is used for applications beyond its original intention. The authors argue that the military applications of VR are a pressing concern in this regard: "In the context of VR technology, one will immediately think not only of drone warfare, teleoperated weapon systems, or 'virtual suicide attacks,' but also of interrogation procedures and torture" (Madary and Metzinger, 2016, p. 10). While the authors do not define 'virtual suicide attacks,' the potential risks are in part based on how screen- and camera-based technologies are already used (e.g., for surveillance, or to pilot drones or robots), as well as how these applications might come into contact with the psycho-social experiments already being conducted in VR, such as Stanley Milgram's obedience experiments (Slater et al., 2006). To counter empathy rhetoric based on prosocial conditioning in VR (see e.g., Bailenson, 2018), Madary and Metzinger (2016) ask how VR might be used to decrease the empathy of soldiers; or, if there is a potential for strong emotional responses, how might these technologies be used to cause suffering? Torture—causing intentional suffering—is torture whether in VR or not, and the same is true of other possible

negative uses of VR, including 'virtual rape' and other forms of trauma and harm. Again, a key factor underpinning these speculations is that the lasting effects of VR are unknown.

In response to Madary's and Metzinger's (2016) guidelines, James Spiegel (2018) argues that more specificity is needed, recommending "an industry-wide rating system, legal age requirements for some VR products, informational and warning labels, public disclosure mandates, and no-share laws" (p. 12). (In brief, no-share laws specify how and when companies can use and share personal data.) Spiegel first groups the potential dangers into four categories, including mental health risks, neglect of physical bodies and environments, an increase in data collection on the part of companies and governments, and other social and moral risks due to the blurring of the real, including sexual assault. Like Madary and Metzinger, Spiegel bases these risks on existing cases in other media (such as games), noting that the current lack of empirical data about harmful uses of VR does not foreclose the possibility of implementing specific strategies to mitigate possible risks. A compelling example is the 'wager' that Spiegel identifies with regard to proposed age restrictions for VR. Spiegel posits that if future evidence proves that VR is harmful to children, the restrictions will have prevented harm to many; if, however, future evidence proves that VR is not harmful to children, those children will have been temporarily deprived of the use of a medium whose benefits are not unique to the medium.

With so many unknowns about VR as a platform, what begins as questions about specific practices for documentaries can quite easily lead to questions about other possible unethical uses of the platform. An approach like Spiegel's (2018) offers a pragmatic middle ground between the specificity of journalism on one hand and the dangers of virtual futures on the other. Yet there is little here to tell us how and why corporations have so quickly entered this domain, how VR might reinforce normative constructions of gender, race, ability, and other axes of identity, or

how industry leaders have helped to shape the discourse of contemporary VR. Drawing on feminist games scholarship, scholarship on nonfiction VR could be expanded by looking more specifically across communities of content creators and audiences, across modes of production, as well as by offering an increase in feminist analyses of representation and content. The ethical recommendations for the use of VR outlined in this section also suggest the need to critically examine partnerships between institutional content producers (e.g., news organizations) and technology companies (Atkinson and Kennedy, 2018; Rose, 2018b), in order to examine how these companies participate in this particular proliferation of the platform, and what they stand to gain.

Conclusion

Although documentary media and video games are traditionally separate research domains, not only are there advantages in looking beyond disciplinary boundaries, but for VR it may be necessary. One advantage to looking across disciplines is alternative commentary on similar issues. For example, videogames have also been said to generate empathy. In *How Games Move Us: Emotion by Design,* Katherine Isbister (2016) aims to show how game designers attempt to create empathy and positive emotional experiences. Like the prosocial claims that are the basis for much of the nonfiction VR content that depicts the suffering of others, Isbister's work is grounded in psychological and neuroscientific justifications; like the VR work employing empathy rhetoric, there is a hierarchy at play, in which the content creator uses 'tools' to 'trick' the brains of players; and like the audience of immersive journalism, this is not a particularly empowered audience but rather an audience at the mercy of a content creator's best intentions. Despite the inherent essentialism to claims about what the brain wants and needs, despite the ethical responsibility entailed in responding to those presumed needs, the assumption

is that the content creator knows best. Similarities such as these are yet another reminder that the claims that undergird contemporary VR are not unique to VR. Neither are the critiques.

Within games studies, Ruberg (2019) critiques empathy rhetoric in the context of queer games as an 'appropriation' of queer experiences by the hegemonic majority. For Ruberg, "Queer indie games have commonly been described as empathy games, that is, games that allow nonqueer players to 'step into the shoes' of queer and trans subjects" (p. 4). Mattie Brice (2017), whose games have been categorized as empathy games, contends, "There are more 'empathy games' made by white people about everyone else than a focus on how marginalized creators wish to express their own experiences" (para. 11). To avoid the risk of 'experience tourism' Brice turned her game, *Mainichi* (2012), into performance art that ultimately became a conversation: "I realized during this performance that I couldn't expect to enact change by putting up this one-way art, but by enabling a conversation in an uncomfortable situation" (Brice, 2017, para. 16). This call for conversation is akin to Nash's (2018) argument for a critical positioning in 'media witnesses' in VR: the medium alone cannot affect change. As Rose (2018a) cautions, the removal of that type of dialogue in VR documentaries is dangerous:

> It is contradictory that a media technology being heralded for its prosocial potential should efface the social engagement between producer and subject that has historically been at the heart of documentary filming – following a logic of surveillance rather than one of dialogue. (p. 6)

Whether the content is in the form of games, performance art, or documentaries, other media and artistic practices offer insight into the same kinds of experiences that VR is said to provide.

Within scholarship on nonfiction VR, there is already motion towards interdisciplinary considerations. Sánchez Laws and Utne (2019) point out that making VR journalism requires

interdisciplinarity, which may offer a means to "[ensure] better cross-checking, where preconceived attitudes and blind zones can be challenged. The programmer may question a journalist's analysis of data sets, the designer may question a journalist's idea of the presentation, and vice versa" (p. 10). Though this assumes particular relationships within a small team, the interdisciplinarity that is necessary for content creation is another indicator there may be a need for VR scholarship that takes a broader view. Sánchez Laws and Utne also note that the members of these teams will not have the same training, since the person creating a scene in VR may have "experience from using VR in gaming and/or entertainment industries" (p. 10). If the applications are cross-sectoral, it follows that scholarship can benefit from such an approach.

In their development of a methodology to analyze VR experiences, Kennedy and Atkinson (2018) also apply an interdisciplinary approach, drawing on "cultural anthropology, film studies, games studies, transmedia studies and technology studies" (p. 4). This range of interlocking considerations for an analysis of VR work demonstrates a need for a contextualization of VR that considers the variety of texts, discourses, relationships, and subjective experiences that make the presentation of VR content possible. In other work, Atkinson and Kennedy (2018) argue that VR is often used in conjunction with other technologies, part of an Extended Reality (XR) 'production ecosystem' that involves multiple stakeholders, a point I return to in the next chapter. For Atkinson and Kennedy (2018), the ecosystem is defined, in part, by its interdisciplinarity; VR is not an industry, but rather a tool used by many industries:

> Virtual Reality, and Extended Reality production is a truly inter-disciplinary domain—creative projects involve the work of theatre, film, and game practitioners alongside journalists, psychologists, physicians, computer scientists, technologists and

> programmers. VR and XR projects are emerging from a number of interrelating industries—there is not a 'virtual reality' industry as such—they are born from a project-based mode of working, and as such, we have chosen to conceptualise them as unique forms of creative 'ecosystems.' (pp. 1-2)

While there are differences to organizational structures, institutions, audiences and other major factors that separate fields of study, there remains a common denominator: VR, a tool that brings together various disciplines and 'interrelating industries.'

Across these domains, the use of VR suggests at least two key commonalities: the headsets and the companies that manufacture them. For these companies, games and nonfiction content are only two among many possible uses of VR displays. Feminist and queer approaches to games studies appears poised to tackle the repeated claims of separate worlds in the same way that it has for games: "Fantasy," write Ruberg and Shaw (2017), "is always already political" (p. xxi). If gamers are to be among the first audiences for contemporary VR, the current culture of games can help to extend an analysis of the contemporary fantasy of VR. Within nonfiction VR scholarship, a common theme is that even if it is affecting, its social, political, and psychological effects are still largely unknown, requiring more research on the ethics and the broader reach of contemporary VR. In the next chapter, I develop a theoretical and methodological framework that draws on technofeminism, arguing that these perspectives can help to examine how VR is 'enmeshed' within complex sociotechnical arrangements, as Rose (2018b) describes in her review of nonfiction VR. This foundation will provide a critical lens for an examination of a facet of contemporary VR that is currently overlooked in recent scholarship: the role of industry leaders in shaping the discourse around VR, and the politics of their claims.

Chapter 2 - Theoretical Framework and Methodology

"But that's where the bad news comes in. Our global civilization came at a huge cost."

—Ernest Cline, *Ready Player One*

Introduction

Debates across games studies and documentary studies show the need for an overarching perspective of VR that crosses disciplines, audiences, content, and institutions. In this chapter, I respond to this call by drawing on feminist science and technology studies (feminist STS, or technofeminism) to develop an account of VR that is situated within entangled sociotechnical arrangements. An intersectional perspective hones these considerations by asking more directly who stands to gain from a technological 'innovation' like VR and who does not. These theoretical considerations inform my methodological choices, in which I describe my use of frame analysis and a case study to examine the contexts of industry leaders' discourse on VR. As this discourse is defined and constrained by its relationships to broader systems of power and control, a networked understanding of VR contributes to a better understanding of how that power is structured and maintained. What is at stake in this analysis is the ability to identify possibilities for interventions that recognize, contest, and potentially reconfigure the marginalizing impact of contemporary VR.

As I lay the groundwork for an examination of the networked politics of VR, I employ Langdon Winner's (1980) interpretation of technology and of politics:

> By "politics," I mean arrangements of power and authority in human associations as well as the activities that take place within those arrangements. For my purposes, "technology" here is understood to mean all of modern practical artifice, but to avoid

> confusion I prefer to speak of technology, smaller or larger pieces or systems of hardware of a specific kind. (p. 123)

Among Winner's examples of the 'politics of artifacts' is his description of Robert Moses's design of low-hanging overpasses on parkways that denied access to buses while allowing free access to cars. According to Winner, Moses wanted to prevent those who used public transit (poor people and African Americans in this case) from accessing a park that he had also designed, enforcing a racial and class-based prejudice by engineering seemingly innocuous infrastructure. Winner points out that these forms of power and politics are not necessarily intentional conspiracies (though they can be, as this example shows), but they are indicative of the 'countless ways' in which artifacts enforce particular ideologies.

While Winner (1980) points to his own work to note the difficulty in defining technology (referring to Winner, 1977), a history of feminist work has examined how rigid characterizations of technology often exclude, reinforcing technology development as a rarefied space, as the domain of men, and requiring 'masculine' skills and attitudes (see e.g., Cockburn and Ormrod, 1993). In bridging these considerations, I do not intend to definitively identify what technology is, but rather to propose that the collection of technologies embedded in the term, VR, represent (or 'embody,' in Winner's [1980] terms) systems of power that affect or enforce particular social arrangements. As Winner (1980) puts it, "The things we call 'technologies' are ways of building order in our world" (p. 127). Analyzing how these systems of 'order' are understood and/or defined by industry leaders and corporations, a technofeminist interpretation stresses that the material and discursive practices that define technologies often reinforce discrimination and oppression, whether intentionally or not, requiring alternative orientations to technology.

In order to help define the contours of my theoretical framework, I will also use the example of Facebook in this chapter to illustrate some of the broader sociotechnical ramifications of contemporary VR. As one node among many, as the purchaser of Oculus, Facebook stands as an example of networked power that is simultaneously materially and discursively maintained. It is emblematic of Facebook's wide reach that even when describing Facebook as a networked purveyor of problematic relations, there are other controversies that I will neglect to discuss (e.g., Cadwalladr and Graham-Harrison, 2018; Solon, 2018; Wong, 2018). Because of these controversies, Facebook was reported to be "one of the industry's favourite punching bags" (Hern, 2018, para. 5). While it is likely a competitive strategy for other companies to target Facebook with derision, it is something of a misdirection. Facebook's faults do not absolve the industry of its own faults, nor does it alter the industry's global aspirations or overall ideological impetus. A technofeminist lens helps to show that these issues are more complex and more widespread than a single company. When VR is situated within these networks, VR becomes linked to the interests of multinational corporations, establishing particular possibilities of use and control, as well as possibilities for change.

Staying with the Trouble of VR: Towards a Technofeminist Analysis of VR

In an article for *The American Prospect*, Fred Turner (2015) provides an account of the politics of VR that begins by describing how the promise of VR relates to the power of propaganda media, how politically-infused and mediated discourse shapes thought, and how media shapes sociopolitical relationships: "[O]ur interactions with media as audiences influence our interactions with each other as citizens" (para. 20). Turner's account is not initially about sociotechnical arrangements, but rather about the communicative potential of the medium and how that influences the ability to act as a democratic citizenry. Towards the end of the article,

Turner (2015) offers a glimpse of a broader kind of politics: not only that the medium can be used for both good and bad, but that the medium will thrive on revenue from new sources of data:

> [T]hey have to track your movements minutely in order to provide the illusion of immersion. The data they generate will be as personal as the way we sit and walk, as intimate and local as our living rooms. States and corporations will certainly pay dearly for that information. (para. 32)

With the ability to interpret and/or mediate 'personal' and 'intimate' data, the politics of VR becomes linked to questions about how personal data is collected and used, and how that data may be valuable to powerful entities, both in their aggregate and for the tracking of individuals. Turner concludes his article by writing, "If immersive media are to truly serve democratic ends, we will need to confront not only the new psychological power of virtual environments, but the persistent political and economic powers of the world outside the headset" (para. 33). As I suggest in the previous chapter, the concerns that scholars raise about these types of interlocking relationships in contemporary VR are not yet fully fleshed out. Nevertheless, Turner's work offers a warning amid the hype of 2015, outlining concerns about how power and control is distributed across a network of possible relationships.

In an effort to extend this examination of the politics of VR, I rely on technofeminist conceptualizations of networks that constitute technologically-mediated relationships, which can be traced to feminist applications of Actor-Network Theory (ANT) (Suchman, 2009). Since at least the late 1970s, sociologists and other researchers in science and technology studies have actively developed ANT as an approach to describe the world as effects within a relational web of human and non-human contingencies (Callon, 1999; Latour, 1999, 2005; Law, 2009). To

acknowledge these webs of contingencies is to acknowledge the connections between the human and the nonhuman—two categories that are not distinct but instead considered to be co-constitutive. Although more recent interpretations of ANT continue to clarify and debate its theoretical nuances and applications, technofeminism has offered a critical contribution to ANT by calling attention to the politics of sociotechnical arrangements, particularly with regard to gender (Suchman, 2009; Wajcman, 2004). As Cockburn (1997) describes, academic analyses of technology can unintentionally reproduce gendered systems of power by focusing on what is problematically interpreted as exciting, 'masculine' applications of technology. In other words, analyses that include the most influential or the most visible groups and individuals (i.e., dominantly men) must not disregard the less visible groups and individuals (i.e., dominantly women) who make those more influential groupings possible (Cockburn, 1997; Wajcman, 2000).

The gendered relations within these systems begins to reveal how technologies co-constitute the social: it is a network that is maintained by unequal relationships. For example, Wajcman (2004) writes that when men "dominate scientific and technological fields and institutions" (p. 12), they also define the language and skills necessary for what is understood as technological competence, resulting in a "differential impact on men and women" (p. 42). A goal of technofeminism, then, is to examine the heterogenous effects of a given network, not only identifying who is represented in the workforce, but also how particular skills are valued, and how discriminatory norms are enacted across broader organizational systems (Kaygan, 2016). According to Lucy Suchman (2009), a feminist perspective within science and technology studies offers three 'crucial sensibilities,' offering tools to examine the marginalizing norms of the tech sector:

> First, feminist research displaces traditional preoccupations with abstracted and decontextualized forms of knowledge in favor of particular, specifically situated practices of knowing in action. Second, feminism directs attention always to the labors (particularly those previously ignored) that are an essential and ongoing aspect of sociotechnical assemblages and the capacities for action that they enable. And finally, feminist research orients us not only to relations and symmetries among persons and things, but also to the politics of difference. The boundaries that constitute things as separate and different are treated not as pre-given, but as enacted, and practices of boundary-making and the enactment of difference are inevitably political. (p. 6)

Suchman proposes that these three sensibilities—to situated knowledges, to labour, to the politics of difference—offer a way to examine the contingent relationships that are embedded within technological networks. Suchman draws on Karen Barad's (1998, 2003) 'agential realism' framework to conceptualize politics as an 'always already' feature of sociotechnical arrangements, and to conceptualize the 'material' and 'discursive' as interrelated and co-constitutive, defining how matter and meaning are produced and constrained.

In this context, a VR headset could be substituted for Barad's (1998) example of the scientific apparatus: what is seen through the apparatus is a product of—and a part of—ongoing configurations. The apparatus does not help the scientist to see a more 'real' representation of the world, but rather defines particular limitations about what it is possible to see: "Phenomena are the effects of power-knowledge systems, of boundary-drawing projects that make some identities/attributes intelligible, to the exclusion of others" (Barad, 1998, 106). The apparatus defines boundaries; in doing so, it includes and it excludes. For consumer VR, characterized as new again after its first halted beginnings, there are opportunities to examine what relationships

and power dynamics it supports, not only in its phases of design, production, and adoption, but also across the broader networks that make these sociotechnical arrangements possible.

The 'feminist sensibilities' that Suchman (2009) identifies are also a reminder that what underpins these analyses of technological networks is a call for alternatives. In Barad's (2003) words, "Particular possibilities for acting exist at every moment, and these changing possibilities entail a responsibility to intervene in the world's becoming, to contest and rework what matters and what is excluded from mattering" (p. 827). In recent work, Donna Haraway (2016) suggests that Barad's framework becomes 'common sense' when striving to develop 'sympoetic' relationships, i.e., intentional, generative, and accountable relationships *with* the dynamic systems and processes that make up the world. Developing the ability to respond to injustice while living within these systems involves what Haraway (2016) calls 'staying with the trouble,' a call to recognize ethical opportunities for action. Just as technofeminism is an attempt to navigate between problematic visions of the future and to identify the politics of networks, 'staying with the trouble' is an attempt to stay within and to problematize the present moment.

Intersecting Communities: Networks of Inequity

In order to begin to examine the politics of VR, I use the example of Facebook in this section to illustrate the simultaneity of some of the relations within its sociotechnical network. This simultaneity is emblematic of what John Law (2009) refers to as the 'disappearing dualisms' of network analysis: the presumed dualism of a given pair of concepts (e.g., micro and macro) 'disappears' when the two are theorized as relational and co-constitutive rather than fundamentally hierarchical or ontologically separate. Each facet, large or small, visible or invisible, is entwined within a given network. In Barad's (1998) terms, the relationships of a VR network are dynamic and 'intra-active': they are co-constitutive and can change in a moment.

Despite these possibilities for change, particular sociotechnical arrangements are 'stabilized' (Law, 2009), making some relationships possible while foreclosing others. According to Wajcman (2004), "Stabilization and standardization of technological systems necessarily involve negating the experience of those who are not standard. Networks create not merely insiders, but also outsiders, the partially enrolled, and those who refuse to be enrolled" (pp. 42-43). For VR, the moment that Facebook acquired Oculus is a moment of change as well as a moment of stabilization. VR became yet another tool for Mark Zuckerberg to realize his stated "mission to make the world more open and connected" (Zuckerberg, 2014, para. 2). As VR became intertwined in the web of relations that constitute Facebook, it also became connected to the political contexts that make Facebook's 'communities' possible.

In 2017, Zuckerberg wrote a post on Facebook that he titled, 'Building Global Community' (Zuckerberg, 2017a). The news media called it a manifesto with political ambitions, a kind of 'state of the union' with all its requisite scope and vagueness (Solon, 2017a). It was something of an indirect response to the reports that Facebook was complicit in the 'fake news' leading up to Donald Trump's U.S. election victory in 2016. As a position statement, it contains such declarations as, "Our greatest opportunities are now global—like spreading prosperity and freedom, promoting peace and understanding, lifting people out of poverty, and accelerating science" (Zuckerberg, 2017a, para. 3). At nearly 6,000 words, the post is addressed 'to our community' and uses the word 'community' over 100 times, bringing to my mind the utopic visions of 'virtual communities' of the 1990s, only without the 'pitfalls' identified at that time:

> Instead of falling under the spell of a sales pitch, or rejecting new technologies as instruments of illusion, we need to look closely at new technologies and ask how they can

> help build stronger, more humane communities—and ask how they might be obstacles to that goal. (Rheingold, 2000/1993, pp. 320-321)

Though he acknowledges unidentified 'mistakes,' Zuckerberg (2017a) never examines how the tool—Facebook—might be an obstacle to the goals that he outlines. Instead, Facebook is positioned as integral to humanity's 'progress': "Progress now requires humanity coming together not just as cities or nations, but also as a global community" (para. 3). For Zuckerberg, it is taken for granted that that Facebook can, should, and will provide the platform for this 'global community.' It is taken for granted that the global community can, should, and will be built and maintained by a technological infrastructure. It is necessary that 'humanity' does this.

Writing in the same year that Facebook was launched, Wajcman (2004) highlights what is excluded in utopic visions of 'virtual communities': "The virtual community is a social vision that glosses over the fact that communities are also about material resources and power" (p. 62). Facebook's aspirations to create global, open, and inclusive communities are premature when evidence of inequalities and digital divides negate the very foundations of these communities or the values they purport to uphold. Even as Facebook becomes global in scale and scope, the 'fake news,' the 'bubbles' of (mis)information, as well as Zuckerberg's corrective strategies, suggest that Facebook's 'communities' are already segregated and segregating. The imagined salvation of the Facebook community obfuscates a repetition of the same problematic relations that existed before the virtual, and that continue to exist today. In this sense, the virtual is always already material, shaping and shaped by the 'real.'

One pressing example is the unrecognized labour that these sociotechnical arrangements require. As Suchman (2009) contends, it is necessary to recognize "the mundane forms of inventive yet taken for granted labor, hidden in the background, that are necessary to the success

of complex sociotechnical arrangements" (p. 4). Even as Zuckerberg (2017a) explains that today's social networks 'require' artificial intelligence, much of the work that Zuckerberg hopes to automate is still done by humans. When Zuckerberg writes, "We review over one hundred million pieces of content every month" (para. 72), of course he is not part of the group that reviews that content. Instead, that work is outsourced to other companies, both in the United States and abroad. Writing about the day-to-day lives of Facebook moderators, Casey Newton (2019a) at *The Verge* argues that discourse about AI and automation purposely obfuscates the actual labour of content moderation. While Zuckerberg (2017a) repeatedly refers to the need to build 'social infrastructure,' which he claims Facebook provides, a technofeminist response is to examine who is tasked with building this infrastructure, and how Facebook already benefits from unequal labour relations.

Whether moderating content or building computer parts, technological development relies on the underpaid labour of women (Nakamura, 2015; Wajcman, 2004). Problematizing notions of liberatory virtual communities, Wajcman (2004) writes, "The central role of women in participating in and preserving communities is overlooked. Women have historically been the pre-eminent suppliers of emotional support in community networks and the major suppliers of domestic and unpaid community work" (p. 62). The practice of overlooking the contributions of women, especially women of colour, has long been the norm in technological development. Nakamura (2008) asserts that online labour is just as racialized as offline labour, and the internet is no 'postracial' haven:

> Racialization has become a digital process, just as visual imaging practices, labor, and social discourse have. The process of racialization continues on both the Internet and its

> outernet, as the 'dirty work' of virtual labor continues to get distributed along racial lines. (p.1681)

Recent revelations by Facebook's contracted employees are beginning to show what this kind of 'dirty work' involves today. Breaking their non-disclosure agreement to speak to Casey Newton at *The Verge,* three former Facebook moderators in the US describe gruelling working conditions within unsanitary, unsafe environments, with employees claiming that "managers laugh off or ignore sexual harassment and threats of violence" (Newton, 2019b, para. 10). The revelations at the US site prompted further revelations in Germany. Exposed on a daily basis to graphic content, including violence, child pornography, and hate speech, the emotional toll of the work is said to produce symptoms of post-traumatic stress disorder, with some employees reportedly becoming "'addicted' to graphic content'" (Hern, 2019, para. 2) or coming to believe the far-right misinformation that they filter.

While moderation is necessary to the success of the tech sector—and therefore part of the tech sector—it is work that is deemed separate and of lower status. In a report for *The Verge*, Catherine Buni and Soraya Chemaly (2016) write, "Typically cast off as 'customer-service,' moderation and related work remains a relatively low-wage, low-status sector, often managed and staffed by women, which stands apart from the higher-status, higher-paid, more powerful sectors of engineering and finance, which are overwhelmingly male" (para. 69). As Wajcman (2004) observes, "Women are the hidden cheap labour force that produces routine science and technology" (p. 45). The value judgements that are implicit in the gendering of particular skills is reminiscent of one of Cockburn's (1997) examples, in which she describes how a team of female home economists tasked with advising male engineers felt undervalued: "women and women's skills, which are characteristically domestic skills, are accorded less value than men and men's

skills, especially engineering. In this case the difference in worth could be measured in money" (p. 363). The measure of a moderator's monetary value (and social capital) is especially clear when compared to salaries of the white men who overrepresent Facebook's tech jobs (see Richter, 2018). Moderators contracted by Facebook are said to earn $28,800 a year, while the average Facebook employee is compensated over eight times more, at $240,000 (Newton, 2019a). As such, the work is gendered, dangerous, and undervalued. It is also crucial to Facebook's global aspirations.

Referring to a blog post by Ellen Silver (2018), VP of Operations at Facebook, in which she writes that contract work allows Facebook to 'scale globally,' Newton (2019a) observes that this is only possible because of the low status of these employees. In the post, Silver (2018) claims that Facebook employs 30,000 content reviewers around the world, in every time zone, in 50 languages. More than a decade ago, Wajcman (2004) wrote of the gendered labour that underpins this kind of technological expansion: "Much low-skilled, assembly-line work has moved offshore to the Third World, and is performed predominantly by women rather than men" (p. 121). This continues to be the case today. According to a recent Oxfam (2018) report, "82% of all of the growth in global wealth in the last year went to the top 1%, whereas the bottom 50% saw no increase at all" (p. 8). In that bottom 50%, the most hazardous and lowest paid work goes to women, and it is work performed in addition to women's "$10 trillion in unpaid care annually to support the global economy" (p. 10). As Raewyn Connell (2016) describes, the structures of transnational and heterogeneous patriarchies rely on an ongoing inequality maintained by technology and its globally distributed gendered labour relations. Facebook's ability to scale its contract work to 'every time zone' (Silver, 2018) relies on global power dynamics that benefit from the gendered, racialized, and financial factors of that labour.

An analysis of the ways that these networks hide or obscure the lived realities of particular power relations can also benefit from an intersectional feminist perspective. Building on a history of black feminist theory, Kimberlé Crenshaw's (1989, 1991) foundational conceptualization of the term offered a way to identify networks of oppression that obscured the ways that, for example, gender and race intersect to form new oppressions that legal recourse on the grounds of race or gender alone could not address. As Patricia Hill Collins (2015) describes, despite differences in application, intersectionality provides a lens to examine differences in power relations by theorizing social locations as relational and contextually dependent: "The term intersectionality references the critical insight that race, class, gender, sexuality, ethnicity, nation, ability, and age operate not as unitary, mutually exclusive entities, but as reciprocally constructing phenomena that in turn shape complex social inequalities" (p. 2). Applied to the contexts of Facebook that I have covered here, an intersectional analysis becomes an analysis of power and representation: it concerns not only whose labour is visible or invisible within Facebook, but how Facebook benefits from global systems of unequal relationships.

The conceptual similarities between intersectionality and technofeminism (e.g., the relational contingencies of power) is a reminder that technofeminist work is part of a feminist tradition learning from the contributions of women of colour. In her much-cited Cyborg Manifesto, Donna Haraway (2006) draws on bell hooks and other black feminist scholars to discuss the coalitional politics of 'women of colour' as a strategic grouping, using it as an example of a 'fully political' postmodern identity: "This identity marks out a self-consciously constructed space that cannot affirm the capacity to act on the basis of natural identification, but only on the basis of conscious coalition, of affinity, of political kinship" (p. 123). Reflecting on

her own writing from the 1980s, Donna Haraway (1991) writes of how she grappled with a theory that recognizes 'difference' and that is able to account for multiple social locations:

> It has seemed very rare for feminist theory to hold race, sex/gender, and class analytically together - all the best intentions, hues of authors, and remarks in prefaces notwithstanding. In addition, there is as much reason for feminists to argue for a race/gender system as for a sex/gender system, and the two are not the same kind of analytical move. And, again, what happened to class? The evidence is building of a need for a theory of 'difference' whose geometries, paradigms, and logics break out of binaries, dialectics, and nature/culture models of any kind. Otherwise, threes will always reduce to twos, which quickly become lonely ones in the vanguard. And no one learns to count to four. These things matter politically. (p. 129)

Similarly, Wajcman (2004) notes that technofeminism must be able to respond to 'emerging' theory: "The emergence of black and post-colonial feminism, for example, has posed a critical challenge to the privileging of the preoccupations and knowledges of white, Western women" (p. 127). Wajcman goes on to propose that technofeminism is able to do this because it can draw connections between the "micro-politics of local activism to the macro-politics of global movements" (p. 127). For VR, there is a need to continue to examine the connections between micro- and macro-politics to better understand the interconnected relationships across the production and dissemination of content. As the example of Facebook shows, these challenges are simultaneously gendered and racialized, simultaneously individual and global: a web of relations that extends far beyond VR alone. The wider its reach, the more institutionalized it becomes. The more centralized its power, the greater the inability to question its implementation.

Data and Methodology

There is a precedence for methodologies that consider the networked contours of VR, detailing the simultaneity of its various relations, whether micro or macro, human or nonhuman. For example, the methodology that Kennedy and Atkinson (2018) propose is an attempt to examine a variety of interconnected aspects that define a VR experience, including the technology, the content and its representations, as well as the embodiment, interactions, and affective response of the viewer. Their methodology draws on earlier work developed to analyze digital games (Giddings and Kennedy, 2008), which uses video recordings and verbal accounts to analyze the 'cybernetic' (Giddings, 2007) connections between the player and the game. In one example of the micro and macro co-existing in a single moment, Giddings and Kennedy (2008) refer to their knowledge of the 'Star Wars entertainment supersystem' and how that knowledge does and/or does not affect the immediacy of play within a Lego Star Wars game. It is not a critique of this work to note that this 'supersystem' could be further analyzed in this context, including, for example, the implications of a franchising partnership between two major brands (Lego and Star Wars); the remediation of Star Wars and its themes as something interactive and more explicitly for children; or the capitalist-consumer relations embedded within structures that monopolize Western storytelling. In that moment of play, these macro considerations—whether observed or not—are entangled in the network that also includes the micro, including the affective and embodied qualities of the content.

As these methodological considerations suggest, an analysis of VR must also include an account of the relations that extend beyond the immediacy of the experience. Like any network, the web of VR consists of ever-changing conditions and relationships, and a goal of this dissertation is to disentangle some of the factors that make particular relationships possible. My

work decenters the content of contemporary VR in order to respond to the call to analyze the 'enmeshedness' (Rose, 2018b) of a complex VR 'ecosystem' (Atkinson and Kennedy, 2018), composed of interdisciplinary considerations and consisting of multiple stakeholders. While Atkinson and Kennedy (2018) acknowledge the critique that ecosystem rhetoric makes creative-industrial partnerships appear natural—though it is corporate, and based in the technological—their point is that these relationships are understood as mutually beneficial, validated through awards and other recognition. In the cases that Atkinson and Kennedy describe, technology companies gain the creative acumen and validation of artists and arts organizations, while arts organizations and artists are seen to offer something novel by doing technologically sophisticated renditions of new and older work. That new partnerships or relationships are made possible by VR suggests that the study of contemporary VR is also the study of how and why particular sociotechnical arrangements are formed and/or maintained.

As the power to define the discourse and the technological parameters of VR is placed in the hands of corporations, I investigate the discursive claims of industry leaders who tout the revolutionary, democratizing, and emancipatory potential of virtual reality in order to examine how and why such democratic and inclusive discourses are mobilized, and how they account for the racialized and gendered practices and ideologies that drive notions of VR 'progress.' For example, if contemporary VR is made real by 'pioneers' (e.g., Google Developers, 2017) looking out upon 'new frontiers' (e.g., Abrash, 2017), what will their promises of transformation entail? I focus primarily on Facebook and Google, rather than their VR competitors HTC and Sony, in part because of their reach. As of 2019, Facebook boasts over 1.62 billion daily active users (Clement, 2019c), while as a search engine Google has a global market share of almost 88% (Clement, 2019a), and Google's Android operating system represents nearly 86% of the global

market share of smartphones (Clement, 2019b). Within these global contexts, Google and Facebook generate most of their revenue from advertising, which consists of a wide array of data-gathering initiatives that an audience in VR stands to supplement. For Facebook and Google, a stated interest in bringing VR to as many people as possible (Chaykowski 2016; Pierce 2015), suggests an ambition to gather data from as many people as possible. It is also, as I discuss in Chapter 5, an opportunity for these companies to normalize new forms of data collection—from bodies and from environments—expanding the ways that public and private data is used, tracked, and monetized.

As representatives of corporations, industry leaders play an important role in shaping how VR is designed and understood. Statements and declarations that are debuted at developer conferences are filtered and/or repeated in news articles and other media. In his work on early VR enthusiasts, Maxwell Foxman (2018) observes that accumulating, interpreting, and ultimately relaying the variety of information disseminated about VR was part of the process of adoption. Foxman writes, "Endemic issues concerning VR, along with discussions about its practical and cultural limitations, circulate from this media environment to my informants and back through their own output" (p. 64). Robert Entman (2003) might call this 'cascading activation,' whereby discursive frames are hierarchically disseminated and adopted. Entman (1993) suggests that "communicators" (industry leaders and developers in my study), "make conscious or unconscious framing judgments in deciding what to say, guided by frames (often called schemata) that organize their belief systems" (p. 52). For Entman (1993):

> Framing essentially involves *selection* and *salience.* To frame is to *select some aspects of a perceived reality and make them more salient in a communicating text, in such a way*

> *as to promote a particular problem definition, causal interpretation, moral evaluation, and/or treatment recommendation* for the item described. (p. 52, original italics)

This conceptualization emphasizes how purposeful framing can be. As I discussed in the introduction, one of my initial motivations was to examine how corporations communicated the risks of cybersickness; but it was not a topic that was made salient. Identifying such exclusions is a key factor of frame analysis: "Most frames are defined by what they omit as well as include, and the omissions of potential problem definitions, explanations, evaluations, and recommendations may be as critical as the inclusions in guiding the audience" (Entman, 1993, p. 54). Within my study, frames emphasize the narrow lens through which VR is defined by industry leaders, revealing what is included and/or excluded as they communicate and 'promote' their 'interpretation' of VR.

One of the primary goals of a frame is to mobilize particular audiences and/or ideologies. Lasse Lindekilde (2014) writes, "The starting point of frame analysis is that discursive practices of movement actors are designed to mobilize adherents and demobilize opponents to either challenge or reassure the social order" (p. 206). For Lindekilde, a frame analysis examines "how existing 'objects' or 'topics' are framed by different actors, bending their meaning in certain directions" (p. 200). The differences between Lindekilde's and Entman's approach are due, in part, to their focus: Lindekilde focuses on social movement research rather than political news media as Entman does. Yet both approaches contain relevant insights for the present study, with Entman providing a lens for a top-down dissemination of ideas and Lindekilde providing a lens for how that information spreads. Lindekilde stresses that while frames involve the mobilization of particular ideologies, the actors involved are not passive vessels of ideology, nor do their

actions have deterministic outcomes. Yet the discursive work of these actors is nevertheless an attempt to draw an audience towards a particular action.

Chapters 3 and 5 employ a frame analysis to examine how industry leaders seek to mobilize audiences and ideologies through particular inclusions and exclusions. Chapter 3 uses the approach to provide an examination of claims of 'revolutionary' newness; Chapter 5 examines claims about the physical and transformative potential of VR, which in turn suggest ontological and epistemological constructions. I applied a qualitative, grounded approach (Charmaz, 2006) to hand code and identify themes from sources dating from 2012-2018, reaching a point of saturation at approximately 100 sources. In most cases, the sources were selected because they featured an industry leader whose views purportedly represent a company's views (e.g., Mark Zuckerberg at Facebook, Michael Abrash or Palmer Luckey at Oculus, or Clay Bavor at Google). As Lindekilde (2014) describes, because frame analysis is concerned with particular 'movement actors' (industry leaders in this case) text or speech acts about or by these actors is intentionally sampled, meaning that once I identified an industry leader, I would search for additional news articles, blog posts, and industry conferences specifically featuring that industry leader within the study timeframe. The grounded, inductive approach was an attempt not only to see what is repeated across the broader categories of the problems, solutions, and motivations that are presented (Lindekilde [2014] uses the terms 'diagnosis', 'prognosis,' 'motivation' to describe initial guiding categories), but also to identify industry leaders whose presence was repeated, despite a lower public profile. This was the case with Michael Abrash and Clay Bavor, in comparison with more prominent figures like Mark Zuckerberg and Palmer Luckey.

My data collection is similar to Foxman's (2018) 'stockpiling' in that I also gathered sources over a two-year period from what he calls an 'interconnected media environment' that spans developer blog posts, news media, promotional media, videos, and talks at developer conferences published online. It is a cumbersome collection. As just one example, my subscription to the 'news round up' from enthusiast website *Road to VR* dates back to May of 2016, meaning that during the data collection period, I had received over 800 emails linking over two thousand articles, which helped to confirm themes and trends across the industry, and which often reported on and/or provided links to industry events and conferences. When industry-facing or developer-facing sources such as these featured industry leaders, I would seek out both alternate reporting from more traditional news outlets (e.g., *The Guardian,* or *The New York Times*) as well as the original source of the statement. As such, the majority of sources selected for this study—i.e., featuring industry leaders—were collected from publicly available talks from industry conferences uploaded to a dedicated YouTube channel (e.g., 'Google Developers'), which also offers an example of how industry discourse is made public. Google's industry conference is referred to as Google I/O, Facebook's as F8, and Oculus's as Oculus Connect. Since conference talks and interviews are published on YouTube, I often expanded this initial selection by clicking the next 'recommended' video, or searching within the conference's channel. Incidentally, over the two years of data collection, I noticed improvements to Google's automatic transcription of most YouTube videos—a valuable resource—which allowed me to organize and collect text-based copies of the sources in question, and search across the corpus of data for repeated language. The ability to use the transcription service on YouTube videos also shows some of the interpenetration of the subject of research and the tools to do that research. In the same way that a technofeminist approach seeks a middle ground between utopia and dystopia

(Wajcman, 2004), any critique of technology requires the addendum that the technology also makes the critique possible.

As my frame analysis in Chapters 3 and 5 seeks to illustrate major trends and strategies, in Chapter 4, I provide a case study of Oculus founder Palmer Luckey—who was promoted as today's VR 'wunderkind' (Ewalt, 2015), just as Jaron Lanier was before him—in order to further contextualize VR discourse and its broader frames. The case study is well suited to an examination of contemporary subjects involving multiple discourses and multiple forms of evidence (Yin, 2014). The data included range from the personal to the sociocultural, e.g., from Luckey's tweets to articles that proclaim their support of Luckey's work. Of particular interest are examples of 'account giving' (Gibbs, 2004, p. 311), in which statements or positions operate as efforts to legitimize or justify particular practices. Palmer Luckey, due to his status, popularity, and trajectory between 2012 and 2018 (a rise, a fall, and the beginnings of another rise), offers a compelling case. Within these temporal bounds, I describe events and conditions that took Luckey from the promotion of VR for games to the promotion of VR for United States defence. The case consists of three overlapping chronological sequences, presenting the dominant discourse around Palmer Luckey before layering the contextualizing information that complicates this rise of contemporary VR. Framed as yet another mythic White 'pioneer,' Luckey is representative of a longer line of singular, male 'innovators' whose identity becomes aligned with their product. The technofeminist view emphasizes that discourses of 'innovation' and 'progress' have political consequences for those who are already marginalized. Focusing on Palmer Luckey helps to show the consequences of discursive frames that can begin with a seemingly innocuous call for games in VR while drawing support from the misogyny and antifeminism of gamergate and the racism of alt-right neo-Nazis.

Throughout this dissertation, I argue that industry leaders frame a default and problematic support of the hegemonic status quo of technological design while also promoting a consumerist desire to participate in this 'future.' A central premise of this work is that VR is remade by the discourse of industry leaders, whose frames offer insight into who and what is included and excluded in their accounts of the possible histories and possible futures of VR. In her work on colonial histories, Ann Stoler (2016) describes a method that acknowledges the messiness of history, and that demands an "alertness to those haphazard moments when narratives are revised, when dissension is demoted or displaced—to those small gestures that have made some historical accounts more cited, speakable, credible, and amenable to recounting than others" (pp. 23-24). Drawing on Michel Foucault, Stoler argues that researchers must examine how "something has come to be reflected on, has become made 'real' as a discernible knowledge-thing" (p. 28), both epistemologically and politically. Amid apparent public interest and the promotion of multinational corporations, I contend that VR is in a 'haphazard moment' of revision, becoming 'real' (again). As industry leaders outline their ambitions, values, and plans, there is an opportunity to question this 'recounting' of consumer VR.

Conclusion

In the leadup to the 2016 US presidential elections, CNN partnered with NextVR to 'make history' (CNN, 2015) by live-streaming the democratic candidates' debate in VR. At *Wired*, David Pierce wrote that as the broadcast neared its conclusion, the stream abruptly stopped: "[Bernie] Sanders is winding up for a rousing climax, an error message pops up before my eyes. My phone has overheated, the Oculus software says, and the Gear VR headset needs a break to cool down" (Pierce, 2016, para. 1). Pierce's account as 'a disembodied set of eyes' details technologies that are seen and unseen. The VR 'experience' required software updates, a

Samsung smartphone, a headset, software. It required several high-resolution cameras at the venue, that, due to the streaming quality, showed the candidates as 'animatronic not-quite-people.' For Pierce, wearing a headset prevented him from seeing and engaging with content on Twitter and Facebook, prevented him from engaging with real-time fact-checking. Yet it showed aspects of the event that were not in the TV broadcast: the scale of the TV production including the CNN cameras and crew, the small gestures of the news anchors and candidates, the bald head of the man in front of one of the cameras. The camera capturing content for TV showed both more and less than the camera capturing content for VR; the experience in VR offered both more and less.

This broadcast, ostensibly about political discourse, is an apt metaphor for the contemporary politics of VR—what is seen and not seen—in the layered relationships within (or despite) interrelated technologies, companies, content, and people. Unseen in the debate broadcast is the $30 million (USD) that NextVR would receive in seed funding from Time Warner and Comcast (Roettgers, 2015)—broadcast conglomerates dipping their toes into immersive media, indicating a symbiotic rather than 'disruptive' relationship between old and new media. Unseen in this example is the hand of D. J. Rollins, co-founder of NextVR, who, like others in the VR industry, would help shape discourse about the potential of VR. Unseen is the participation of other media sources in the dissemination of that same discourse. Speaking to Liz Claman of Fox Business at the Consumer Electronics Expo in early 2016, Rollins describes VR as an embodied, active version of TV: "You're no longer watching it; you're in it, you're there" (Fox Business, 2016, 1:10). The interview shows how Claman participates in the hype only moments after putting on the headset. "This is unbelievable," she says. "It goes from—in a *way*—making you a viewer to an actual participant" (1:40). "Exactly," Roller replies, going on to

claim that VR will be a medium for everything: "it's all coming in virtual reality" (1:47). With apparent concern, Claman asks, "What does it really mean, though, D. J.? Are we going to be almost antisocial wearing these things?" (2:00) Rollins is quick to reply, "I think this is going to be one of the most social mediums on the planet" (2:07). Within the space of the question and the answer, VR wavers between dystopia and utopia. Throughout this portion of the interview, an on-screen caption reads, "Through the Lens of NextVR" (1:09). Across a network that continues to expand its reach, VR is reminiscent of older technologies, older promises, and older unequal relations. In this sense, VR becomes a lens through which to see the world; VR becomes a lens to view politics.

As technologies are made to sound new while they perpetuate old norms, a technofeminist perspective offers a framework to better understand the ways that the entangled, 'material-discursive' (Barad, 2003) characteristics of VR may perpetuate unjust sociotechnical arrangements. To better understand the politics of VR requires an examination of how and why VR continues to discount and exclude women, people of colour, and other marginalized identities, and how VR reinforces existing systems of power and control. Providing this analysis is also an attempt to elucidate possible alternatives, as well as to identify what makes those alternatives difficult to achieve. As VR becomes the focus of the tech sector again, a long history of technofeminist and other feminist traditions advocating for alternatives emphasizes how difficult it is to counter structures that maintain unequal, male-dominated control. Repeated problems across decades of technofeminist scholarship—across a variety of contexts—show that alternatives are both elusive and necessary. In a recent TED talk, Kimberlé Crenshaw (2016) identifies frames as a crucial part of the ability to recognize what and who is included:

> Without frames that allow us to see how social problems impact all members of a targeted group, many will fall through the cracks of our movements, left to suffer in virtual isolation. But it doesn't have to be this way. (Crenshaw, 2016, 04:34)

Recognizing the ways that current frames exclude is a necessary step towards destabilizing the unequal norms of contemporary VR, and towards establishing the conditions to create new frames and new networks. If the discourse of contemporary VR is one of the 'stabilizing' forces within its web of relations, a search for alternatives might begin by analyzing (and destabilizing, contesting) how industry leaders envision the history and future of this technology.

Chapter 3 - "This Would Be Sweet in VR"[5]: On the Discursive Newness of Virtual Reality

Introduction: Meet the New Boss

> Then I'll get on my knees and pray
> We don't get fooled again
> Don't get fooled again, no, no
> Yeah!
> Meet the new boss
> Same as the old boss
>
> —Peter Townshend, *Won't Get Fooled Again*.

It is tempting to think that virtual reality is new. Pronouncements from developers, industry leaders, and journalists claim that this is 'just the beginning' (Abrash, 2018) of a 'revolution' (Ewalt, 2018), and anyone developing for contemporary VR is a 'pioneer' (Recode, 2016) in a technological 'wild west' (Reimer and Schwartz, 2014). It is true that there are new headsets and new privacy policies, but virtual reality is not new. VR has a long history of remaking the real into alternate versions of itself. Take, for example, Ivan Sutherland's 3D head-mounted display (1968). The Association for Computer Machinery calls Sutherland's device the "first virtual reality and augmented reality head-mounted display system" (Burton, n.d., para. 9), even though it was preceded by Morton Heilig's work (1960, 1962), including the Sensorama. Even the Google Cardboard headset, introduced in 2014 (Google Developers, 2014), is preceded by a cardboard VR viewer from the Institute for Creative Technologies at the University of Southern California (Belman, 2012). Non-digital VR—i.e., VR that is not powered by digital

[5] Bavor, C. (2015). "This would be sweet in VR. (via @apod)" [Tweet] Retrieved from https://twitter.com/claybavor/status/643473771127422978

technologies—can be traced back to the View-Master in 1939[6], or to the stereoscope of the 1800s (Gurevitch, 2013), or to the zograscope of the 1700s (Blake, 2003). VR is not new.

In this chapter, I argue that declamatory statements by industry leaders about VR are also statements of legitimacy, promising an imminent and revolutionary newness while reaffirming a social status quo by targeting dominantly white, male developers with the colonial language of 'pioneering' expansion. This discourse strives to place VR within a preconstructed history, making assurances of its great potential while excusing current faults and eliding its gendered and colonialist media histories. These discriminatory contexts are also not new, suggesting an ongoing need for interventions. As Jenson and de Castell argue (2013), research must go beyond documenting inequality, and should instead focus on "discerning and disclosing responsibility, public accountability and intervention" (p. 80). This call to action is especially important amid industry discourse that guarantees 'diversity' and 'inclusion' despite contexts and cultures of discrimination and harassment. Each section in this chapter focuses on a particular framing strategy. For clarity, these framing strategies are considered separately—as individual vignettes—but should be understood as overlapping, since each of these frames comes from industry leaders and corporations. Frames are constructions; what frames exclude is as important as what they include (Entman, 1993). As a brief intervention, this chapter concludes with an exercise in reframing, expanding the edges of one of the beginnings of VR to show what is not normally shown: a gendered and racialized history of money, opportunity, and institutional power, and the decontextualized reference to a story about a young man with a sword hanging

[6] Incidentally, the View Master and modern 3D head-mounted displays follow a similar trajectory in that they were used by the American military before becoming a consumer good marketed to children (Gurevitch, 2013).

over his head. Contextualizing the 'newness' of VR opens opportunities to contest its depoliticized histories, and to question its imagined futures.

Everything is Awesome: Framing Belief, 'Pioneers,' and the 'Wild West'

> Everything is awesome, everything is cool when you're part of a team
> Everything is awesome, when you're living out a dream
>
> —Tegan and Sara, *The Lego Movie*

In an article for *The Atlantic,* Ian Bogost (2016) writes, "After decades of experiments and false starts, it would appear that commercial VR is finally here" (para. 1). After describing some of the devices that preceded the Oculus Rift, as well as some of the depictions of VR in popular culture, Bogost concludes by proposing that we have already been entangled in VR without noticing it, wired into a 'collective hallucination'[7] due to a dependent relationship with computers and smartphones. For Bogost, then, virtual reality is finally here, but it always already was. If Bogost is a skeptic, consider a believer. At the Game Developers Conference (GDC), Jesse Schell (2016) declares, "It's an exciting time, VR is finally here, which is so awesome. And the good part is this isn't some fad, this isn't the Kinect or the Super Scope 6 or something like that, it's going to stay" (00:50). As if to demonstrate his conviction, Schell offers 40 predictions for VR into 2025, ranging from education to pornography. For Schell, then, VR is finally here, and it is always already awesome.

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[7] With this phrase, Bogost appears to be making a direct reference to William Gibson's *Neuromancer* (2000/1984). The phrase in my copy of *Neuromancer* is different, however, not "collective" but "consensual": "… jacked into a custom cyberspace deck that projected his disembodied consciousness into the consensual hallucination that was the matrix" (p. 5). I comment on some of the language of fiction that informs industry leaders' conceptions of VR in Chapter 5; within the context of this chapter, the notion of consent is important amid the accounts of sexual harassment in VR that I will discuss shortly.

Schell's characterization, as opposed to Bogost's, offers a snapshot of the general framing of contemporary VR. It is framed as a beginning with so much evident promise that its future is certain. In the years leading up to the release of consumer VR, industry leaders seemed to draw on a similar set of interlocking ideas. Presenting these ideas at industry conferences and events, their audience includes developers within an industry that is statistically skewed white and male (Myers, 2018). Women make up only 31% of the total workforce at Google and 36% at Facebook, with lower percentages for women working tech-related jobs and in leadership roles (Richter, 2018). In this section, I weave through some of the claims presented to this audience to illustrate a logic in which an idealized first experience appears to inevitably produce an evangelist 'pioneer.' It is a logic that establishes a common language and identifiable stages, from before a prospective developer puts on the headset, to a transformative first experience, to a shared goal of charting these 'new frontiers.' It is as if to establish a driving motivation to both define a medium and define those who would be the first to shape that medium.

For industry leaders, the first experience in VR appears to be a pivotal moment: all it takes to believe in VR is to put on a headset. For example, at Oculus Connect 2, the chief technology officer, Michael Abrash (2015) claimed, "Once you've experienced it, it's obvious that it's going to change the world in a big way" (00:34). Palmer Luckey had been using similar rhetoric as early as 2014:

> It used to be the people who tried virtual reality were actually the ones who were least excited about it because they would try it and realize that it wasn't all that great. And then you know it was hard to continue being really excited. Now it's kind of the opposite. The people who try virtual reality headsets are the ones who are most excited about the technology because they see the promise and they see the future. (Sonne, 2014, 2:18)

For Luckey, even if interest was initially relegated to 'ultra-hardcore virtual reality enthusiasts' (Purchese, 2013), putting on a contemporary headset—no matter what content is displayed—became equivalent to 'seeing the future' (Sonne, 2014). This is the language of faith: a baptism by headset to remove the scales from the eyes. It is a waiting opportunity for the soon-to-be converted.

When Clay Bavor, head of VR at Google, frames this first experience as transformative, it is also considered integral to an understanding of VR, helping to develop a common language and a common experience:

> I wanted to talk just briefly about VR and why it's important to us, and if I can just do a quick poll, how many people have been in a VR system where you've had that moment of like, oh my God I'm there, I'm somewhere else? [Many audience members raise their hand.] I love this, this is like the highest ratio of any talk I've given. So that's great, so you know what this is about, you know what I'm talking about now. For people who haven't, for folks on the livestream, there's no substitute for actually being in one of these demo rooms. (Google Developers, 2016a, 00:46)

Conducting his 'poll' at a Google Developer conference, it is perhaps unsurprising that an apparent majority of the audience raise their hand. Yet Bavor still goes on to describe the 'immersion' and 'presence' of a first experience, providing a description of how his audience should feel or should have felt, as well as the appropriate language to describe that experience. As such, it is a means to establish insiders and outsiders—those who have tried it and those who have not, those who can describe the appropriate experience, and those who cannot. It establishes some of the conditions for what is already an exclusive participation in the shaping of the medium.

In addition to the common language and the common experience, there is a shared motivation in being part of what is characterized as a 'revolution.' This revolution can be traced at least to the Oculus Kickstarter tagline, "Join the revolution" (Kickstarter, 2012, 4:40). Abrash (2016) reinforces this call to participate in a revolution with flattery and a sense of shared purpose:

> If there's one thing you take away today, this should be it. The way technological revolutions actually happen involve smart people working hard on the right problems, at the right time. Take a good look around this room, because when it comes to the future of VR, that, my friends, is us. (31:19)

Somewhat confusingly, Abrash is referring to a quote by Oculus Chief Architect, Atman Binstock (Oculus, 2014a), who is paraphrasing personal communication with Michael Abrash. This indicates that the phrase, 'smart people working hard on the right problems,' was used by Abrash to recruit Binstock, and is now being used again to motivate interest. In this way, Abrash equates himself and Binstock with the room of developers: they are all 'smart' and part of the 'revolution.'

For some industry leaders, these 'revolutionary' developers are also 'pioneers.' In 2015, Brenden Iribe, then CEO at Oculus, said, "It's such an early day that we view everybody as pioneers" (Recode, 2016, 13:56). Similarly, opening his keynote at Oculus Connect 2, Abrash (2015) stated, "I urge you to take a moment now and then to remember how unbelievably fortunate we all are to have the opportunity to be VR pioneers. We're creating a whole new way for people to interact with technology" (03:07). The use of this language is not company-specific. At Google I/O in 2017, within a single session, Mike Jazayeri, product manager for the Google Daydream VR headset, refers to the 'pioneering spirit' of their industry partners; Andrey

Doronichev, director of product management, also refers to 'pioneering' industry partners; and Jennifer Holland, program manager, refers to the 'pioneer program' of their educational Expeditions VR project for children (Google Developers, 2017). This repeated language suggests a broader effort to mobilize audiences, to align interest in the technology by creating a shared identity.

A related factor is an imagined lack of rules among developers. In a talk at the Steam developers conference, designers from games studio Owlchemy Labs (which was later acquired by Google) said:

> We call this talk the wild west of VR and there's a reason for that. The rules haven't been written yet. Very rarely does something happen where there's literally no rules written and you have to figure it out as you're going along. (Reimer and Schwartz, 2014, 03:48)

While the 'wild west' in this talk echoes the 'pioneering' discourse, in practice, the notion of 'no rules' also disregards decades of academic literature on VR while framing these developers as the ones to 'write' the rules. "We have not learned every single rule," Chris Milk (2016) says in a TED talk. "We've barely learned any at all, but we're already trying to break them to see what kind of creative things we can accomplish" (07:29). To these privileged few, not only do 'rules' not apply, but their responsibility in writing and 'breaking'[8] the rules is unquestioned.

For these game developers, the 'rules' that they write and create for VR apparently rely on the cultures and contexts of games. Recalling their success in a talk at GDC (Hackett and

[8] Facebook's 'move fast and break things' motto was changed in 2014 (Murphy, 2014). Presumably, they had broken too many things.

Skillman, 2017), the developers of *Tilt Brush* (also acquired by Google) said that their previous experience was only beneficial in some occasions:

> What we realized is that it's just two naive game developers applying game development principles to a whole bunch of situations that were not video games. And sometimes, a lot of times, it was very beneficial for us to think in this way, and then there was other times where it was clear that, like, we didn't have a clue what we were doing. (00:47)

As evidenced by the relatively rare Google acquisitions in these success stories, developers tasked with establishing the 'rules' for VR were also cheap labour for corporations, risking their own time, effort, and reputation to create content for a platform that was known to be flawed. By 2017, developers were still echoing the sentiment that there were no rules, thus enlisting themselves as potential pioneers of the medium: "As developers and artists, we have the opportunity to make up the rules" (Oculus, 2017b, 00:15).

This language of 'pioneers' participating in the 'wild west' of VR is not quite the same as the characterizations of individuals as pioneers (more on that soon) in news media about VR (e.g., Crecente, 2016; Ewalt, 2015; Robertson, 2017; Volpe, 2015). Instead, it is a movement, a grouping—a 'spirit'—that employs the language of transformative belief while echoing the gendered and racialized discourse of settler colonialism (Perry, 2000). As a discursive frame, an ignorance of this history does not negate its present-day impact. It is troubling that the language of discovering 'new frontiers' (whether employed by industry leaders [e.g., Abrash, 2017], or news media [e.g., Statt, 2014]) in which a select few define the rules, should be considered so appealing. Even within digital contexts, feminist critiques of this kind of colonialist language can be traced to the presumed 'borders' and 'frontiers' of cyberspace (Nakamura, 2002). To repeat the fantasy of the mythic conquering of the West is to repeat and endorse old justifications based

in ethnocentrism, racism, violence, and colonialism. Here it is presented as desirable. As Anne Bonds and Joshua Inwood (2016) argue, settler colonialism is better understood as ongoing, rather than historical. For Bonds and Inwood, settler colonialism is a logic, a structure, a system of beliefs and resultant actions that continues to affect race relations while perpetuating notions of white supremacy and privilege. Whether the framing is deliberate or not, the majority of these 'pioneering' VR developers are white, looking upon territory that is old while claiming it is new.

Scaly Surfaces and Filmy Forms: Framing the Preconstructed History of VR

> I contend, then, that things emit filmy forms and images from their surfaces; and the proofs that follow will enable even the dullest wit to understand that I am right.
>
> —Lucretius, *On the Nature of Things*

In an effusive article for *Forbes* featuring Palmer Luckey, David Ewalt (2015) describes his experience of a prototype that preceded the Oculus Rift: "The experience feels similar to what it must have felt like to first gaze upon a television nine decades ago at the birth of a new medium" (para. 42). The romantic future that Ewalt 'gazes upon' is not critical of VR, let alone of television, implying that nine decades later, another writer might reverently look back on this 'birth' of VR. While this historicizing functions to equate the success of an 'old' medium for the presumptive success of a 'new' medium, it also begins to reveal how VR is imagined. After declaring that the "potential for VR is enormous" (00:58), Chris Milk (2016) compares contemporary VR to early cinema, to the spectacle of a Lumière brothers' film. For Milk (2016), this is evidence of an auspicious beginning, with VR presented as being on an expressive trajectory from spectacle to art, capable of doing more than any previous medium:

> VR is going to play an incredibly important role in the history of mediums. In fact, it's going to be the last one. I mean this because it's the first medium that actually makes the

> jump from our internalization of an author's expression of an experience, to our experiencing it firsthand. (04:04)

In addition to the assertion that VR provides an unmediated 'firsthand' experience—after the viewer puts as much as a pound of hardware on their head—the framing situates VR within a preconstructed history that is spoken with the future tense sureness of a futurist. To historicize contemporary VR in this way is to establish a common vision for what VR could be, offering the present moment as a unique opportunity to participate in this 'future.'

Participation in this narrative entails belief in a dream of unending progress, a project that is permanently unfinished. For Michael Abrash (2016), it is an 'evolution' that 'we' participate in together:

> I think the biggest reason we're all working on VR now is because of our vision of what VR will become. As VR progresses, that vision will keep evolving too, and we'll always wish it was just a little bit better. But at the same time all our efforts will be collectively taking VR to the next level. (05:36)

As the notion of 'collective' action obfuscates who and what drives this 'progress,' the notion of an 'evolution' culminating in 'our vision' makes that vision appear natural. In a talk at Google I/O in 2016, Rob Jagnow shows a slide depicting the evolutionary 'March of Progress,' marking a point early in the march to represent the current state of VR and Google Expeditions. He then states that evolutionary processes are much more complex, with "false starts and dead ends" (Google Developers, 2016b, 36:18). The evolutionary trajectory justifies current flaws: the flaws are a 'natural' part of the process. To frame a technology as 'natural' is to frame a corporation and its efforts as natural. Similarly, to use 'we,' 'us' and 'our' is to universalize the interpretations and perspectives of the speaker—an implicit dismissal of those who are not

represented by the tech industry. As such, these are selectively constructed histories, with imagined beginnings chosen to illustrate imagined ends. What would happen if 'we' were not so sure of the future of VR? Framing where and how VR fits into a historical trajectory not only frames an imagined future but excludes possible pasts. What if this 'community' chose another beginning?

In 1859, Oliver Wendell Holmes Sr., who coined the term, 'stereograph,' and who created and popularized what became known as the 'American Stereoscope' (1952/1869), wrote of the effect of viewing a stereograph with the kind of excitement that today's VR receives. His description of the 'first effect' and of what the 'mind feels' could be supplanted for the descriptions of VR provided by industry leaders:

> The first effect of looking at a good photograph through the stereoscope is a surprise such as no painting ever produced. The mind feels its way into the very depths of the picture. The scraggy branches of a tree in the foreground run out at us as if they would scratch our eyes out. The elbow of a figure stands forth so as to make us almost uncomfortable. Then there is such a frightful amount of detail, that we have the same sense of infinite complexity which Nature gives us. A painter shows us masses; the stereoscopic figure spares us nothing—all must be there, every stick, straw, scratch, as faithfully as the dome of St. Peter's, or the summit of Mont Blanc, or the ever-moving stillness of Niagara. The sun is no respecter of persons or of things. (Holmes, 1859, para. 34)

In Holmes's (1859) description, the image displays the natural so vividly, so accurately, that it produces physical effects: the branches might 'scratch our eyes out,' an elbow is enough to 'make us almost uncomfortable.' It is a description that can alternately entice and frighten. Is this

not also the 'last' medium, which, in Milk's (2016) estimation offers "a unique, direct path into your senses, your emotions, even your body" (06:47)?

These sensory qualities may be the reason that Holmes (1859) opens his essay by referring to the philosophies of Democritus, Epicurus, and Lucretius, telling the reader to look to book 4 of Lucretius if "curious on the matter" (para. 1). I was curious; here is how Lucretius (2001) puts it in book 4 of *On the Nature of Things*:

> In the first place, many things visibly discharge matter. Some of these discharges are rare and diffused, like the smoke emitted by wood or the heat by fire; others are of a closer and denser texture, like the sleek coats that cicadas periodically shed in summer, or the superficial membranes of which newborn calves divest themselves, or again the vesture that the slippery serpent works off on the thorns as is evidenced by the familiar sight of brambles decorated with its fluttering slough. In view of these visible discharges, there can be no doubt that subtle images too are emitted from the surfaces of things. (2001, pp. 101-102).

This description of 'discharged matter,' of 'membranes,' as well as the more 'subtle images' is integral to Lucretius's theory of perception. For Lucretius, things are always shedding their 'filmy forms,' or, in Latin, their *simulacra.*

With this in mind, Holmes offers a more nuanced view of the possibility (and danger) of the stereograph than the promoters of its modern equivalent. Yes, we might capture a moment of 'discharged matter,' but this capture also portends the danger of anthropocentric power, and a deadly control over nature:

> We have got the fruit of creation now, and need not trouble ourselves with the core. Every conceivable object of Nature and Art will soon scale off its surface for us. Men

> will hunt all curious, beautiful, grand objects, as they hunt the cattle in South America, for their skins, and leave the carcasses as of little worth. (Holmes, 1859, para. 50)

While Chapter 5 will return to the theme of (corporate) objectification through the apparatus, within the context of this chapter, Holmes's notion of the 'fruit of creation' (and indeed his allusion to Prometheus at the end of his essay) conveys the danger of this pursuit. It is a 'hunt' that kills the very thing it is attempting to convey, emerging with a hide and calling it an animal.

The stereograph shows that there is a longer history to the 'visual dominance' of today's VR, which allows "white pioneers to film images of 'the natives' in peripheral global locations and transport them back to Western centres" (Leotta and Ross, 2018, p. 154). To support this argument, Leotta and Ross (2018) cite Brooke Belisle's (2013) reading of stereoscopic images from the mid 1800s, who writes, "By creating the perception of virtual co-presence, stereoscopic representation supported colonialist fantasies about collecting all the world's diversity and its historicity under the auspices of one coordinating point of view" (p. 5). Neither were these mediated fantasies new in the 1800s. As Erin Blake (2003) argues, the zograscope 3D viewer of the 1700s was an instrument that constructed an idealized image of the public and the world, viewed from the detached position of the domestic sphere. Blake writes, "Zograscopes told a story of public space as available, accessible, dynamic, and vibrant, but controllable, clean, and polite" (p. 5). With its removal of the physical, sensory characteristics of its represented worlds, the zograscope presented a commodified, static, and repeatable experience (p. 18). Like contemporary VR, the zograscope was an exclusive instrument of a limited elite. As yet another seeing apparatus, this alternate history presents the VR headset as a tool used for control, a colonialist project in which the Western viewer extracts value from distant lands and calls it knowledge and progress.

When I began looking for stereographs to see what effect they would have on me, the first set that I found was not the 'admirable' examples that Holmes (1859) recommends to his readers, but rather those he warned against, the "vulgar repetitions of vulgar models" (para. 47). The set I found is called 'Mr. & Mrs. Turtledove's New French Cook,' stereographed (to use Holmes's term) by William Herman Rau (1902). The first print in the series shows the titular cook, smiling at the camera, rolling out dough. Mr. Turtledove enters in the next print, saying, "You sweet thing, when did you arrive?" (print 2). By the next print his hands are on her, and her smile has not left her face, but she now looks at the viewer, as if to make the viewer a participant, as if to invite or implicate my gaze. They embrace in the next print, her smile widens, and still she looks at the viewer. In print five, Mr. Turtledove says, "Sh! Sh! I hear my wife coming" (print 5). Now they are apart, the expression on their faces is serious. As the viewer, I know something they do not: across Mr. Turtledove's back, the French cook's floury hands have left their mark. Evidence. In the next prints, Turtledove is found out by his wife; the cook is fired; Turtledove appears to repent; and a new cook is hired: a man in drag.

The tropes in this story tell us something of the time: the comic effects are premised on the understanding that Mr. Turtledove would immediately make sexual advances on his staff; that the 'French' cook should be so willing; that the husband should be so hapless that he wears the mark of the affair so visibly; that the wife should appear cold by comparison; that the one to pay for this dalliance is the woman, not the man; that we can still never trust Turtledove to be faithful; that a man in drag should be hilarious. Given that I can find these same gendered and sexist tropes in today's media reveals something of our own time, as well. So, perhaps this is yet another beginning of VR as a medium; a demonstration that the medium cannot escape its culture, cannot help but reflect its moment. In this sense, VR presents reality with crucial

omissions; it presents a constructed world for a constructed audience, just as it has for the last few hundred years.

'Good' VR: Framing Diversity and Inclusion

> When race and ethnicity become commodified as resources for pleasure, the culture of specific groups, as well as the bodies of individuals, can be seen as constituting an alternative playground where members of dominating races, genders, sexual practices affirm their power-over in intimate relations with the Other.
>
> —bell hooks, *Eating the Other: Desire and Resistance*

In 2016, two years after Facebook acquired Oculus and expanded the company's mandate beyond games (see Chapter 4 for more on this), Oculus launched its 'VR for Good' initiative. Their blog stated, "Virtual reality has unlimited potential for gaming and entertainment, but it's also a powerful way to drive important social change" (Oculus, 2016a, para. 1). The blog appears to have initially attempted to mobilize filmmakers by framing the possibility of social good as common knowledge: "Filmmakers everywhere see this" (Oculus, 2016a, para. 1). Yet the website for the 'VR for Good' initiative broadens the scope of the claim: "Virtual reality is one of the fastest-growing parts of the tech industry, and has the potential to transform education, improve productivity, advance social movements and broaden the way we think"[9] (Oculus, 2018d, para. 1). The embedded assumptions within the claims of its potential—education needs transforming, productivity needs improving, all social movements are unequivocally good and need advancing, and 'we' need to broaden how we think—are each underwritten by the

[9] The 2019 version of this quote is slightly different: "We have the potential to transform education, improve productivity, advance social movements, and expand our understanding of people and cultures around the world — all through the power of virtual reality." Again, VR mediates understanding; its 'power' is in its ability to 'transform,' 'advance,' and 'expand,' but now more specifically relating to 'people and cultures around the world.'

assumption that this technology is the answer. VR is framed as an object to deliver altruistic social change.

While filmmakers may have been an initial audience of this framing, subsequent descriptions clarified who would be tasked with justifying the social potential of VR. One depiction of these prospective evangelists can be found in the description of Launch Pad, a 2-day 'boot camp' followed by a 3-month 'Live Developer Training' for 'creators from diverse backgrounds' (Oculus, 2018b). The website states, "We hope to inspire developers that represent our global audience to share their voices with the world. By investing in developers with unique perspectives, we can bring more exciting content to VR fans everywhere" (Oculus, 2018b, para. 5). While framing the labour of these creators as a crucial 'investment,' the inclusion of these 'diverse' voices is apparently not crucial enough to be integrated into the company as a flagship effort. Instead, the use of their stories under the Oculus brand through scholarships and training (rather than employment) implies a relatively low-cost co-optation, which moreover appears to conflate 'diversity' with 'unique perspectives.' Oculus (2018b) writes, "This includes women, people of color, members of the LGBTQ community, and anyone who is willing to share how their perspective adds to the 'diversity of thought' in our community" (para. 5). The quotation marks around 'diversity of thought' are unexplained, but the rhetoric stresses that it is the 'unique ideas' of these developers that will help build a 'global audience.' Oculus appears to be suggesting that the best storytellers to generate new content for a global audience are those who are already marginalized by the tech industry.

As a slogan, 'VR for everyone' continues to be aspirational. While 2016 saw the beginning of these initiatives as well as the release of major consumer headsets, it was also the year in which it was said that, already, 'virtual reality has a sexual harassment problem'

(Ehrenkranz, 2016a). Those hoping to enter the VR sector in that year could read about a Japanese game in which players can grope female characters despite their "non-consensual body language and verbal denial" (Ehrenkranz, 2016b, para. 3); or could watch a developer at GDC sexually harass a woman in VR in the name of non-consensual 'research,' concluding that it was 'way, way, way worse' in VR compared to non-VR games (Frank, 2016; Sampat, 2016); or read Jordan Belamire's (2016) account of being 'virtually groped' by another player who heard her voice in a multiplayer game.

Responses to such moments reveal something of how the culture of VR managed its notions of inclusivity. Only a few days after Belamire's account, the developers of the game wrote a cogent, apologetic response (Jackson and Schenker, 2016), describing how they had improved their 'personal bubble' mechanic so that it was more visible, easier to use, and so that it covered the entire body. Previously it had only protected the player's face. "How could we have overlooked something so obvious" (para. 5), the developers asked. They do not suggest that it was something that they missed, quite simply, because their team, or their community, neglected to include women or others with underrepresented experiences. The developers quickly released the code to their improved 'personal bubble' to the developer community. By then, however, Belamire had been the target of misogynist discrediting and victim blaming (Ehrenkranz, 2016c), which has been common to sexual harassment victims since before the phrase became part of legal and popular discourse (Backhouse, 2012).

In an article for *The Guardian*, Arwa Mahdawi (2016) draws on Belamire's example to make a case for greater diversity in VR development, suggesting that while diversity initiatives at Oculus are a positive step, they are complicated by political controversy. In the wake of news that Palmer Luckey funded pro-Trump groups (I cover this in more detail in the next chapter),

Mahdawi draws a parallel to Peter Thiel, the venture capitalist and Facebook board member who gave $1.25 million (USD) to Trump's campaign amid sexual assault accusations. Mahdawi writes that Zuckerberg defended Thiel's participation on the board by calling it important 'diversity'—diversity of thought. In an internal Facebook post, Zuckerberg reportedly wrote, "Our community will be stronger for all our differences – not only in areas like race and gender, but also in areas like political ideology and religion" (see Newton, 2016). As Mahdawi (2016) argues, this problematic understanding of diversity reveals a misunderstanding of power: "Zuckerberg's reframing of diversity is worrying sophistry. Everyone is entitled to their viewpoint, of course. But most people don't have the resources, power and influence that the likes of Thiel and Luckey do" (para. 31). While it may be unsurprising that billionaires like Zuckerberg or Thiel should make statements that appear disingenuous or out of touch, at the time, the revelations about Luckey's political inclinations prompted disillusionment within a space that was said to offer change.

In interviews with Mahdawi (2016), Launch Pad members responded to the allegations by emphasizing Luckey's broader role in the tech sector. While one member said that they were happy to take the money, implying that to do so is to take it out of the hands of the powerful, another implied that doing so normalizes Luckey's politics and normalizes the sexism and racism of tech culture. Whereas Luckey previously represented the promise of VR, he now represented the power of the industry. In a blog post about his experiences as a member of Launch Pad, Dale Henry (2017) addresses Luckey directly when describing his dissatisfaction:

> In my opinion, your actions, as reflected with the inaugural cohort, were those of an opportunist. Down for the glamour shot PR that black, brown, gay, trans, and females give you, but unwilling to put your money where your mouth is. Even when you have the

> money. We're not talking scarcity of resources here at Oculus/Facebook. We're talking diversity as a low priority, and a lack of motivation because you can't see the money shot. (Henry, 2017, para. 19)

For Henry (2017), the funding was disingenuous, a media stunt to promote diversity while spending larger sums of money on conservative causes, not recognizing the value of diversity beyond its publicity. Another member, A. M. Darke (2017), also directs her comments to Luckey, reflecting on a visit Luckey paid to members of Launch Pad, which at the time was seen as a generous use of his time:

> I asked you point-blank about diversity at Oculus.
>
> I was immediately disappointed by your defensive response. First, you told me you didn't know those numbers offhand. When I pressed, you told me you do not lower your standards — that you hire the best. That struck me as disturbing, that you equate diversity with lowered standards. That hiring the best and being diverse were mutually exclusive. I felt a little defeated, to be honest. (Darke, 2017, para. 5-6)

Darke, like Henry, is frustrated by how Oculus, represented by Luckey, implicitly sees diversity: as charity, with an emphasis on 'hiring the best' without addressing the discrimination that women and people of colour face within the industry. Along these lines, 'diversity' initiatives offer a semblance of diversity without requiring the money or the action to make sure that the initiative acts as more than a marketing ploy; 'the best' are those who can already adhere to the standards established by the tech sector.

If those considered 'the best' are represented through spending, funding, or support, the case of the beleaguered VR company Upload presents an ugly example. When Upload's founders faced growing legal pressure after the high of being featured in *Forbes*, it was Palmer

Luckey who reportedly kept them (briefly) afloat with $2.5 million (USD) in funding (Matney, 2018a), which is approximately four times the amount given to the 14 projects funded through the 2017 Launch Pad program (Oculus, 2017a). Published before the lawsuit, the *Forbes* '30 under 30' blurb (Inverso, Vinton, and Berg, 2017) described the reach of the company:

> VR is no longer just for the tech savvy. [Will] Mason and [Taylor] Freeman are focused on media, coworking and education at UploadVR, a VR and AR-focused publication. More than 40 companies use its San Francisco incubation space, thousands of people take part in its online education program—partnered with Google, HTC and Udacity. And the cofounders have hosted more than 20,000 people at 200+ events. (para. 1)

Mason and Freeman would both be named in the lawsuit, which alleged that the founders "purposefully and expressly created a 'boy's [sic] club' environment at work, focused on sex and degrading women, including female employees" (quoted in Matney, 2017a, para. 7). This reportedly included a 'kink room' allegedly to 'encourage' employees to have sex in the office. One of the women who started the lawsuit, would describe how she left sexual harassment at one Silicon Valley office only to face sexual harassment at Upload (Brooks, Quart, and Malter, 2017). The suit was later settled (Mantey and Shieber, 2017; Streitfeld, 2017), and although Upload would finally lay off their last employees and close their offices after Luckey's funding ran out, the VR news website, *UploadVR*, would be unaffected (Matney, 2018a). After the settlement, an apology signed by Mason and Freeman included the following statement: "Our primary focus at Upload is education, which we believe is the key to growing the mixed reality ecosystem. We are deeply committed to creating an inclusive community to empower the pioneers building the future" (quoted in O'Brien, 2017, para. 5). Here, again, is the rhetoric of

inclusion and the possibility to be part of this 'community,' but only if 'we' choose to be among its young, white 'pioneers.'

Given the prevalence of the kind of language used in the statement, it is perhaps unsurprising that 'building the future' is not a unique phrase either. Zuckerberg (2014) used a version of it after the Oculus acquisition:

> The future is coming and we have a chance to build it together. I can't wait to start working with the whole team at Oculus to bring this future to the world, and to unlock new worlds for all of us. (para. 9)

Brenden Iribe (2016) echoes the sentiment in an Oculus blog post: "I couldn't be more excited to run to work every day and build the future of VR with all of you" (para. 9). And in an early interview, Palmer Luckey says, "We're focused on building the future, not thinking what will happen when we do it" (Sonne, 2014, 14:35). This statement is brief, at the end of an interview, and immediately qualified by Nate Mitchell, but like the other statements it suggests an attitude that prioritizes technology, prioritizes 'building,' while avoiding responsibility for what is made. In an article for *Engadget,* Violet Blue (2017) argues that VR entered the mainstream with the benefit of buzz words like 'disruption,' providing technology companies license to do work with unchecked social and political ramifications. What is happening, so far, is that they are continuing to build the same unequal social structure that they inherited.

Embedded within a culture of sexism, discrimination, and harassment, the promise of inclusion in initiatives like Oculus Launch Pad is an appropriation, not only of content and experiences, but of bodies, of workers, into a system that does not actually support them. Henry's (2017) account of a diversity luncheon at Oculus demonstrates not only his

dissatisfaction with the company's diversity efforts, but also his frustration that these efforts were not known to the rest of the company:

> Imagine my surprise at the fact that the two Oculus employees who were sitting at my table had no idea what the Launchpad program was. I mean, they had ***no*** idea. To be fair, I'm positive they weren't the only employees in the room to be in the dark. Even though these employees were at a luncheon specifically for diversity. I'm not blaming the employees. This just tells me that management didn't do their job to let the company employees know that this program existed. (Henry, 2017, original italics and bolding, para. 15)

What this internal lack of knowledge about the program shows is that while one of the purposes of the initiatives may have been to showcase and support marginalized voices, there was no expectation that these efforts would have any effect on the employees, hiring practices, or management. The existence of the program was deemed enough.

According to bell hooks (2013b), diversity efforts that do not work to overturn the systems and structures that create inequitable relationships can only bring a 'veneer of diversity':

> Diversity could not and cannot have meaningful transformative significance in any world where white supremacy remains the underlying foundation of thought and practice. A huge majority of unenlightened white folks believe that the mere presence of "difference" will change the tenor of institutions. And while no one can deny the positive power of diverse representation, representation alone is simply not enough to create a climate supportive of sustained diversity. Even though racial and ethnic integration brings a veneer of diversity, racism remains the norm. (p. 27-28)

For hooks (2013b), 'challenging and changing' the myriad ways that the 'imperialist white supremacist capitalist patriarchy'[10] is enacted requires education that both acknowledges and affirms diversity and difference. This education must ensure literacy—including computer literacy—for everyone (p. 28). If VR is to be 'for everyone,' the distribution of power within corporate VR, from production to dissemination, must change.

These initiatives, filtered through the larger aims of the corporation also show that the promise of newness—of change—is seductive, both to those represented by the status quo and to those oppressed by it. One way to interpret this type of seduction is through the lens of what bell hooks (2006/1992) calls 'eating the Other': "[M]arginalized groups, deemed Other, who have been ignored, rendered invisible, can be seduced by the emphasis on Otherness, by its commodification, because it offers the promise of recognition and reconciliation" (p. 370). When the output of this labour is framed as diverse and as representative of the embodying potential of VR, it reaches the consumer as an appropriation of experiences and a dismissal of larger systemic issues. For hooks (2006/1992), it 'deflects' the politics of representation by making it seem desirable to inhabit the bodies and experiences of 'the Other':

> [I]t establishes a contemporary narrative where the suffering imposed by structures of domination on those designated Other is deflected by an emphasis on seduction and longing where the desire is not to make the Other over in one's image but to become the Other. (p. 369)

[10] hooks writes that when she talks about the 'imperialist white supremacist capitalist patriarchy' in speeches, audiences laugh. She writes, "The laughter is itself a weapon of patriarchal terrorism. It functions as a disclaimer, discounting the significance of what is being named. It suggests that the words themselves are problematic and not the system they describe" (hooks, 2013a). It is important to "name what hurts" (p. 10).

Within the context of content produced by diversity initiatives, the promise of the communicative power of VR has several effects: the marginalized 'other' is promised 'recognition and reconciliation'; the privileged viewer is promised understanding and the perception of political solidarity; and the corporation is provided the labour of these efforts at a discount, along with the perception of humanitarian altruism.

When the commodification of 'diverse backgrounds' in VR is hidden within frames of inclusion, it represents an expression of control—a consumerist drive to appropriate and market the cheap labour of those who are not represented by the industry. Diversity initiatives could—and one day might—act as an opportunity for counter-hegemonic discourse, an opportunity to speak from 'the margins' even while operating within the 'centre' (hooks, 1989a), which in this case would entail employment at Oculus. Yet if these voices remain at the margins even while the company claims to "drive important social change" (Oculus, 2016a, para. 1), the potential of these initiatives as a site of resistance is muted and depoliticized by the company's failure to account for how they contribute to the systemic factors that create and maintain that marginalization.

The Sword of Damocles: Reframing a Beginning

> The Sword of Damocles is hanging over my head
> And I've got the feeling someone's gonna be cutting the thread
> Oh, woe is me
> My life is a misery
> Oh, can't you see
> That I'm at the start of a pretty big downer
>
> —Richard O'Brien, *Rocky Horror Picture Show*

Within the hype surrounding contemporary VR, there has been an effort to identify a single individual—pulled from a technological rather than photographic or cultural history of

VR—who is responsible for the conceptualization of the medium. It is predominantly a gendered, patriarchal pursuit. Journalists have identified at least two separate 'fathers' of VR (Bernard and Tweedle, 2017; Crecente, 2016), two 'godfathers' of VR (James, 2015; Mayol, 2016), one 'godmother' of VR (Helmore, 2015; Volpe, 2015), and one 'face' (Purchese, 2013). There is, apparently, no mother of VR. While these possible origins also negate the purported newness of VR, they help to reinforce narratives of male-dominated control and ingenuity, setting a precedent for today's VR. Each of these individuals has been called a 'pioneer.' As Suchman (2009) describes, in order to analyze discourses of technology that propose 'change' while maintaining existing structures, it is important to deconstruct notions of innovation and innovators. Doing so is an opportunity to "decenter sites of innovation from singular persons, places and things to multiple acts of everyday activity, including the actions through which only certain actors and associated achievements come into public view" (Suchman, 2009, pp. 1-2). By way of intervention, I offer a reframing of one of these histories as an effort to include some of what it excludes. Lindekilde (2014) writes that the frame in Erving Goffman's (1974) original conception focuses attention. My intervention on one of these histories simply broadens the borders of the frame to focus attention on some additional aspects that are commonly overlooked.

Consider Ivan Sutherland, one of the presumed godfathers of VR for his 3D-head mounted display (1968), created with his student Bob Sproull. In a talk thirty years after what Sutherland conceptualized as 'The Ultimate Display' (1965), Sutherland notes that in addition to still benefiting from Harvard endowments that date back to the 'triangle trade' (i.e., the slave trade), his own research had financial assistance from the Air Force (which was not considered

controversial at the time) and the CIA (which was considered controversial at the time[11]) (Sutherland, 2017). These connections are a reminder of the close ties between the government and technological development; Sutherland casually mentions that he 'made some friends' in the CIA during his time at the Advanced Research Projects Agency (ARPA) in Washington, which later became known as the Defense Advanced Research Projects Agency (DARPA). This was a time in which development for computers was predominantly driven by white men (despite female programmers) and closely tied to the military-industrial complex (Bezio, 2018; Dyer-Witheford and De Peuter 2009). As Dyer-Witheford and De Peuter (2009) note, the same origin can be identified for the Internet, for personal computers, and for video games, situating each of these 'innovations' within a "*system* of global ownership, privatized property, coercive class relations, military operations, and radical struggle" (p. xxix, original italics). Because VR is also connected to Harvard's history, this 'system' also includes gendered and racialized relations.

At Harvard in the 1960s, Sutherland and his students were well positioned by a long history of institutional discrimination to apply their skill and dedication. Given Harvard's patriarchal origin as an all-male, all-white college, the first African American professor would not have tenure until the year after the 1968 paper on the headset was published (Aspelund and Bernhard, 2015). At the time of Sutherland's work, women were rarely appointed as professors, and were admitted to the college at a ratio of one woman for every four men (Silverberg, 2006). Amid the settler colonialist language of VR 'pioneers,' it is also significant that the first Native American professor to have tenure at Harvard was in early 2018 (Radsken, 2018). Today's VR 'pioneers' are characterized as "smart people working hard on the right problems at the right

[11] It had recently been revealed that, in a Cold War effort, the CIA had been secretly funding and spying through a student organization called the National Student Association for over a decade (see e.g., Menaud, 2015).

time" (Abrash, 2016, 31:19). At Harvard in the 1960s, 'smart' people were the predominantly white men admitted to the school at that time, and the 'right' problems were technologies with military applications, operating within a logic of corporate and political expansion. This political context, including the gendered and racial norms of Sutherland's time—or, for that matter, their ongoing effects—are not typically discussed in histories that adopt Sutherland's display as a beginning of VR, yet this beginning also offers ways to better understand how the differential power dynamics of VR production and adoption are ignored. Quite simply, Harvard in the 1960s created particular opportunities for Sutherland and his students, while foreclosing those same possibilities for others.

A closer look reveals further omissions. Although Sutherland's head-mounted display is referred to as the 'Sword of Damocles,' it is more accurately the name that Sutherland and his students gave to the headset's ceiling-mounted head position sensor, which looked like a long pole above the user's head (Sutherland, 2017). The paper from 1968 does not mention the name, and it is unclear whether the name was used 'jokingly' (Computer History Museum, n.d.) or 'affectionately' (Burton, n.d.). Not only is the pedigree of the naming difficult to trace, but one of the motivating examples for the research is improperly cited by later work. Sutherland (2017) describes how he became interested in virtual displays after hearing about experiments in which a participant watches a head-mounted video feed of two people playing catch, associating their physical location with the view presented by the camera. The National Research Council (1999) incorrectly cites this anecdote as from Sutherland's 1968 paper, rather than his recollection at a 1996 talk (Sutherland, 2017), a mistake that is repeated in Carlson's (2003) *History of Computer*

Graphics and Animation.[12] These examples indicate that while some details are important others are not—what remains salient in this narrative is a story of a singular innovator, whose 'leap of faith' (Sutherland, 2017) led to the invention of a medium. What this ahistorical account achieves is an apolitical beginning; what remains is prepackaged and repeatable mythmaking.

Despite these murky origins, or perhaps because of them, the 'Sword of Damocles' is now understood to be the name of Sutherland's headset within academic research (e.g., Baus and Bouchard, 2014; Mandal, 2013; Van Krevelen and Poelman, 2010). The lack of critical reflection about these origins or the naming of this device suggests an eagerness to find a beginning; the details are made irrelevant. Consider the following excerpt from the recent book, *Defying Reality: The Inside Story of the Virtual Reality Revolution,* by David Ewalt (2018):

> And because all this gear made the headset unbearably heavy, it was suspended on wires from a rig attached to the ceiling—a setup that earned it the nickname the 'Sword of Damocles,' after the legendary weapon that dangled precariously over a Sicilian king's throne. (Chapter 2, para. 21)

This is all that Ewalt says of the story of Damocles. Yet despite the almost certain offhandedness of its naming, or the inattentive promotion of the name, there are apt lessons in the story that are relevant to contemporary VR.

Damocles, flattering King Dionysius, praises his happiness, his wealth, and the luxury of his position. King Dionysius asks Damocles if he would like to experience his happiness and

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[12] Carlson, somewhat ironically given these circumstances, opens his book with a quotation attributed to Napoleon Bonaparte: "History is the version of past events that people have decided to agree upon." For the pedigree of *that* quote, Garson O'Toole, the Quote Investigator, offers a fun place to start: https://quoteinvestigator.com/2016/07/05/fable/

Damocles readily accepts. Damocles is given a bed of gold, 'handsome' youths to serve him, ointments and perfumes, and tables of food (Cicero, 1877/45 BCE). Then Dionysius suspends a sword over Damocles's head, hanging it with a single horse hair: there is an ever-present danger in his power. Cicero's telling of the story, addressed to his friend Brutus,[13] is on the subject of happiness: 'Whether Virtue Alone be Sufficient for a Happy Life.' According to Cicero, Dionysius was a tyrant who gained power at 25 and ruled for almost four decades; he ruled in fear for his own life, suspecting everyone, from friends and lovers to daughters and wives. Dionysius has wealth and power, but after so many acts driven by his fear he is incapable of happiness. Damocles is granted the experience of Dionysius's wealth and power and is happy for a moment, but after the sword is raised, he asks to return to his former position. For, "now he had no desire to be happy" (p. 186).

Referencing this story, the name of Sutherland's display inadvertently offers a parallel for contemporary VR. Dionysius creates a virtual world for Damocles that reproduces a cruel simulation of the power and the danger that he feels. The threat that Dionysius perceived becomes real, even if it was once imagined; the 'happiness' that Damocles praised becomes false when the threat that Dionysius feels is made visible. The discourse promoting contemporary VR obfuscates the ramifications of its power. These 'new' technologies are flattered, made to seem luxurious and welcoming despite the sword. Yet the power is there, the danger is there. VR today is an image of Damocles framed to exclude the sword.

Even Damocles, for a moment, was happy.

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[13] For additional context, a year after Cicero wrote *Tusculan Disputations*, Brutus would be among the conspirators who would assassinate Julius Caesar, who had named himself dictator in perpetuity. Cicero did not know of the plan, but was sympathetic to the conspirators, and as a result was killed a year after Caesar's death.

Conclusion: Reframing the future

The discursive frames outlined in this chapter—of pioneers, of preconstructed histories, of 'diversity'—suggest that those who lead contemporary technological development, who establish a common identity, as well as those who heed these calls, all support the same structures that have already been in place for decades. For Wajcman (2010), technologies (re)make culture while culture (re)makes technologies: "technological change is a contingent and heterogeneous process in which technology and society are mutually constituted" (p. 149). In this sense, the promotion of VR both reflects and extends exclusionary sociopolitical arrangements. Each of the frames in this chapter are embedded within the larger frame of newness. There are new frontiers for these pioneers, new rules to be written, new histories and futures to be crafted, new possibilities for 'everyone' to participate. When VR is framed as an advent of exciting technological change, old ideas are made to seem new. VR becomes a reiteration of the norm.

As an overarching frame, the sense of newness is seductive in part because it heralds opportunity, whether the motivation is technological or social. In the *Guardian* article I quoted above, Arwa Mahdawi (2016) writes, "Because VR is in its infancy, it's still a fairly flat playing field when it comes to who is equipped to break into it. We've got a chance to fix that pipeline from its start" (para. 15). Similarly, in a document advocating for women in the VR community, advocating against the broader harassment and discrimination of the tech sector, its authors wrote: "What is different is that [VR is] a much newer form of media. It is setting off on the early stages of its journey; a journey where it will find its place in society" (Allen et al., 2017, p. 2). This newness is said to provide a 'golden opportunity.' While such efforts are necessary, strategic, and counterhegemonic, what if VR is not new? What if it is not 'in its infancy' or

'setting off on the early stages of its journey,' but instead yet another expression of masculine, exclusionary promise?

As corporations place the burden of diversity work on those who are already marginalized and disenfranchised within the tech sector, industry leaders frame a default support of hegemonic norms by promoting a colonial desire to participate in a technologically expansionist 'future.' The discourse around the beginnings and possible futures of VR expresses an effort to legitimize and normalize VR while obscuring the more urgent factors of its immediate adoption. Emphasizing newness can stifle questions around what has purportedly changed, and what still needs to change. To set the parameters of how the medium is framed, including who participates and how, is to set parameters of control. As industry leaders dictate the terms of this 'evolutionary' process, the (r)evolution is premised on the notion that a particular kind of change—new technologies—is all that is necessary. The notion of 'evolution' naturalizes, mobilizing future-oriented notions of 'progress,' and the notion of 'revolution' socializes, mobilizing the people and structures that are already in place. Both reaffirm the status quo, and reaffirm the imagined inevitability of VR.

This chapter concludes with a possible response to this framing, contextualizing one history and the technological object that made it famous, the Sword of Damocles. A trope of Oculus advertisements is the upturned face of someone wearing a headset. We do not see what these people see. Mouth open, it is as if these people (typically men) see something awe-inspiring, something profound. Whatever it is, it is hidden behind the veil of the headset. Improperly framed, there is a seductive power to these images: people are apparently drawn in, immersed in another world to better see our own, seeing newness and change and futures that are whatever the viewer might imagine them to be. Richard Westall's painting of The Sword of

Damocles also shows Damocles looking up at apparent possibility. His mouth is also slightly agape. His eyes also show a profound realization. Zoom in on Damocles's face—hide his eyes, hide what he sees—and there is a ready, open-mouthed parallel to all the advertisements of people in headsets, looking up in apparent awe. Improperly framed, all the context is lost, all the people are gone, all their sneering and indifferent and smiling faces. But reframed, the sword is there, the power is there, just as it was.

Chapter 4 - Palmer Luckey and the Rise of Contemporary Virtual Reality

> "The matrix has its roots in primitive arcade games," said the voice-over, "in early graphics programs and military experimentation with cranial jacks."
>
> —William Gibson*, Neuromancer*

Introduction

In 2012, the prospect of mass-market consumer virtual reality (VR) was laughable. When Sony released the HMZ-T1 Personal 3D Viewer for $800 (USD), a headset advertised as the "ultimate cinematic experience" (Sony, n.d.), the tech review team on *Attack of the Show!* (Pereira and Mira, 2012) joked and laughed throughout their review, saying that even though it was "the world's most advanced headset" (01:01), it had "adjustable straps that … feel like you got a free hat at a gas station" (01:30). Game developer and VR enthusiast John Carmack is reported to have said that it was like "looking through toilet paper tubes" (Onyett, 2012, para. 7). A review on CNET stated, "The headset weighs almost a pound at 14.8 oz, which Sony describes as 'surprisingly lightweight.' If you're expecting a deep-sea diving helmet, then, yes, it is surprising" (Pendlebury, 2012, para. 7). It was not just consumer VR; people had been laughing at VR research as well. In a 2017 talk, Mel Slater, perhaps one of the most prolific VR researchers, noted that for "years and years… people would actually laugh" (Slater, 2017, 06:59) when he said that he was a professor of virtual reality. Yet as early as 2014, Google was employing what would become a tagline for their VR strategy: 'VR for everyone' (Lee, 2014). That same year, Facebook founder and CEO Mark Zuckerberg bought Oculus VR for over $2 billion (USD). VR had apparently become a corporate imperative.

One year after the Facebook acquisition, Oculus founder Palmer Luckey was featured on the cover of *Time Magazine* with a headline that declared that virtual reality was 'about to

change the world' (Stein, 2015). Despite this sense of immanence and hype, and despite decades of depictions in popular media, few people had actually tried VR. For VR to enter the mainstream, it would require, at the very least, an initial audience. Palmer Luckey represented this audience, both as a gamer offering what was said to be 'a niche product for gamers' (Stein, 2015) and as a young, white, male, able-bodied, middle-class VR enthusiast promoting technologically-mediated transformation (Golding, 2019). Analyzing Luckey's pose on the cover of *Time Magazine,* Daniel Golding writes, "We are being asked to imagine ourselves replacing Luckey as the creator-cum-subject of this new media form: Luckey's body is the idealized stand-in for our own" (Golding, 2019, p. 347). The promotion of Palmer Luckey became the promotion of VR. As both idealized audience and idealized entrepreneur, Luckey's promotion in his early career presents repetitions of two stereotypes: the white, male gamer and the white, male innovator.

In this chapter, I present a case of Palmer Luckey to examine how his promotion and participation in VR discourse perpetuates an exclusionary status quo. I begin by outlining a connection between videogames and VR. For prospective VR developers and enthusiasts, Luckey contributes to a framing of VR as technological progress and the next step in gaming, which simultaneously serves to recruit an audience and legitimize their pursuit. In the second section, I argue that Luckey's desire for VR innovation and gaming must also be considered within the overlapping context of the misogynistic gamergate movement, which is also to say that it can be understood as a desire for the expansion of a male-dominated industry rather than a desire for progressive change. The third section details some of the ramifications of this audience building, as exemplified by Luckey's right-wing connections, his financial support of their causes, and his proposals for their future. Here, too, Palmer Luckey represents a particular kind

of gamer whose entitled and fearful politics echo both pop culture and gamergate. From his founding of Oculus in 2012 to his dismissal at Facebook in 2017, Palmer Luckey and the media reports that surrounded him contributed to a framing of VR as the solution to a problem in video games, a narrative of technological progress that prioritized its own development. This narrative had the support of industry leaders, as well as support from company statements, news articles, and hopeful gamers. Throughout this period, the power and politics that Palmer Luckey represents move from implicit to explicit. As his attention moves from videogames to nationalism and United States defence contracts, I argue that Palmer Luckey's promotion under the banner of 'progress' serves to reify white, male systems of power that are both established and contested within cultures of technological development.

'Stuck in a rut': VR as Videogame Progress

There are familiar tropes in Luckey's 'rags-to-riches' story: an eccentric teenager with a relatively obscure hobby; a beginning in a garage before becoming worth billions of dollars, just like Google, Apple, Amazon, etc. (Hendricks, 2014); a techno-futuristic optimism about a 'revolutionary' technology; and a general mythmaking around its innovator, the single 'face' of a technology company, like Steve Jobs, Mark Zuckerberg, Jeff Bezos, or Elon Musk. As technology writer Robert Purchese (2013) puts it:

> In the space of four short years, Palmer Luckey has gone from being a regular Joe in his parents' garage, tinkering with head-mounted displays, to being the head of a 30-person team and the face of virtual reality in gaming. (para. 39)

In an industry already overrepresented by white men, yet another would walk this same paved road of success. Just as these tropes helped to validate Luckey's early achievements, Luckey and his promotion in the media helped to frame a particular vision of VR. As Golding (2019)

observes, Luckey was constructed as the embodied normalization of VR: a 'proto-audience' who represented the idealized characteristics of prospective developers and consumers. For Luckey, at least initially, it was all about games.

In his 2012 Oculus Kickstarter video, Palmer Luckey is superimposed on a still image of someone apparently working on a VR headset. Luckey says:

> Games are something I'm really passionate about, and even more than playing games I'm passionate about bringing games to the next level. What we're doing at Oculus is trying to create the world's best virtual reality headset designed very specifically for gaming. (Kickstarter, 2012, 00:19)

At SIGGRAPH that same year, the Conference and Exhibition on Computer Graphics and Interactive Techniques, a program called ElectricTV (2012) interviewed Luckey, then 19 years old. At this time, with 23 days left in the Kickstarter, six thousand backers had already pledged nearly $1.5 million (USD) to Luckey's Oculus VR campaign.[14] The interviewer asks him whether Oculus VR is for gaming alone, or whether it could be used for other applications. Luckey is keen to list other possibilities for VR, including simulations for medicine, the military, and for education, and there are echoes of the same list of possibilities two years later when Luckey is featured at the Forbes Under 30 Summit (Forbes Live, 2014). But Luckey notes that those applications will come later. "We're just focusing on gaming right now," Luckey says. "If developers want to take that and do other things with it that's fantastic, but gaming is the focus" (ElectricTV, 2012, 02:14). It was an appropriate initial audience for Oculus: Luckey himself was a gamer who wanted to play games in VR (Stein, 2015). Yet the first Oculus headsets were a

[14] The Kickstarter campaign would go on to raise over $2.4 million (USD) pledged by over 9,000 backers.

novelty that might have amounted to very little. Luckey's ambitions would also need the validation of a wider community to gain traction.

Interest accumulated with support from prominent developers like John Carmack and Michael Abrash (Kickstarter, 2012), both of whom would later work for Oculus VR. Carmack used his renown and ingenuity to acquire and modify one of Luckey's early prototypes, creating a VR demo of one of his own games, *Doom 3 BFG Edition*, for the Electronic Entertainment Expo (E3) in 2012 (Purchese, 2013; Schlichting, 2012). VR was one of Carmack's pastimes. Building rockets was another. In his idiosyncratic way, Carmack recounted his experience trying an available head-mounted display, but it was "just as bad as I had remembered it from all the different versions that I had tried" (Schlichting, 2012, 00:35) After taking it apart, reworking the code, and using the "fiberoptic gyros for our rockets," (02:00) things started to get better. According to Carmack, the problem was that there are too many ways that its technologies can fail, a 'chain' consisting of "sensors and communications and simulation and rendering output and display and optics" (01:15). The benefit of Luckey's work, Carmack said, was the relatively inexpensive lenses and display, to which Carmack "added my sensors and the strap and the software and stuff" (06:03) This 'stuff' was secured to Luckey's prototype with duct tape and electric tape. Charles Onyett (2012) at IGN called it "an ugly wad of electronics attached to an elastic ski goggle band." And yet, as Onyett reports, there was a payoff: "[a]fter the initial disorientation and dizziness, I was entirely immersed in the world" (para. 1). With a sense of 'immersion' positioned as something worth the cost of discomfort, a lot could be forgiven: with Carmack's endorsement, playing a repurposed game through an 'ugly wad of electronics' became a hopeful vision of the future.

According to Luckey, the endorsement of prominent members of the games industry was a crucial catalyst: “It went from being maybe 40 or 50 people who were interested in the Kickstarter,” Luckey says, “to … all of a sudden there were thousands of people who were very interested” (quoted in Purchese, 2013, para. 20). When Facebook acquired Oculus in 2014, the framing of VR as a gaming technology was already strong enough that reportedly ‘hundreds of game developers’ voiced their concerns on Twitter on the day of the acquisition (Stuart, 2014b). Appeasing the negative sentiments of gamers and game developers was important. In separate posts on the same day, Mark Zuckerberg, Oculus, and Palmer Luckey each offered assurances that this would be good for games, good for VR, and that the inevitable ‘future’ of VR was something that ‘we’ can participate in creating (Luckey, 2014; Oculus, 2014b, Zuckerberg, 2014b). The similarities across these posts suggests some degree of coordination; while it is unclear who managed these responses, Luckey appears to have had a specific role in aligning a gaming audience with this broader narrative of an inevitable VR future. While each post addressed games, Luckey represented gamers, calling himself a ‘proud member of this community,’ weaving games and gaming throughout the post. “This is a special moment for the gaming industry,” Luckey (2014) wrote. “Oculus’ somewhat unpredictable future just became crystal clear: virtual reality is coming, and it’s going to change the way we play games forever” (para. 6). In each post, VR was still framed as a technology that would solve the problems of games; the challenge, apparently, was to also cast VR in the way that Zuckerberg (2014) saw it: as ‘a new communication platform.’

For their part, Oculus (2014b) offered the somewhat patronizing assertion that, “At first glance, it might not seem obvious,” but when supporters “consider it more carefully,” they would find that Oculus and Facebook are “culturally aligned with a focus on innovating and hiring the

best and brightest" (para. 5). After offering Facebook-themed tropes of a more 'open' and 'connected' world, Oculus concluded by addressing what this means for games: "This partnership ensures that the Oculus platform is coming, and that it's going to change gaming forever [¶] We'll see you in the Metaverse!" (para. 7-8). Zuckerberg's (2014) post on Facebook also promised that games would not be left behind. "Immersive gaming will be the first [to offer new kinds of experiences], and Oculus already has big plans here that won't be changing and we hope to accelerate" (para. 5). In a Reddit post, Luckey (2014) opened by aligning himself with the videogame community. "I've always loved games … My foray into virtual reality was driven by a desire to enhance my gaming experience" (para. 1). Like the Oculus (2014) blog post asking its readers to 'consider it more carefully,' Luckey (2014) asserts that he too was initially 'skeptical' of VR before changing his mind; he only needed to hear about Facebook's 'vision' from Zuckerberg, associating the vision with the man rather than the company as if to humanize the 'partnership': "As I learned more about the company and its vision and spoke with Mark, the partnership not only made sense, but became the clear and obvious path to delivering virtual reality to everyone" (para. 2). VR had become a technology for 'everyone,' not just gamers.

Yet even after the release of a prototype headset in 2013 and another in 2014, relatively few people had tried VR. Tech news outlets provided a valuable resource: an idealized response to a first experience. When Oculus introduced the Crescent Bay prototype, reviews were enthusiastic: "Oculus' Mind-Blowing New Prototype is a Huge Step Toward Consumer VR," reads a headline at *Wired* (Rubin, 2014). On the VR news website *Road to VR*, co-founder Paul James refers to one moment in his ten minutes of demos as "fucking cool. And I think that's the first time I've written that word on this site" (James, 2014, para. 14). Less than a year later, demos of the Crescent Bay prototype were shown at the International Consumer Electronics

Show (CES). Headlines at the time again showed strong enthusiasm. At *Tech Crunch,* for example: "The Oculus Rift Crescent Bay Truly Transports You" (Etherington, 2015). VR website *Upload VR* declared, "Oculus shows off the Crescent Bay at CES 2015, and it's better than you can imagine" (Mason, 2015). In the latter article, Will Mason,[15] co-founder of VR news website *Upload VR*, writes, "By the end of the last demo, my cheeks hurt because I had been smiling so much in amazement and joy from the experience" (para. 10). The sense of transportation, long-awaited joy, and eager excitement in these articles is more than a validation of VR. In some cases, it also demonstrates a mutually beneficial relationship.

Websites like *Road to VR* and *Upload VR* reveal a financial interest in the promotion of VR and VR news, mobilizing industry-led discourse with a shared language that helps to launder the industry's ideological conceits. According to their website, *Road to VR* is "charting the course between today's immersive technology and that of the distant future, capable of perfect simulations of reality" (Road to VR, n.d., para. 1). In other words, their 'road' inevitably leads to 'perfect' VR, necessarily requiring its technological development. As for *Upload VR*, support of VR is written into their 'manifesto': "We exist to accelerate the success of the consumer virtual reality industry" (Upload VR, n.d., para. 1).[16] The *Upload VR* 'manifesto' employs tropes I describe in Chapter 3, including frames of 'newness,' of a 'wild west,' and of the possibility for 'everyone' to participate in an imminent 'technological revolution.' Once established, the promotional discourse could be adopted by any other VR company, any VR enthusiast, or any report on VR. At *TechCrunch,* for example: "Using [the Oculus Crescent Bay Prototype] feels

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[15] This is the same Will Mason who, along with his co-founder Taylor Freeman, would later be named in the sexual harassment lawsuit that I discussed in the previous chapter. Just as the lawsuit is an example of how the culture of early consumer VR creates the conditions for who or what is welcome, Mason's 400 articles between 2014 and 2016 offer several examples of what kinds of reactions to VR are welcome and expected.

[16] This is no longer on the website. The portions I refer to here can still be found in Conner (2017).

like an almost religious experience all over again, to echo a claim many made about even the original Rift prototype. It's hard to explain to anyone who hasn't tried it" (Etherington, 2015, para. 3). This is, again, the language of belief: any experience with the technology was said to prove its future potential.

As the audience and expectations for VR grew, Luckey would continue to frame a narrative around games and notions of technological progress. In 2015, Luckey was featured on the cover of *Time Magazine*, barefoot and floating blissfully above a virtual beach, the cord of his headset dangling off-frame. An exuberant quote attributed to Luckey is repeated throughout the article as Luckey's original motivation for (a very specific kind of) gaming in VR: "I want to feel like I'm really running down halls shooting bad guys!" (Stein, 2015, para. 3). At the Game Developers Conference (GDC), Luckey (2016a) asserted that the games industry needed the technological development of VR:

> I feel like, for a long time, games were in a little bit of a rut. I don't say this is a game developer. Remember, I'm a really young guy. This is just as a gamer, I felt like things were really stuck in a rut. (3:19)

As 'a really young guy' and a 'gamer,' Luckey was speaking from the perspective of an audience member, yet his proposed solution to this 'rut' was not better games, not better content, not better social or working conditions. His solution was VR. A year later, recorded outside one of the auditoriums at Oculus Connect 4, Luckey would repeat his critique: "The game industry, I think, was kind of running into this rut where it was kind of topped out and it wasn't really going to be able to, like, significantly progress, technologically at least" (Upload VR, 2017, 00:31). By then, however, Luckey's stint at Facebook, and by extension at Oculus, the company he had co-founded, had come to an end.

Still wearing the teal Hawaiian shirt he so often wears (flip flops are another noted part of this relaxed image [Purchese, 2013; Levy, 2018]), Luckey is surrounded by a receptive throng at Oculus Connect 4 (Upload VR, 2017). He is still smiling, still declaiming a future of VR, and not commenting on his departure from Facebook. But, for Luckey, VR had finally become something bigger than games. There was big money at play. Interested parties were investing "many, many, many billions of dollars (…) because they want VR, not 'cause they care about games, but because they care about VR" (Upload VR, 2017, 00:48). Even before the possibility of these billions of dollars, it should have been clear that VR was about more than just games. But it was games and gaming that helped to define an audience that Luckey represented. Luckey's statements and the ways that he was represented in the media appeared to envision an audience who would believe VR discourse that called for technological progress, change, and revolution. This call for change, however, would neglect the most regressive aspects of games culture.

'Nothing has been done': Gamergate and the Failure of the Institution

The year of the Facebook acquisition was the same year as the gamergate hashtag, a stark reminder of the broader cultures and contexts that VR was meant to enhance. Supporters of the hashtag claimed that the movement was about ethics in games journalism, but as the content of the tweets and emails under its banner indicate, it was a movement of misogyny and harassment against women in games (Woffard, 2014). This was the cultural context of games—a backdrop to VR hype that promised a 'revolution' that would 'change gaming forever' (e.g., Kickstarter, 2012). Gamergate was an attempt to police the boundaries of the bounded play space, a reaction "against women speaking in public" (Jenson and de Castell, p. 189). For developers and critics like Zoë Quinn, Anita Sarkeesian, Leigh Alexander, Brianna Wu, and others, gamergate included

threats of sexual and physical violence, including bomb threats and threats of rape and death (Chess and Shaw, 2015, 2016; Nieborg and Foxman, 2018). In some cases, harassment victims were doxed—their personal information stolen and published on the internet—which came with further threats of violence (Quinn, 2017; Wu, 2015). The harassment that targeted Sarkeesian in 2012 (O'Leary, 2012) showed that the sentiment that drove gamergate preceded the hashtag; gamergate gave it a name.

When gamergate exposed the systemic sexism that governs not just videogames but the cultures and contexts in which videogames exist (Cross, 2014), it also revealed how the broader culture and institutions failed to reckon with the severity of the harassment. Zoë Quinn, whose experience of domestic abuse sparked the gamergate hashtag, described the failure of law enforcement to respond to online crimes, detailing the police's reluctance and/or inability to address online harassment that crossed state borders, as well as the labour involved in amassing the evidence of one's own threats (Quinn, 2017). Brianna Wu, who contacted the media, the police and the FBI after being doxed and threatened, contended that in addition to a lack of representation in the technology sector of those who were targeted with abuse, there was also a lack of reporting from games outlets and a lack of legislation to make it possible to track down the culprits (Stuart, 2014a). In an article describing her experience, Wu (2015) critiqued this lack of response from law enforcement, writing that she had received over a hundred death threats, repeating a phrase throughout her article: "terrifyingly, nothing has been done" (e.g., para. 5). This phrase continues to be emblematic of the ongoing failure to adequately respond to online misogyny.

Two years later it would be revealed that in Wu's case, although the FBI identified at least four suspects and obtained video confessions from two, neither was prosecuted (Edwards,

2017). In one confession, a suspect claimed that the victim of his own threats was a "professional victim who exaggerated the threats" (quoted in Edwards 2017, para. 3). This was one of the tactics of gamergate supporters: to attempt to discredit victims by declaring that they were part of a 'false flag' operation (i.e., a military term for a deceptive attack) perpetrated by Social Justice Warriors (an ironic label for 'fake feminists' who are supposedly raising awareness of social justice issues for personal gain [Ringo, 2014]). Jim Edwards (2017) at *Business Insider* reported that according to the FBI files, when one suspect was shown incriminating documents, he admitted to his crime and acknowledged that he knew it was a crime. Then the suspect seems to have offered a repentant, childlike assurance: "The man 'understood that it was a federal crime to send a threatening communication to anyone and will never do it again,'" (as quoted in Edwards, 2017, para. 4). For Edwards, the subpoenas, the identification of suspects, and the cooperation of companies like Google, Microsoft and Twitter implied that, "This was taken seriously by the FBI, even if nothing ultimately came of it" (para. 61). The case was dropped; no charges were laid.

While gamergate was part of games discourse in 2014 and 2015, any link to VR was conspicuously absent. The possibility that VR might offer a solution to systemic barriers in the technology industry was dismissed in the early days of contemporary VR. At the first Oculus Connect conference in September 2014 (a month after the gamergate hashtag began) a panel discussion featuring the core Oculus team, Michael Abrash, Atman Binstock, John Carmack, Palmer Luckey, and Nate Mitchell ended with questions from the audience. Amid questions from white men to a panel of white men (with questions primarily about content and technical implementation), M Eifler of EleVR asked, "What is Oculus's approach to their clear gender gap, and how you're gonna *not* port that into VR?" (Menovitch, 2014, 42:24). The question

received some sparse applause, and Luckey offered a response. “So, I will address this carefully,” he began, smiling. Nate Mitchell laughed. Luckey continued:

> I noted that there were some people online, even an article pointing out that Oculus Connect is mostly male. I will point out that in the selection process there were very few women that applied. It was not that we selected for males and in fact women may have actually come out ahead in the selection process by a very slight margin. Um, I’m not a hundred percent sure what we can do, you know it’s, this isn’t a problem with VR, this is something that is widespread in the tech industry, and I don’t think that virtual reality has any innate quality that really makes it immediately obvious that we’re going to be the thing that has a lot more, you know, women becoming interested in virtual reality and coming to developer conferences or becoming game developers. Then again, I’m not an expert on this issue. I don’t really actually know what the best way to solve it, it’s not something I’m, it’s not something that I’m, I’m equipped to do. (Palmer Luckey, in Menovitch, 2014, 42:35)

Luckey’s answer contains an awareness of the larger issue of discrimination facing the tech industry, as well as an awareness that such issues affect Oculus. Where that awareness falls short is in his inability to see how Oculus perpetuates the discrimination within technology companies by assuming it is a matter of individual ‘interest’ rather than a matter of systemic, structural barriers. As such, this provides a recent example of what has been documented in decades-old research on gender and information technology, in which women are alternately blamed for their perceived lack of interest in tech or portrayed as victims of socializing forces (Abbiss, 2009). In this case, an awareness of a larger structural problem in Luckey’s answer is used to shift blame from Oculus to something beyond his (and their) control. Carmack’s

response is noticeably succinct, and it receives applause. He states, “We are having a hard time hiring all the people that we want. It doesn’t matter what they look like” (John Carmack, in Menovitch, 2014, 43:33). The brevity of this response is notably disproportionate to his discussions of graphics and optimization. His uninterrupted response to the very next question, about using VR as an everyday computer, is over 380 words. Juxtaposing these responses shows—temporally, affectively, and intellectually—how one topic is closed and the other is open.

It takes about a minute and a half for the question and the two answers. As the video (Menovitch, 2014) is available on YouTube, comments can be sorted as ‘newest first’ or as ‘top comments.’ The comments are predominantly sexist, and converge on that two-minute section of the hour-long video. Sorting by ‘top comments’ shows a post by ‘Barnivere,’ in 2015, up-voted 113 times and not at all downvoted:

> That smug look on her face after she asked her question, made me want to slap her. You just don’t HIRE women into the industry, these “interested women” think they could just throw in an app and BAM! hired, it just doesn’t WORK that way, you have to have some kind of experience and skills under your belt, it’s not a form of sexism or misogyny. If these very people crying their eyes out about “BAAAAAAW NOT ENOUGH WOMEN IN THE INDUSTRY” took the time to actually LEARN the necessary credentials to get into it, they might just GASP change things and this “Gap” they speak of! NOTHING is stopping these women from trying to get qualified in order to break INTO the industry. PS: She’s a fucking hypocrite, she works in VR yet she’s complaining that OR [sic] is mostly male when her team consists of MOSTLY WOMEN: http://elevr.com/about-us/

The violence and pained vitriol in the comment strongly outweighs the brevity of Eifler's question, suggesting that the question resonates with discourse beyond the panel discussion. Like the responses from Luckey and Carmack, the comment reflects an assumption that it is up to individual women, rather than the collective effort of companies, to proactively address decades of discrimination within the tech industry.

The question may have also generated such rebuke because it interrupted the discussion of what was discursively framed as more important: the technology and its implementation. Eifler's question is the only mention of gender within the hour-long panel. The comment targets women generally, and Eifler personally. That Eifler is identified within Barnivere's comment is especially significant. In an interview for the Techies Project (2016), which profiled people who are marginalized within the tech industry, Eifler reflects on their experience at the panel and what came after:

> My team and I went to the first Oculus Connect, and there was an open panel, and it was being live streamed on the internet. And they were like, "Anyone could come up and ask a question." And there was 1% women at this conference and very few people of color and there were no female speakers and I was mad. So I went up and asked how they planned to prevent the clear race and gender biases of their conference and the industry as a whole from doing to VR what sexism and racism has done to video games.
>
> And they answered it really poorly. It was so lame.[17] But since I am female and it was live streamed that question turned into doxing, and death threats on 4chan and Reddit.

[17] Eifler's use of an ableist descriptor should also be a reminder that disability is not part of this discourse. Although Eifler also identifies as 'disabled, non-binary, and queer' (http://www.blinkpopshift.com/aboutme), Eifler appears to be targeted because they are identified as female.

> We had to get our corporate security officer to intervene. It was scary. I hadn't expected such an infantile response. I felt so naive. I'm still super naive, because I still assume that everyone wants everyone to be equal. Also, people who do death threats are so uncreative. I felt like they were just copy and pasting from Anita Sarkeesian's death threats. (para. 34-35)

While Eifler's question at Oculus Connect did not address race, the response to their question is revealing of the culture of games and this generation's consumer VR, as well as how social capital within this space is constructed and maintained. The culture that Eifler questioned was well established. Eifler and the team at EleVR were early adopters, but not the early adopters that the VR and games communities were willing to welcome. If 'gamer capital' is white, masculine, and fervently protected, it requires the nuance of intersectionality to better understand how particular groups face discrimination within these bounds (Nakamura, 2012). Questions and critiques like Eifler's challenged the status quo, and clarified that the dream of VR was the dream of a predominantly white, male-dominated culture.

Despite its absence from VR discourse, gamergate is a relevant backdrop to the contemporary adoption of VR because the dominant games and cultures that its supporters venerated are ostensibly those that VR was meant to solidify, even as they called for change. As Foxman (2018) describes, in a period in which the values within games and gamer culture were challenged, "VR represent[ed] an avenue and medium for the tenets and technologies of games and gaming to be reimagined and redeemed" (p. 114). And yet, especially in its first few years, there was no expectation that the social and cultural conditions of games or VR would also require change. In 2014, the International Game Developers Association reported that 76% of

game developers were men, 22% women, 2% 'transgender/androgynous/other'[18] (IGDA, 2015). By 2017, these numbers were largely the same, suggesting an entrenched culture of discrimination. According to the IGDA, "Developers are still young, male, white and most of them do not have children or elder care responsibilities" (IGDA, 2018, p. 32). Even though a majority of respondents claimed to value diversity (79% in 2014, and a record 81% in 2017),[19] the statistics do not reflect these purported sentiments. Among the 'significant challenges' in the report is the "continued underrepresentation of women, ethnic minorities and older workers and the associated challenges of equity and discrimination" (IGDA, 2018, p. 34). For gamers and VR enthusiasts, VR was an implicit opportunity to transfer the discrimination of the dominant culture of games and the tech industry onto yet another platform, while also proclaiming that this time it would be for 'everyone.'

'From Plowshares to Swords': Making Implicit Politics Explicit

Over the course of gamergate coverage, a process of 'mainstreaming' took place: as gamergate began to represent wider evidence of mediated misogyny, there was also the visible institutionalization of misogyny in U.S. politics with the election of Donald Trump and support from 'alt-right' outlet *Breitbart* (Nieborg and Foxman, 2018). If the politics of gamergate supporters were previously implicit, the alt-right offered rhetoric that would make their politics explicit, aligning antifeminism with white nationalist discourse. Early characterizations of gamergate as a 'debate' precipitated by a 'small, vocal minority' (e.g., Dewey, 2014) missed the point. It was not a debate, because its supporters issued abuse rather than arguments; it was not

[18] This conflating of marginalized identities demonstrates not only a general lack of diverse representation, but also how identities can be further 'othered' by a lack of specificity and a lack of clear accounting.

[19] Ironically, in 2017, 42% felt that the games industry had become more diverse in the previous two years, even though it had not significantly improved (IGDA, 2018).

from a vocal minority, because as the IGDA (2015) statistics suggest, their abuse came from a position of hegemonic majority. Jim Edwards at *Business Insider* called it 'bizarre' and 'baffling' for "anyone who is not a hardcore video gamer" (Edwards, 2014, para. 1). This too missed the point. It would be baffling to assume that sexism is specific to, or only understandable to, those who play video games. This final section documents some of the explicitly political contexts of gamergate in relation to Luckey and the presumed audience for VR, showing how the discourse of a young, outspoken white man transitioned from the subject of games and VR to the subject of nationalism and military technologies. As Lisa Nakamura (2019b) argues, it is necessary to examine the links between white digital media culture and "far-right-wing organizing, media distribution, and production" (p. 20). As gamergate expanded its scope with far-right political fervour, so did Palmer Luckey. The mainstreaming of gamergate politics coincided with the mainstreaming of Luckey's politics.

Under the banner of alt-right outlet *Breitbart*, two key aspects of gamergate appeared to draw the attention of Milo Yiannopoulos, who was just beginning his controversial role there: attacks on 'feminists' (i.e., an attack on those who fail to uphold 'traditional' values), and attacks on 'mainstream' news (i.e., an attack on any media that does not serve the right). Writing for *Breitbart*, Milo Yiannopoulos pivoted from attacking gamers in May of 2014 to adopting the anti-feminist rhetoric of gamergate in September (Jilani, 2014). Yiannopoulos did not need to understand games; he needed to understand how to solicit the attention of an audience who felt wronged and threatened by progressivism. These 'marginalised' gamers were winning, Yiannopoulos (2014) wrote, and they were employing 'blisteringly effective tactics' against the 'abuse' of the left. Aligning supporters of gamergate against 'liberal media' and with 'real America' gave gamergate a more explicit political foothold.

These efforts did not go unnoticed. In a column for *The Guardian*, Jon Stone (2014) argued that gamergate and its supporters were garnering dangerous associations. Stone wrote, "Marching under the incredibly vague banner of 'journalistic ethics' allows bona fide neo-nazis to hold hands with ticked-off customers and claim common cause" (Stone, 2014, para. 2). In 2016, a month after Donald Trump was elected president of the United States, Matt Lees wrote a column for *The Guardian* arguing that the co-opting of gamergate by alt-right sources happened in plain sight, and should have been evident as bellwether opportunism under the leadership of figures like Milo Yiannopoulos. Lees argued that Steve Bannon, executive chairman for *Breitbart*, and later Chief Strategist to Donald Trump, used the same techniques for gamergate that he used to foster a sentiment of disenfranchised dissent for the alt-right movement (Lees, 2016). Bannon was recruiting an audience.

This became clearer after emails and other documents leaked to *BuzzFeed News* detailed intentional efforts from Bannon and Yiannopoulos to solicit, recruit, and define a movement of racist, bigoted, sexist, and anti-Semitic voices under the banner of the alt-right (Bernstein, 2017). In his report on these documents, Joseph Bernstein (2017) shows how Yiannopoulos befriended and sought the advice and opinions of neo-Nazis, pushing the boundaries at *Breitbart* with Bannon's encouragement, while *Breitbart* editor Alex Marlow apparently attempted to delimit their racism and anti-Semitism. The documents also suggest that gamergate was a presage to Bannon's efforts to build an alt-right audience. While gamergate provided Yiannopoulos with staff like his ghostwriter, Allum Bokhari, over time their writing reportedly gained a following that included "secret sympathizers in Silicon Valley, Hollywood, academia, suburbia, and everywhere in between" (Bernstein, 2017, para. 9). As Bernstein (2017) argues, the documents

show how effective and how deliberate these tactics were; it was 'an audience expansion machine' that was indifferent to the inclusion of 'white nationalists and neo-Nazis.'

Luckey's connections to these efforts present a longer public and private history with gamergate and the alt-right that was largely ignored throughout Luckey's promotion. According to Ben Collins and Gideon Resnick (2016) at *The Daily Beast*, Palmer Luckey met Yiannopoulos sometime in 2015, and by 2016 became involved with, and hoped to raise money for, a pro-Trump group backed by Yiannopoulos called Nimble America. The group was "founded by two moderators of Reddit's r/The_Donald, which helped popularize Trump-themed white supremacist and anti-Semitic memes[20] along with 4Chan and 8Chan" (Collins and Resnick, 2016, para. 16). Luckey's initial contribution of $10,000 (USD) funded, in part, an anti-Hillary Clinton billboard. The stated strategy of Nimble America had echoes of gamergate and *Breitbart*'s strategy under Bannon: "Shitposting is powerful and meme magic is real" (Collins and Resnick, 2016, para. 4), i.e., inflammatory statements were seen as more powerful than truth. A day after Collins and Resnick broke the news, an article on *Motherboard* detailed Luckey's Twitter likes for pro-Trump and alt-right memes and posts, as well as liking Nicole Edelmann's (Luckey's girlfriend at the time, now his wife) pro-gamergate posts (Maiberg and Bateman, 2016). As Maiberg and Batemen (2016) observe in their *Motherboard* article, Luckey's politics had been evident on Twitter for months. There was nothing secretive about his Twitter likes; Luckey's politics had simply been overlooked amid the hype.

For those who defended Luckey after the Nimble America revelations, it appears that prioritizing inflammatory statements continued to be a tactic. Responding to a report at *Gizmodo*

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[20] Here the article links to: https://www.thedailybeast.com/how-pepe-the-frog-became-a-nazi-trump-supporter-and-alt-right-symbol

that covered much of the same content while further detailing Edelmann's posts (Menegus, 2016), Charlie Nash (2016), one of Yiannopoulos's hires for *Breitbart*, called the article a 'hit piece,' claiming that *Gizmodo* had caused Edelmann to be 'harassed off Twitter.'[21] Blake Harris, who would soon publish a book on Palmer Luckey (characterized as an 'underdog story'), also came to Luckey's defence, calling it an 'assassination' that made it understandable how 'fake news happens' (Harris, 2017). Harris contended that the headlines reporting the Nimble America connection were both hyperbolic and untrue, that Luckey's connections to white supremacists was unclear, and it was not so bad because they only produced one billboard. These arguments are tenuous: Luckey would have or should have known about those he was supporting financially, i.e., people who had histories of popularizing white supremacist views, and their ineptitude in this instance diminishes neither their intentions nor their affiliations. Harris's article appears in April, 2017, eight months after the Nimble America story; remarkably, it does not comment on the more recent revelation about Palmer Luckey's financial contributions.

After his apology on Facebook in September (Luckey, 2016b), Luckey was publicly absent from social media. By March of 2017, Luckey would be dismissed from Facebook, only three years after Facebook's purchase of Oculus. A month later, in April 2017, another story broke, and Luckey returned to Twitter. In early January, Luckey had donated $100,000 (USD) to Trump's inaugural committee, through what *The Washington Post* and other outlets called 'shell companies' named after videogame references (Crecente, 2017; Helderman and Wagner, 2017). Luckey (2017b) called the coverage 'Fake News,' employing the Trump-style 'Sad!' to conclude his Tweet; in an attached screenshot of a Reddit post, Luckey defended his donation and claimed

[21] Edelmann and Luckey appear to have quit social media around the same time. They both started posting again on April 19, 2017.

that, like donations from other corporate entities, it is to "support the process regardless of the winner" (Luckey, 2017b). In the thread of replies, Luckey confronted a Valve employee who called it 'pretty abhorrent' to support a 'bigot' like Trump, regardless of whether or not it is through a 'shell company.' Luckey disputed this assessment calling it 'guilt by association.' Luckey (2017b) wrote, "I don't think someone should be disqualified from being the 'face of a medium' for supporting the President of the US, no matter the party." Like his defence of his Nimble America donation, Luckey appeared to be arguing that his financial support of those who hold problematic views does not mean that he holds or wishes to uphold those same views. Luckey's politics would soon become clearer, but not before being filtered through references to popular culture.

On the day of his return to Twitter, Luckey reposted an image of the anime series *Sword Art Online*, writing, "Nobody can stop me from reposting the same Sword Art Online pictures every year for the next 50 years!" (Luckey, 2017a). Rich McCormick (2017) at *The Verge* speculated that it might be a "cryptic reference to a potential gag order, indicating that some entity had previously stopped him from posting what he wanted to, or could simply be an expression of interest in an anime series" (para. 6). But Luckey would offer another hint to the reference while attending an anime event in Japan the following month. In an interview that was translated to Japanese and then to English, Luckey reflected on the villain from *Sword Art Online* and the villain from *The Matrix* to discuss his idea of a game with a 'real result,' a game with the "same serious results in the real world as in the game world" (Lang, 2017, para. 8). He went on to say, "This concept of 'serious results' is part of one of the projects I am working on. But I won't talk about any details" (para. 17). The interviewer replied, "Your next project sounds very intriguing" (para. 19). Once revealed, it was true that his next project hinged on 'serious results.'

On April 1st, the day after he left Facebook, Luckey was already recruiting for a new company called Anduril, named after a sword from *The Lord of the Rings*, which he and his co-founder Trae Stephens hoped would be like Stark Industries, the private military contractor from the *Iron Man* comics (Levy, 2018). While it may be self-evident that these references to pop culture indicate that Luckey interprets or communicates his worldview through the media he consumes, these choices also denote an intended audience who might interpret these references as righteous and/or heroic. Similarly, the 'Our Leadership' section of the Anduril website contends that the tragedy of September 11th mobilizes a 'national purpose' and a 'duty' from the private sector, and by extension private citizens (Anduril Industries, n.d. [b]).[22] The 67-word statement references 'America' twice, and a 'national' responsibility twice. Like the alt-right framing of a 'real America' that must be protected, the rhetoric suggests that for the sake of the nation, it is up to this private citizenry to "step up and solve crucial national security problems"[23] that, by implication, a government with one of the largest armies and the largest intelligence agencies in the world could not solve. Palmer Luckey's biographical blurb on the site includes his "belief that radical modernization of US military technology is a prerequisite for preserving our way of life" (Anduril Industries, n.d. [a], para. 4). What this 'way of life' entails or how it is in danger is not clarified, but it is essential that it be preserved.

In a profile for *Wired*, Steve Levy (2018) interviewed Luckey and the other founders of Anduril, documenting the beginnings of Luckey's new venture. According to Levy, while the

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[22] On September 11, 2018, Luckey retweeted a post from Anduril industries reiterating this content (Anduril Industries, 2018).

[23] This phrase has been removed from the current version of the website. On the website and Twitter handle @anduriltech, the current messaging appears to focus more on 'disrupting' the military-industrial complex: "We started Anduril to disrupt an antiquated approach to defense; and in doing so, save lives, save taxpayer money, and make the military-industrial complex way less complex." (Anduril Industries, n.d. [a]).

young men at Anduril had many ideas (including 'sci-fi fantasia') for solving America's foreign and domestic problems, it was Luckey who recommended that rather than deploy their 'perimeter security' idea in warzones, they could apply it at home for border security. Their prototype system, called Lattice, used "three portable, 32-foot towers packed with radar, communications antennae, and a laser-enhanced camera" (para. 4), in order to detect humans in the distance, and to track and display their movement in a VR headset.[24] The system did not discriminate who it detected. Levy writes, "In a 10-week span since the towers were installed, Lattice helped agents catch 55 people and seize 982 pounds of marijuana. (For 39 of those individuals, drugs were not involved, suggesting they were just looking for a better life)" (Levy, 2018, para. 37). In this instance, despite a majority of the people apprehended likely 'looking for a better life,' taking Luckey's bio on the website along with Anduril's leadership statement, these people nevertheless represent 'crucial national security problems' that could impinge on Americans' 'way of life.' Their capture is represented as a success. It is a realization of the company's goals. As Levy writes, "Transforming consumer tech's plowshares into swords is ultimately a dark pursuit" (para. 50). Through Luckey, consumer VR transitioned from a platform for games to a platform for surveillance and law enforcement. Luckey's technical skills, creativity and interest is apparently just as easily applied to the military as it was to the games industry.

[24] Levy reports that the original prototype had glitches, "In some light, for example, the system can mistake the rear end of a horse for a person" (Levy, 2018, para. 29). To be fair, I have also, on occasion, confused a person for a horse's ass.

As VR is (re)incorporated into the military-industrial complex of the United States through Anduril's efforts to secure government contracts, Luckey's politics have finally become a focus:

> When asked about [his politics] now, the normally buoyant Luckey drops his smile and chooses his words carefully, claiming that his politics are misunderstood. "The alt-right, as it exists, as it's defined, I do not support, never have," he says. He describes himself as "fiscally conservative, pro-freedom, little-L libertarian, and big-R Republican." (Levy, 2018, para. 13).

Like Luckey's other defences of his politics, his actions contradict his statements. In his 2016 apology on Facebook, he identified as a libertarian who planned to vote for Gary Johnson,[25] with no mention of also being a 'big-R Republican'; his Twitter likes of Nicole Edelmann's gamergate posts and his endorsement of Nimble America suggest that he did indeed support aspects of the alt-right; his vague notion of 'pro-freedom' aligns with right-wing discourse in which social progressivism or oppositions to the military are framed as anti-freedom; even his assertion that he is fiscally conservative seems out of place given his $100,000 (USD) donation to an inauguration celebration. And although Luckey derides 'guilt by association,' these associations shape the political contexts for his proposed future of VR technologies. When he pitched Anduril's border wall idea to Ryan Zinke, then the U.S. Secretary of the Interior, he went with white supremacist Chuck Johnson (Cameron and Menegus, 2017).[26] A month later, Palmer Luckey was photographed during a visit to the White House, grinning with Chuck Johnson and

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[25] In order to provide 'more background,' he added that he was a libertarian and planned to vote for Gary Johnson. If this were true, how did Luckey expect that an alt-right, pro-Trump group would help Gary Johnson?

[26] The fact that a website called *VR and Fun* was tasked with reporting on this meeting (Kim, 2017) encapsulates in a moment the state of VR as described by this dissertation.

Steve Bannon in front of the California flag and the American flag (Resnick, 2017).[27] Whereas previously Luckey's politics were ignored or seen as a disadvantage, now Luckey's politics—both implicit and explicit—had become integral to his success.

Conclusion

The promotion of Palmer Luckey had deeper political consequences than Luckey could have had on his own. With news outlets and multinational corporations rushing to promote VR, there was an implicit rush to maintain the status quo within a culture that demanded real social change. One of the ongoing effects of this headlong technological pursuit for VR is that it creates a sense of urgency that displaces the actual urgent need for reformation and change within the sector. There continues to be a need to address problems with regard to equity, diversity, and inclusion within technological cultures. This is where the sense of urgency and the call to action is warranted. But figures like Palmer Luckey help to frame another narrative, proclaiming a need for change without requiring actual change within the existing social structures that already support their work. In this sense, Palmer Luckey is an engaging distraction. His eccentricity is familiar and engaging and it draws attention. In 2013, Nick Wingfield at *The New York Times* wrote, "If the company is successful, it will have a lot to do with Palmer Luckey, the 20-year-old founder of the company, who seems to have wandered out of a casting call for unconventional, young technology entrepreneurs" (Wingfield, 2013, para. 17). Wingfield could not have known

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[27] Beyond the implications of the company he smilingly keeps, two additional factors drew my attention. The first is the A-OK gesture from Luckey and Johnson. When the photo surfaced, ShareBlue Media called these gestures 'white power' signs'; Luckey was quick to call this 'fake news,' stating that they had fallen for a 4chan 'hoax' to get people to believe that the A-OK gesture signaled white power (Luckey, 2017c). That it may have been a 'hoax' seems beside the point: he still seems to be saying that he knew about this meaning when he did the gesture. The second factor is that the picture appears to be a picture of a framed photograph. I have not been able to find out where the actual photo comes from, or who printed it and framed it. By 2019, the gesture would be categorized as a 'symbol of hate' (Allyn, 2019).

that by 2017, he would be writing about how Luckey had a fundraiser for Senator Ted Cruz, or how controversial Facebook board member Peter Thiel hopes to invest in Anduril, or that Luckey is said to be a 'prepper' (i.e., preparing for social and/or political collapse), spending his money on 'military vehicles' and abandoned missile silos (Wingfield, 2017). Even now, Luckey's eccentricities distract from the wider impact of his current efforts.

The politics that Luckey represented when they were implicit helped to normalize VR as yet another domain for young, white, cisgender, able-bodied, middle-class men. Although clearer now, Luckey's politics are not necessarily easier to refute. After the controversies discussed in this chapter, Luckey asked to become a moderator for the Oculus subreddit and he was granted the role. He wrote, "It has been incredible watching this sub go from a hyper-niche enthusiast hangout to the mainstream" (quoted in Maiberg, 2018, para. 4). The transition to the mainstream could only have happened with the support of a community. Questioning the earlier days of Luckey's promotion would have been akin to questioning the foundations of this community. It would have required more interventions like M Eifler's at the first Oculus Connect: striving to reveal the politics that were implicit, and to seek changes amid explicit evidence of social inequality. A relevant discussion of gamergate and sexism within the industry was dismissed and/or ignored. It was an intrusion on the status quo; matters of social justice interrupted a narrative of technological progress. As gamergate showed, the progressive work of challenging this narrative came with risks of exclusion and of violence. When those already in power felt threatened by demands for change, the alt-right gave them a new platform by helping to make their politics explicit.

Across varied forms of public discourse around VR between 2012 and 2018, Palmer Luckey's voice is ever-present. Today, reading the comments to his tweets and posts contains

both supporters and detractors. If Luckey was disgraced by his political affiliations or humbled by his departure from Facebook, his posts and interviews do not show it. There is the same sense of purpose and resolve, directed now at another pursuit. The news media is calling it a 'second act,' a 'comeback' (McFarland, 2019). In 2018, an industry report indicated that developer interest in creating games for VR was 'waning' (Rosenberg, 2018). This would match Luckey's post-Oculus ambitions, as well as those of representatives from Google and Facebook. Games were just the beginning, mobilizing a community of developers, players, journalists, and commentators around a cause they could believe in: Palmer Luckey and a 'revolution' offering more of the same.

Chapter 5 - Virtual Bodies Inc.: Corporate Mediations of Bodies in VR

Introduction

> But the Panopticon must not be understood as a dream building: it is the diagram of a mechanism of power reduced to its ideal form; its functioning, abstracted from any obstacle, resistance or friction, must be represented as a pure architectural and optical system: it is in fact a figure of political technology that may and must be detached from any specific use.
>
> —Michel Foucault, *Discipline and Punish*

At the 2016 Facebook conference, Yaser Sheikh, a professor at Carnegie Mellon University who would soon also become director of Facebook Reality Labs, described a vision of VR as an invisible machine: "Imagine a social experience in virtual reality that's completely indistinguishable from a real-world interaction in every aspect … where the technology disappears and you're simply interacting with another person" (Sheikh, 2016, 00:20). The prototype of this 'disappearing' data collection machine for the future of VR is a 500-camera dome that Sheikh and his researchers call 'The Panoptic Studio,' without any direct reference to Jeremy Bentham, Michel Foucault, or the disciplining power of the panopticon, a structure that automates surveillance through the seeing power of the apparatus and through the knowledge of being seen. Instead, this vision of an everyday, personal panopticon is framed as 'the future of connection,' a tool to create, communicate, and to deliver 'authentic social presence' (Tech@facebook, 2019). As Michael Abrash (2017) affirms, it is a vision that can only be accomplished "by gathering lots of data" (para. 88). How this data is framed and understood is a key factor in the politics of VR: an apparatus like the Panoptic Studio at Carnegie Mellon University is not the same when it is rebuilt at Facebook Reality Labs, and it is not the same if it is one day worn as a VR headset. The underlying technologies may be similar in each case, but as control moves from academia to industry, what might originally have been a technological

interpretation of 'social presence' becomes a corporate call for more extensive data collection, sold with the promise of transformation.

In this chapter, I examine how industry leaders frame these types of technological mediations, and how their discursive constructions attempt to support and legitimize increasingly sophisticated forms of data gathering. I begin with a brief review of some of the broader claims of VR research to link developers' language and the language of academia, in which technological mediation is said to create the conditions for pro-social change. The next section examines how these claims are embedded into the framing of VR as an 'empathy machine': despite ongoing criticism, the ontological construction of VR as 'natural' reinforces a framing of VR as an affective, humanitarian technology built by seemingly altruistic corporations. I then turn to two books that are frequently referenced by Michael Abrash and Palmer Luckey: Neal Stephenson's (1992) *Snow Crash*, and Ernest Cline's (2011) *Ready Player One.* Not only do the books act as a shorthand for a future vision of VR, they also serve the purpose of furthering an ontological framing of bodies and worlds as data, making the escape from the body appear desirable, with virtual worlds promising knowledge and transcendence. The final section analyzes direct examples of industry discourse to further examine the corporate benefits of these ontological and epistemological constructions.

While there is some necessary overlap in this chapter, including a discussion of 'empathy' discourse as well as the colonial language of 'new frontiers' used to mobilize (young, white, male) audiences, an overarching theme in this chapter is the ontological and epistemological basis of these claims. Across these frames—whether in co-opted academic language, empathy, science fiction, or industry discourse—the same constructions are repeated. What corporations ultimately gain is control over biometric and public information, normalizing

not only new forms of data gathering but also the labour and technologies that make these endeavours possible. A narrative in which bodies and worlds can be (re)constructed as units of commodifiable data is also a narrative that justifies corporate ambitions to collect that data and extend their control.

Co-opting the Laboratory's Language

> "Their point is that at some level, language has to happen inside the human brain. Since all human brains are more or less the same—"
> "The hardware's the same. Not the software."
> "You are using some kind of metaphor that I cannot understand."
>
> —Neal Stephenson, *Snow Crash*

Nash (2018) and Rose (2018b) both refer to 'presence' as a defining feature of VR and its discourse, using the term 'immersion' as a key descriptor for documentary media in VR. For some practitioners, these words operate as superlatives, buzz words representing the unknown 'opportunities' of the medium: "VR evokes a higher degree of immersiveness, giving journalists opportunities they do not fully understand yet" (Sánchez-Laws and Utne, 2019, p. 8). For industry leaders, the language offers a way to mobilize interest by defining the 'unique' qualities of VR. In a 28-minute talk at the Steam Developers conference, Michael Abrash (2014a) uses the word 'presence' 46 times, saying that although it is 'hard to quantify,' it is 'unique to VR.' At Google, Clay Bavor and his employees speak about creating 'incredible, rich, immersive VR experiences' that deliver a 'sense of presence' (Google Developers, 2016a). At Facebook and Oculus, Zuckerberg and his employees speak about 'the magic of presence' and 'immersive experiences' (Oculus, 2017c). "For many people," Abrash (2014a) claims, "presence is simply magic" (para. 32). This promise of immersion and presence—a promise of 'magic'—has come to define the idealized 'experience' of contemporary VR.

While the mobilizing potential of this language is reason enough to justify its use, there are also decades of VR research that can help to establish a conceptual foundation for these terms. If the panopticon is also a "laboratory… a machine to carry out experiments, to alter behaviour, to train or correct individuals," (Foucault, 1995, p. 203) a brief history of VR research offers at least a glimpse at the language of this particular laboratory. In 2016, Oculus would fund prolific VR researchers Mel Slater and Maria Sánchez-Vives (2016) to write an overview of VR, suggesting, at least, some awareness of their work. My review here is not nearly as comprehensive as what Slater and Sánchez-Vives provide, and a more detailed examination of the methods, claims, and results of this academic work is beyond the scope of this chapter. This section only provides a rough sketch of historical and contemporary VR research to show that developers' language and claims for the body are not new, nor are the purportedly transformative experiences guaranteed in VR. If industry and academia show parallels in their ontology and epistemology, or parallels in their stated potential for the technologically mediated body, it begins, perhaps, with a shared language.

In the early 1990s, when Slater started his first VR lab, "there was a massive wave of public enthusiasm and hype, very, very, very similar to now" (Slater, 2017, 01:54). Although public enthusiasm faded, the research went on. Slater (2017) describes today's enthusiasm as nothing new: "We've been through this before" (01:44), and indeed Slater's early research establishes a foundation for corporate claims of 'immersion' and 'presence.' For example, Mel Slater, Martin Usoh, and Anthony Steed (1995) assert that the available sensory 'data' provided

by technology is 'immersive' insofar as it informs a perceived reality.[28] They write, "We use 'immersion' as a description of a technology, rather than as a psychological characterization of what the system supplies to the human participant" (p. 204). Here, the ontological distance between reality and virtual reality is a technological hurdle: a virtual environment that provides the same sensory information as reality would be akin to reality. The authors suggest that 'presence,' defined as a "psychological sense of 'being there'" (p. 204), is the measurement of that ontological distance.[29] Technological immersion is, in part, an effort to 'shut out' physical reality while providing the greatest amount of sensory information through technological means[30] (Slater and Wilbur, 1997). Though Slater and his colleagues acknowledge a spectrum of immersion, and note that greater immersion does not necessarily lead to greater presence, there is an implicit hierarchy of sensory information in which the visual can be privileged over other modalities,[31] and in which social and environmental conditions can be excluded in favour of a controlled set of technological substitutions. Immersion is the technological substitution of reality at a loss.

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[28] Their theoretical foundation in 1995 was James J. Gibson, who describes a link between self-perception and the perception of an environment; Gibson's perceptual theory was still referenced in Slater and Wilbur (1997), but the theory appears to be seldom used after that, possibly because the late 1990s featured a greater confluence of academic perspectives on 'presence' in VR.

[29] Note that this is ongoing research. Industry-led claims about 'presence' in 2016 overlook the fact that by 2009, Slater would divide 'presence' into Place Illusion (PI) and Plausibility Illusion (Psi), which combine to produce a Response-as-if-Real (RAIR). 'Presence' had become too problematic a term in the intervening decade, in part because it was subjective, a *qualia* with "no way to directly measure it" (Slater, 2009, p. 5).

[30] Note that this is in reference to one of four characteristics of 'immersion,' although all four have to do with the (technological) ability of the simulation to supplant reality.

[31] Slater (2009, p. 11) contends that there can be a Place Illusion for individual senses separately, i.e., simultaneously a compelling sense of visual presence without a sense of aural presence. While this may also suggest an ontology of the body in which the senses can be construed as essential and independent variables, the research is also based on the notion that in particular configurations, particular senses will override and/or interact with one another (see e.g., Botvinick and Cohen, 1998).

In their technologically-determinist form, the ontological conditions of VR research provide an epistemological foundation for academic inquiry. Technology is said to provide the tools to construe bodies, subjectivities, and knowledges as malleable. According to Slater (2009), "Virtual reality can not only transform your sense of place, and of reality, but also the apparent properties of your own body" (section 6, para. 4). In other words, if technology can sufficiently change the perception of reality, one's self-perception within (and beyond) that reality might also change. Slater and other VR researchers assert that experiments in cognitive neuroscience like the 'rubber hand illusion'[32] can be replicated in VR (Slater et al., 2008), and can be expanded to transfer one's sense of ownership onto a separate body, whether real or virtual (Slater, 2009). For example, Valerie Petkova and H. Henrik Ehrsson (2008) show a transfer of body ownership first to a mannequin body and then to another human body.[33] Building on similar 'body-swapping' principles, VR has been used to investigate the change in attitude for an adult in the body of a virtual child (Banakou, Groten, & Slater, 2013), for a 'light-skinned' person in a 'dark-skinned virtual body' (Maister et al., 2015; Peck et al., 2013; Slater and Sánchez-Vives, 2014), and even male domestic abusers in the body of a virtual female victim (Seinfeld et al., 2018). As Maister et al. (2015) claim, "[C]hanges in the perceived similarity between self and others, caused by shared multisensory experiences, might 'bridge the gap' between the basic, perceptual representation of bodies, and the complex social mechanisms underlying much of our everyday social interaction" (p. 9). The authors contend that manipulating a participant's self-perception is

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[32] In a carnivalesque demonstration for the BBC, Larry Rosenblum, a professor of psychology and author of *See What I'm Saying*, brushes the fingers of an in-view rubber hand while simultaneously brushing a participant's actual hand out-of-view. After the voice-over narration describes that this is "enough to trick the brain into adopting it as its own" (00:59), and after Rosenblum confirms with the participant that it feels like the rubber hand is their own, he smashes it with a hammer to the apparent shock and delight of the spectators (BBC Studios, 2013).

[33] After the 'body-swapping' is established, one measurement includes the physical threat of a knife to the new body and the participants' resulting level of anxiety: to have a body is apparently to be anxious for that body.

enough to manipulate their perception of others, despite 'the complex social mechanisms' of everyday life. While these experiments perhaps raise more questions than they answer—e.g., about how the social and ethical characteristics are considered—the preliminary results of this research indicate the possibility of positive, pro-social change. The ontological and epistemological premise is consistent with earlier conceptualizations: the technological remediation of bodies and worlds is said to present opportunities for new cognitive and embodied knowledge.

When taken up by other sites of research, a closer look at the pro-social benefits of VR reveals not only a wide range of possible applications, but also some of the limitations of these claims. The variety of clinical, psychological, and embodied applications of VR (see e.g., Riva et al., 2016 for a review of meta-analyses) includes treatments for body dysphoria, body image, and weight-related conditions (e.g., de Carvalho et al., 2017; Keizer et al., 2016; Wiederhold, Riva, and Gutiérrez-Maldonado, 2016), exposure-based treatments for a variety of anxieties and phobias (e.g., Maples-Keller et al., 2017; Parsons and Rizzo, 2008), as well as treatments for physical rehabilitation (e.g., Laver et al., 2015) and pain management (e.g., Indovina et al., 2018). While these studies offer positive results, it is important to note that many of these results are preliminary and often rely on specific—rather than generalizable—conditions. For example, in their systematic review of VR used for the treatment and/or assessment of psychosis spectrum disorders, Rus-Calafell et al. (2018) contend that although the use of VR shows potential, especially in the ability to modify environments and assess participant behaviour under particular conditions, "these results should be taken cautiously" (p. 21). The authors note that current evidence includes small sample sizes, a failure to account for confounding factors, a lack of longitudinal evidence, and a lack of evidence within clinical contexts. These are applications that

must be “delivered and monitored by professionals, with a clear contextualisation and debriefing after completion of the task” (p. 18). In other words, while these varied applications of VR represent an active and potentially promising site for research, the specificity of the clinical contexts and the limitations undermine a generalized and deterministic corporate appropriation of claims about the pro-social benefits of VR.

Across the wide variety of experiments that document ‘malleable’ bodies and subjectivities, a common factor is a technological mediation that presents alternate visions of reality or of the self. The implied ontology and epistemology—more directly stated in VR research from the 1990s—suggests a view of the world that consists of individual, egocentric bodies composed of interchangeable units. This is an ontology in which senses, environments, societies, people, and cultures are all interpreted as data. The proposed technological substitution is said to be possible because the world of bits is understood to be sufficiently akin to a world of atoms. This ontology, in turn, implies an epistemology in which knowledge and understandings of the world can be achieved through technological substitutions and representations that replace one unit for another. While the theoretical framework of this dissertation provides a critique to such positivist and essentialist equations that appear to disregard situated subjectivities and the networked, mediating presence of the apparatus, there are additional considerations when these constructions are adopted by corporations.

When industry leaders draw on the language of ‘immersion’ and ‘presence’ in VR, whether with direct or indirect reference to VR scholarship, there is a shift in power from academia to industry in the ability to define the foundations, limits, and scope of contemporary VR. There is also an apparent effort to repurpose the language for its mobilizing potential. Even though a term like ‘immersion’ has been dismissed as a vague and overused buzzword more

suited to advertising than creative efforts like game design (Anthropy and Clarke, 2014), it has an important parallel history in media studies to denote affective, aesthetic, or literary qualities within and beyond interactive content (Murray, 1997; Ryan, 2000). The co-opting of the claims and language of VR research allows for a kind of triple-use: it is simultaneously the language of advertising, a descriptor of narrative apotheosis, and the universalizing language of transformation in VR scholarship. The following sections examine how and why industry leaders appear to be applying these constructions, and how they support a corporate vision of VR.

The Nature of the Empathy Machine

> And the white man get paid off of all of that.
>
> —Kanye West, *All Falls Down*.[34]

A week after Hurricane Maria dissipated, Facebook CEO Mark Zuckerberg and Rachel Franklin, the head of social VR at Facebook, put on VR headsets and live-streamed their smiling cartoon avatars as they floated through 360-degree video footage of the wreckage in Puerto Rico (Zuckerberg, 2017b). "We're on a bridge here, it's uh, it's flooded," Zuckerberg says. "You can get a sense of some of the damage here that hurricane, that the hurricanes, have done" (02:14) Behind Zuckerberg and Franklin, a video cuts between scenes, now showing men gathering water. "And um, I mean this is, one of the things that's really magical about virtual reality, is you can get the feeling that you're really in the place" (02:33). Although ostensibly an effort to raise

[34] Chris Milk, founder of VR company Within and advocate of VR as 'empathy machine,' directed the music video for West's *All Falls Down*, showing an aptitude as early as 2004 for first-person perspective storytelling. Milk's work also shows a willingness and interest in exploring the storytelling possibilities of new media. In his VR talks, Milk (2015, 2016) draws a link between his past work and his current work to strengthen the empathy claim, as if empathy defines his creative pursuit and culminates with VR. Yet this history of storytelling with new media also provides another possible explanation for why his work might provide an affective response, whatever the medium: he's good at what he does. Incidentally, *All Falls Down* is a comment on consumerism; as this section will show, empathy is also for sale.

awareness and to highlight Facebook's contributions to relief efforts, the disconnect between their technological voyeurism and the lived, ongoing suffering of the victims of Hurricane Maria and Irma prompted a backlash in the media (Andrews, 2017; Matney, 2017b; Solon, 2017a) and a response from Zuckerberg the next day: "When you're in VR yourself, the surroundings feel quite real. But that sense of empathy doesn't extend well to people watching you as a virtual character on a 2D screen. That's something we'll need to work on over time" (quoted in Kastrenakes, 2017, para. 4). Zuckerberg's presumption of empathy does little to justify the classed, raced, and gendered voyeurism of this kind of Western, risk-free, disaster tourism, but his response implies that VR is still the solution: if we were there in VR with him, we might understand the 'sense of empathy' he claimed to feel.

Despite this insistence that VR engenders an empathetic response, contemporary discourse presents detractors and promoters alike. For detractors, Zuckerberg's virtual tour of Puerto Rico in the aftermath of Hurricane Maria and Irma was proof of the danger of empathy rhetoric. Jaron Lanier, who co-authored an essay in 2015 about 'homuncular flexibility,' which proposed that VR could be applied to generate empathy for other humans as well as other species (Won, Bailenson, Lee, and Lanier, 2015), called Zuckerberg's tour a 'ridiculous fail' (Robertson, 2017), and cautioned that such efforts could be a 'narcissism magnifier' (Lanier, 2017, p. 142). Writing for *BuzzFeed News*, Ainsley Sutherland (2017) wrote that companies like Facebook and Google are using a "muddy, unclear, superficial definition of empathy" (para. 12), concluding that it is more storytelling technique than characteristic of the medium, as well as an effort to legitimize VR for a wider audience by expanding content beyond games and porn. Ben Tarnoff (2017) at *The Guardian* seconded this latter point, while also stating that it fits into a narrative of "Silicon Valley's oft-expressed desire to make the world a better place" (para. 10). Earlier that

same year, Paul Bloom (2017), writing for *The Atlantic*, called attempts to generate empathy in VR 'dangerously misleading' simulations because they lack the contextual, long-term characteristics of the lived experiences of suffering, disability, or difference. Bloom writes, "You can't take an event of minutes and hours and generalize to months and years" (para. 11). Common to these critiques is a call to temper the link between empathy and VR, and to draw attention to where power lies: with the corporation and the consumer rather than with the represented 'other.'

Before backlash and critique had become more common, the production and promotion of VR content by reputed outlets had lent their weight and legitimacy to VR, specifically targeting their existing audiences with VR content and the promise of new experiences. Hyperbole was common, and corporate partnerships had been integral since the beginning. In 2014, Gabo Arora and Chris Milk partnered with Samsung and the United Nations to produce *Clouds Over Sidra* (Arora and Milk, 2015), a VR documentary about the Syrian refugee crisis. The film premiered at the World Economic Forum in Davos in early 2015. That same year, *The New York Times* partnered with Google to send over a million Cardboard VR viewers to its print subscribers; in 2016, they sent another 300,000 to digital subscribers (Robertson, 2016b). At the time of the partnership, *The New York Times Magazine* editor offered an unsubstantiated declaration of the 'power' of the medium: "The power of VR is that it gives the viewer a unique sense of empathic connection to people and events" (as quoted in Jackson, 2015, para. 5). Due in part to the film's success, Chris Milk (2015) would call VR an 'empathy machine,' an object to 'change the world' and to 'make us more human,' helping to solidify a presumed link between the technology and its promise of pro-social transformation.

Chris Milk became a common rallying point for promoters. Based in part on the success of Milk's VR documentary, the UN website (UNVR, 2018) contends that their VR initiative is "pushing the bounds of empathy" (para. 1), writing, "The Campaign has targeted decision makers primarily in the first phase of the Virtual Reality Project to spread awareness and create empathy; however there is great potential to do more" (para. 5). The 'great potential' is assumed and not clarified; when empathy is so easily 'created,' the positive effect of VR is made certain. As a frame, the promise of empathy offers corporations opportunities for 'humanitarian sponsoring' (Höijer, 2004; Irom, 2018), in which the image of corporate altruism obfuscates its capitalist underpinnings. For example, in a 2016 promotion, the packaging of a twelve-pack of Coca-Cola would fold into a Google Cardboard headset. The write-up states, "[*Clouds Over Sidra*] has created empathy across the global community, but especially among decision makers with power to affect change in the lives of people subjected to conditions similar to those depicted in the film" (Coca-Cola, 2016, para. 3). When the sale of VR is the sale of empathy, the technology becomes a tool for the perception of altruism, and a tool for mutually beneficial corporate relationships.

For the consumer, the pro-social framing provides an expected, idealized response to the content: it presents mediated bodies affectively improved by technology. As Lisa Nakamura (2019a) observes, at a time when tech-based outlets like *O'Reilly Media* and *TechCrunch* began to look inwardly, judging that technological growth must face a 'reckoning' for its unfeeling role in world affairs, technologically-enabled empathy is presented as a solution. For Nakamura, as VR becomes a tool to automate the 'labour of feeling,' the truth of VR's empathy claims is measured in tears. In these cases, the corporation provides an example of the idealized experience. The Coca-Cola (2016) article, for example, quotes Milk throughout; the claims of

empathy and 'change' by 'decision makers with power' are substantiated by Milk's claims that his team had to throw away headsets that were "getting soggy from people crying" (para. 4). Early reports were just as fawning as the corporate advertising, as if the advertising provided a template for the 'experience.' At *TechCrunch*, Mike Butcher (2015) extended his appraisal of the film to an appraisal of the technology: "As a way to create empathy with a subject, it's definitely a harbinger of things to come" (para. 1), an example of how VR could provide a "powerful, immersive and deeply moving experience" (para. 1). In the accompanying video, Butcher briefly interviews a producer of the film, Socrates Kakoulides, who characterizes the film as "an immersion experience … to help generate empathy" (1:40). With Kakoulides still present but off camera, Butcher puts on a headset and watches the film while describing what he sees. He concludes by taking off the headset and saying, "I'm going to stop there, and I'll just say—I'll just say—I'm [he wipes his eyes and chuckles] crying inside this [he gestures to the headset]. This is probably one of the most vivid experiences of my life" (09:26). In this moment, gesturing to the headset, the experience of this particular content becomes indicative of the potential of the technology. With reddened eyes, Butcher validates claims about VR, both for his viewers and for a producer of the film. No other response would have been acceptable.

Despite the hypervisibility of a technology that covers half the face, a consistent selling point throughout this discourse is the headset's presumed invisibility and the medium's nonmediation (Golding 2019; Irom, 2019; Nakamura, 2019a). This framing is integrated into claims about positive, transformative, and pro-social change, and demonstrates an application of the academic constructions that position reality inside the headset as ontologically equal to reality outside the headset. "In all other mediums," Chris Milk (2016) said in his second TED talk on VR, "your consciousness interprets the medium. In VR, your consciousness is the

medium" (05:48). Consciousness-as-medium justifies a universalizing, automatic, affective experience by equating a medium with consciousness, equating technology with biological, perceptual awareness. Like Slater's (2009) presence, affective experiences are presented as 'automatic' under the correct conditions of technological immersion. Within such arguments, VR is said to offer the best (most ontologically symmetrical) media presentation of reality (see e.g., de la Peña et al., 2010). 'Experience' is made possible by the medium and justifies the medium's use. Because these realities are also virtual, there appears to be an implicit belief in apolitical scientific and creative pursuit, as with Slater's and his colleagues' work that takes up 'immersive journalism' by putting the user in the body of Lenin (apolitically characterized as a 'famous leader') giving a speech (Slater et al. 2018). When VR is framed as 'natural,' the implied assertion is that its (non)mediations are as apolitical as the (non)mediations of nature.

Claims of empathy and transformation in VR demonstrate recurring exclusions: the quality of the content is an afterthought, the various effects of the required technologies are not mentioned, ableist expectations of vision and sensory experiences are presumed, corporate expansion is either moot or harmless, and the power dynamics between represented and representing bodies are not considered. Just two days after his virtual tour of Puerto Rico and the subsequent media backlash, Mark Zuckerberg outlined his vision for VR:

> Standing up here today, I am more committed than ever to the future of virtual reality. It's not about escaping reality, it's about making it better. It's about curing diseases, connecting families, spreading empathy, rethinking work, improving games, and yes, bringing us all closer together. (Oculus, 2017c, 14:33)

Within this techno-utopian frame, 'spreading empathy,' like the contention of 'spreadable media' (Jenkins, Ford, and Green 2013), assumes digitally connected cultures, assumes that empathy is

an affordance of the technology rather than an affective interpretation of content, and assumes a neoliberal alignment of corporate and personal interest in 'sharable' media. When affective responses in VR are deemed 'natural,' the contingent technologies also become 'natural,' justifying a corporate expansion of mediated realities. In Haraway's (1988) terms, this understanding of VR is an "ideology (…) whose technological mediations are simultaneously celebrated and presented as utterly transparent" (p. 582). Or, in Fisher and Schoemann's (2018) terms, it offers an "immediate corporate commodification of pain" (p. 583) while claiming it is for the good of humanity. Buy a Coke, put on a Google headset, save the world, post it on Facebook. When the 'magical' potential of technologically-enabled embodiment is justified by VR, VR justifies the mediating presence of the corporation.

The Metaverse and the Meat Sack

> "Hah! But sensations are *mental* phenomena. They exist in our minds. How, then, do we know that the objects themselves do not exist only in our minds?"
>
> —Stanley Weinbaum, *Pygmalion's Spectacles*

Although VR has been a staple of science fiction since at least Stanley Weinbaum's *Pygmalion's Spectacles* (1978/1935), for Michael Abrash and Palmer Luckey, the contemporary vision of virtual reality appears to be shaped by two novels: Neal Stephenson's (1992) *Snow Crash*, and Ernest Cline's (2011) *Ready Player One*. These books were apparently seen to have strong communicative potential. Describing early adopters' conceptions of consumer VR, Maxwell Foxman (2018) writes, "[The] use of Virtual Reality is still envisioned within the context of science fiction, even while being worked on in the present. Many enthusiasts endorsed Ernest Cline's *Ready Player One* and insisted each other read it" (p. 223). As enthusiasts themselves, Luckey and Abrash would repeatedly endorse both books well before consumer VR

was released to the public, and to some extent these books became endorsements of VR. A story that Abrash tells in 2012, of reading the book in the early 1990s, meeting John Carmack, becoming persuaded by a shared enthusiasm for 3D virtual worlds, is the same story that he tells in January 2014 to describe how he joined Oculus, again in March 2014, and again in 2016 (Abrash, 2012a, 2014a, 2014b, 2016). *Snow Crash* is a key factor in each account, but in the March 2014 account, Abrash's reading of *Ready Player One* coincides with Luckey meeting Carmack, which influences his decision to move away from AR to VR. For Luckey and Abrash, the books had become communicative tools, texts that are intertwined with their own conceptualizations of VR, presented as narratives that inspired them, and offered as inspiration for others.

The validations of the virtual worlds of *Snow Crash* and *Ready Player One* demonstrate how the books act as a frame, a way to use the language of these authors to describe and promote a particular vision of contemporary VR. In 2012, when Abrash was working at Valve (he would join Oculus in 2014) he referred to both books in a blog post to describe the differences between VR and AR, presenting their conceptions of virtual worlds as a shorthand to better understand what VR could be:

> If you're not familiar with VR and AR, VR is the one where you sit down, put on a headset, and find yourself completely immersed in a virtual world like Snow Crash's Metaverse or Ready Player One's OASIS (and if you haven't read Ready Player One, run don't walk; it's a great read, especially if you grew up in the 80's, but even if not – I didn't, and I still loved it). (Abrash, 2012b, para. 11)

In simple terms, then, the books are used for their depiction of virtual worlds; while knowledge of *Snow Crash* is assumed, *Ready Player One* is endorsed with excited urgency. Although both

Luckey and Abrash refer to *Snow Crash,* for Abrash, *Snow Crash* represents decades of inspiration. Abrash (2012a) wrote:

> It all started with *Snow Crash.*
>
> If I hadn't read it and fallen in love with the idea of the Metaverse [in the early 1990s], if it hadn't made me realize how close networked 3D was to being a reality, if I hadn't thought *I can do that*, and more importantly *I want to do that*, I'd never have embarked on the path that eventually wound up at Valve. (para. 1-2, original italics)

Abrash characterizes the pursuit as passionate (he had 'fallen in love with the idea') and as something that matched his ability and desire. While these personal origins stories offer a clear link between the VR of science fiction and the VR of industry, these stories could also act as a reminder that the 'innovation' of these industry leaders is initially limited to realizing the fictional innovation of others. By describing a shared vision with shared cultural references, the contours of the frame are established—including a desired affective response. VR becomes a pursuit, something to believe in, something to love.

As a communicative device, the audience of these endorsements is—at least initially—employees, prospective employees, and enthusiasts, pre-empting how VR is understood and defined. In 2013, when Palmer Luckey invited Ernest Cline to Oculus for a demo, he promoted the visit by suggesting that Cline's work directly inspires the employees at Oculus:

> I'm a big fan of *Ready Player One* and so are most of the other engineers in Oculus. In fact, one of them even joined the company specifically because they were inspired by the book to help make virtual reality possible. (Oculus, 2013, 00:00)

According to Luckey, many of the employees at Oculus already read science fiction, which he claims helps to clarify their future plans: "The goal is clear: It's to make VR technology that's as real as real life with none of the limitations" (Urstadt and Frier, 2016, para. 20). By 2016, two years after Facebook bought Oculus, each new employee at Oculus was given a copy of *Ready Player One* (D'Onfro, 2016). The book helped to establish a company narrative, and became a tool to help unify the company's vision for VR. Similarly, Abrash (2014b) uses the book to convince other employees of the merits of VR: "I read *Ready Player One*, strongly recommend it to several members of the AR group, and we come to the conclusion that VR is potentially more interesting than we thought, and far more tractable than AR" (para. 7). While this suggests that the opposite was once true—that VR was once not interesting to the same people who would eventually call for its development—these statements do not clarify why these books act as inspiration over other books. How do these books make VR 'interesting'? What do these books offer to these industry leaders, and what vision of VR do they communicate?

On the surface, similarities between the two books seem to speak to genre tropes rather than shared worldviews. In both, large, private, monopolizing megacorporations strive to extend their power. The characters escape to the virtual where there is some semblance of personal freedom. In *Snow Crash* the virtual is the Metaverse, in *Ready Player One* it is the OASIS, which is an acronym for Ontologically Anthropocentric Sensory Immersive Simulation.[35] The escape is an escape for millions from the ugliness of the real to the beauty of the simulation:

[35] In the book, this acronym is presented rather than explained, but given that the OASIS is also interpreted as emancipatory by the protagonists, it could be that anthropocentrism is not blamed for the 'ugly' state of the world outside the headset. Or, perhaps it simply means that it was designed for humans, and that the nonhuman was never a consideration.

> He's in a computer-generated universe that his computer is drawing onto his goggles and pumping into his earphones. In the lingo, this imaginary place is known as the Metaverse. Hiro spends a lot of time in the Metaverse. It beats the shit out of the U-Stor-It. (Stephenson, 1992, p. 24)

The Metaverse is a direct contrast to where the protagonist lives, a 'U-Stor-It' storage container that is also a metaphor for the limited, confined space of the real. Similarly, in *Ready Player One,* the OASIS is a 'happy refuge' from the 'ugly world':

> My generation had never known a world without the OASIS. To us, it was much more than a game or an entertainment platform. It had been an integral part of our lives for as far back as we could remember. We'd been born into an ugly world, and the OASIS was our one happy refuge. The thought of the simulation being privatized and homogenized by IOI horrified us in a way that those born before its introduction found difficult to understand. For us, it was like someone threatening to take away the sun, or charge a fee to look up at the sky. (Cline, 2011, p. 34)

The virtual world is presented as natural—a separate space that is still public and free, threatened by the corporation—IOI, Interactive Online Industries—but also outside its reach. It is something to be protected.

Mirroring this escape from the 'reality' of the city, in both books, the virtual body is the anonymous avatar; the body escapes its ugliness for the beauty of the avatar, or escapes the bounds of the human for the freedom to imagine another form. In *Snow Crash*, access to technology ('equipment') is the only limitation:

> Your avatar can look any way you want it to, up to the limitations of your equipment. If you're ugly, you can make your avatar beautiful. If you've just gotten out of bed, your avatar can still be wearing beautiful clothes and professionally applied makeup. You can look like a gorilla or a dragon or a giant talking penis in the Metaverse. Spend five minutes walking down the Street and you will see all of these. (Stephenson, 1992, p. 36)

Similarly, in *Ready Player One*, the escape from the self represents a creative opportunity to 'change' or 'become' someone or something else:

> You could log in and instantly escape the drudgery of your day-to-day life. You could create an entirely new persona for yourself, with complete control over how you looked and sounded to others. In the OASIS, the fat could become thin, the ugly could become beautiful, and the shy, extroverted. Or vice versa. You could change your name, age, sex, race, height, weight, voice, hair color, and bone structure. Or you could cease being human altogether, and become an elf, ogre, alien, or any other creature from literature, movies, or mythology. (Cline, 2011, p. 57)

The repetitions across these books (e.g., the 'ugly' becoming 'beautiful', the ugliness of the real compared to the possibilities of the virtual, or the 'escape' from the human form) suggest a relatively effortless self-actualization and transformation through the power of technology. It is something made possible by the Edenic virtual rather than the corrupted real, in which socially constructed identity markers are substantiated even as they are presented as malleable. It is a world that is conceived as separate, but that gains its value in relation to the real.

These visions for VR are not so different from utopian visions of the Internet, and as such are more or less descriptions of the imagined freedom that comes with any new plans for ubiquitous digital connectivity. Discourse that associates VR with connected futures and

imagined freedoms—part of the same kind of history-making described in Chapter 3—is so often the focus of attention that it can overshadow how and why the politics of these books might be compelling to industry leaders, as well as what makes these books troubling as visions for the future of VR. One way to problematize these books is to examine the gendered and racial politics of representation. Shira Chess (2017) draws on Cline's title for her book *Ready Player Two*, in which she examines the gendered politics of games designed for women. Because of its 'glorification' of games from the 1980s, Chess writes that *Ready Player One* also glorifies media that is designed, produced, and consumed by men: "[W]e are reminded who 'Player One' actually is, and has long since been—a white heterosexual, cis-gendered male" (p. 8). Despite the presence of characters who do not fit the hegemonic norm, or the fact that "it is also white males that run the corporate dystopia, suggesting that (perhaps) this rule of white masculinity is a double-edged sword" (p. 8), in the end, it is still a young, white man who saves the day. He wins by employing his knowledge of an idealized and depoliticized past that celebrates arcana established by white men. There is an easy parallel here to Palmer Luckey or even to Michael Abrash, privileged white men employing their enthusiast knowledge of VR technologies in order to present VR anew, as if cleansed of its exclusionary histories.

A related factor that also warrants further examination is that both books present diverse coalitions that come together to fight the evils of the megacorporation and to fight for the 'free' use of technology. These coalitions appear to present a kind of multicultural American dream, with heterogenous bands of individuals unified by a common cause. But there are cracks in this narrative. As N. Katheryn Hayles's (1999) analysis of *Snow Crash* shows, even though those who save the day are a coalition of people of various backgrounds, "Stephenson has something in his text to insult nearly every ethnic group imaginable" (p. 277). Similarly Shira Chess (2017)

notes that while the team in *Ready Player One* is diverse, its success is dependent on the knowledge and leadership of a young white man. These imperfect coalitions suggest that the point may not be the power of diversity as much as the power of technology. For Hayles (1999), the villains in *Snow Crash* fail in their technocratic pursuit in part because for them technology remains a tool to oppress rather than a vessel for emancipation and posthuman self-actualization, in which human and machine come together. In other words, the villains fail because of a flaw in their technological—rather than social—ideology. While VR is presented as a tool to mediate relationships and to make these coalitions possible, what seems to supersede the possible social commentary about race, gender, or class within these books is the notion that the (dominantly male) body is empowered and made visible by the virtual, and power in the virtual is maintained through technological knowledge.

When the reader is introduced to Hiro Protagonist in *Snow Crash* and Wade Watts in *Ready Player One*, both are already famous in the virtual world, and both have intimate knowledge of the workings of those worlds. They have achieved success in the virtual. While their affinity for the virtual is a source of conflict—a flight from the real—this conflict is offset by the knowledge that the virtual is also crucial for their ultimate success and survival. For Wade, the conflict in his flight from the real culminates in the last pages of *Ready Player One* when Halliday, the creator of the OASIS, virtually tells him that reality is the only place for 'true happiness' (Cline, 2011, p. 364). Although the moment simultaneously undermines the claim by showing that Halliday is able to express his true desires for the OASIS after death through the transcendent power of the virtual, a desire to return to the real is seemingly affirmed when Wade and Samantha finally 'meet' in the real world. The moment appears to validate their love for each other, especially as they are holding hands and "reveling in the strange new sensation of

actually touching one another" (Cline, 2011, p. 372). Even though the ending seems to suggest a return to the 'real,' it feels unearned in the sense that the book has otherwise established the virtual as a place to transcend the body, to excel and find fame, to find friendship and love.

The conflict embedded in a flight from the real is not uncommon to cyberpunk fiction and the speculative writings of the 1980s, and can be read alongside work in which the body is presented as an impediment, or something to be overcome. In William Gibson's (2000/1984) *Neuromancer*, the hackers derisively call the body 'meat,' a lower form of consciousness, a 'prison' of flesh that is no match for the "bodiless exultation of cyberspace" (p. 6). It is a thing to be ignored: "*Meat*, some part of him said. *It's the meat talking*, *ignore it*" (p. 146, original italics). This, in turn, is echoed in futurist writing like that of Hans Moravec (1997), whose visions of expanded, computer-supported consciousness were contemplated with a sense of certainty. Moravec's futures of super-minds suggested that it was inevitable that humans would leave the sensorial (i.e., useless) bodies behind. Moravec writes, "Picture a 'brain in a vat,' sustained by life-support machinery, connected by wonderful electronic links to a series of artificial rent-a-bodies in remote locations, and to simulated bodies in virtual realities" (para. 20). For Moravec, by entering into an age of technological advancement, biological humans must compete with artificial intelligence (AI) by becoming artificial and by replacing 'limbs and sense organs.' The great limitation, in this future, is the body: "Transplanted human minds will often be without physical bodies, but hardly without the illusion of having them" (para. 21). He contends that a reliance on physical objects and abstractions will hinder (technological) progress and diminish the ability to compete with AI, which will have no such hindrance. When it is perfected, the brain-in-a-vat becomes an AI supermind connected to other superminds; the

human can do little more than "wallow in the scenery provided" (para. 26). The body becomes useless meat; the mind is all that matters.

Accepting for the moment the dualism implied in these brain-body separations, this escape from the body is only possible because one of the two—the brain—is seen as capable of interfacing with the digital. If in *Ready Player One* the body is made into a tool to better serve the virtual,[36] it is only because of the initial inconvenience of the body; the thing that connects to the virtual is first and foremost the eyes and hands, a connection made through the VR headset and haptic gloves. Additional haptic wear is optional, suggesting a kind of sensory hierarchy. In *Snow Crash,* there is a more direct connection between brains and bits. As Hayles (1999) describes, "*Snow Crash* creates an *infoworld,* a territory where deep homologies emerge between humans and computers because both are based on a fundamental coding level at which everything reduces to information production, storage, and transmission" (p. 275, original italics). Not only is computation framed as natural, but humans are framed as data. Even if corporations are denigrated in cyberpunk fiction, this is finally a reason for the modern corporation to embrace these books. The books endorse and glorify the escapism that consumer VR is said to provide, and they also endorse an ontology in which bodies are made perfect by technology. Though often categorized as dystopias, they are spaces of capitalist wish fulfillment: both protagonists end by owning their own business which directly profits from their knowledge of the virtual. If the consumer sees their body as useless meat, sees the virtual as a place to achieve success, it is that much more easily acquired by the corporation that sees the body as

[36] Wade exercises and loses weight through self-imposed monitoring by his computer only because putting his health in jeopardy would put his virtual quest in jeopardy (p. 196-197).

useful data, as storehouses of information that can eventually be uploaded, analyzed, quantified, commodified.

MegaCorp and the Peeping-Tom Techie

> Well I'm heavenly blessed and worldly wise
> I'm a peeping-tom techie with x-ray eyes
> [Chorus]
> Things are going great, and they're only getting better
> I'm doing all right, getting good grades
> The future's so bright, I gotta wear shades
> I gotta wear shades
>
> —Pat MacDonald, *The Future's so Bright, I Gotta Wear Shades*

In a talk for the Global Grand Challenges Summit, Michael Abrash (2017) outlined a vision for VR based on a bold ontological claim: "All reality is virtual" (para. 4).[37] This claim offers, in succinct terms, a foundation and justification for technologically-mediated bodies. Abrash provides the following logic. First, with the claim that 'all reality is virtual,' Abrash implies that there is nothing ontologically distinct between virtual reality and reality. "That's a strong statement," Abrash acknowledges. "It's not obvious if you haven't thought about it before, so I'll say it again—the reality we experience is a construct in our minds, based on highly incomplete data" (para. 5). Abrash appears to be endorsing a mind-body hierarchy in which the body and the senses are subservient carriers of information to the mind. Moreover, this 'data' is 'highly incomplete,' suggesting that the senses are inherently flawed ("the very sparse data that

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[37] The claim is reminiscent of the first lines of *Pygmalion's Spectacles* (Weinbaum, 1978/1935), though I don't mean to call Abrash 'gnomelike' by drawing the comparison:

> "But what is reality?" asked the gnomelike man. He gestured at the tall banks of buildings that loomed around Central Park, with their countless windows glowing like the cave fires of a city of Cro-Magnon people. "All is dream, all is illusion; I am your vision as you are mine." (p. 73)

comes in through our senses" [para. 3]), and candidates for (technological) replacement. "So," Abrash concludes, "if VR can provide the right perceptual inputs, we can have whatever experiences we want, and those experiences will feel real—they'll be genuine experiences" (para. 27). In other words, Abrash presents an ontological frame that constructs VR as natural as any other reality by equating the mediation of a headset with the mediation of human sensory perception. It is a view that presents bodies as input/output devices akin to computers, and presents both as processors of the same 'data.' If the 'data' that the body currently processes is flawed—if the human input/output device is faulty—technology offers a way to supplant and extend its ability to process data.

These notions are not specific to a single company, suggesting both a purpose and a broader corporate applicability for these frames. At the Google I/O conference in 2017 (I/O refers to input/output, taking on wider meaning in these conceptualizations), Clay Bavor's description of a VR experience offers a clear statement of intent linking an ontology of worlds and bodies as data, with an epistemology in which knowledge is acquired when that data is collected and commodified:

> What's happening here now, for those of you who are deep into VR you know what this is about, it's presence. Presence is the VR jargon for that feeling that you're really somewhere else. And it happens when all of your different senses, sight, sound, how you're moving your body, proprioception, your vestibular system, all line up and agree, and your brain just says, "Yep, I'm there." And that's how VR can make you feel, like you're experiencing something directly. And now, that's pretty important to us at Google. That's because we've always cared about information. Organizing it, making it useful and accessible. But people think of information is like numbers and words, sentences and

> so on, but experience in many cases is the most direct form of information. (Google Developers, 2016a, 2:18)

Bavor adopts the ontology that understands 'presence' as an automatic (i.e., natural) experience ('Your brain just says, "Yep, I'm there"') after a technological substitution of 'all your different senses.' His epistemology is evident in his characterization of 'experience' (i.e., all sensory perception) as information, something that 'people' still think is 'numbers and words.' As with other frames, there is audience building here, too. This unspecified reference to 'people' suggests a separate group with a passé view of the world, unlike those who understand VR and 'experiences' as the 'most direct form of information.' A belief in these constructions is presented as integral to a belief in VR.

In order to better understand the implications of these constructions, the work of Michael Madary and Thomas Metzinger (2016) is a possible starting point, since their examination of the ethics of VR is based on a similar philosophical framework[38]:

> What is historically new, and what creates not only novel psychological risks but also entirely new ethical and legal dimensions, is that *one* VR gets ever more deeply embedded into *another* VR: the conscious mind of human beings, which has evolved under very specific conditions and over millions of years, now gets causally coupled and informationally woven into technical systems for representing possible realities. (p. 20)

[38] The paper relies on Metzinger's philosophy of the self, which would require a more nuanced discussion than is possible here, but the processual consciousness in Metzinger is aligned with conceptions of VR that focus on the plasticity of the human mind. (Note also that Mel Slater is a frequent collaborator and participated in the discussions that resulted in the paper.)

Yet even if Abrash (2017) or Bavor (Google Developers, 2016) or Madary and Metzinger (2016) are talking about a future VR that is so complete that it is invisible, it is still a mediation. Whether or not the mediating apparatus is perceived, one reality is technologically replaced with another. Drawing on Barad (2007), this claim of nonmediation is necessarily political: a VR headset, with its corporate contingencies and its virtual worlds, provides evidence of the boundaries it attempts to define. The 'genuine' experiences that Abrash endorses, for example, are contingent on Facebook and membership via mediation in a global, technological ecosystem.

For developers and consumers, that membership entails an effort to normalize the collection of personal data, and an effort to create the tools to better acquire that data. In a three-minute recruitment video for Oculus Research, Abrash and a series of smiling researchers tell the viewer that they are solving problems of the future, but that they are not allowed to say what those problems are. Before cutting back to the researchers, Abrash says to the camera, "If you want to solve the hardest problems and invent the future, Oculus Research is the place to be" (Oculus, 2018c, 00:24). In broad terms, Abrash (2017) has outlined what this research will entail, including facial tracking, eye tracking, and body tracking, requiring "research in areas ranging from computational optics to material science to sensor technology and much more" (Abrash, 2017, para. 40). Technology journalists have raised concerns about these possibilities, noting that privacy policies at Facebook and Oculus are vague about how this data will be kept and used (Bye, 2017; Robertson, 2018). Given that industry leaders do not clarify these factors, discussions about the ethical use of these tools is discursively framed as less important. And yet the research that corporations gain, that VR 'requires,' has wide-ranging applications, including those for government surveillance and the military, as suggested by Palmer Luckey's transition from Oculus to Facebook to Anduril, a company intent on acquiring defence contracts with the

United States government (Levy, 2018). Although VR is promoted as a social panacea, as an apparatus that will bring the world together, these are not the 'hard problems' that Abrash and his recruits hope to solve.

As presentations to (statistically young, white, male, cisgender, able-bodied, etc.) developers, the audiences at these talks are demographically akin to the engineers at the Global Challenges Summit for whom Abrash (2017) employs the colonial language of 'new frontiers' that are 'waiting to be explored.' As discussed in Chapter 3, this framing suggests a call to action and a promise of discovery. If for users it represents the experiential colonization of distant bodies and environments and/or the ability to cast those bodies aside, for developers it is the colonization of bodies through new methods of data gathering and surveillance. When Abrash (2016) was welcomed on stage at Oculus Connect 3[39] for a keynote titled, 'The Future's so Bright, I gotta wear a Rift,' the chorus of Timbuk3's *The Future's so Bright, I Gotta Wear Shades* played as he entered. The 'peeping-tom techie' line that precedes one of the song's verses was not included, but it would have been apt. Like Zuckerberg 'seeing' hurricane Maria in VR, these are the colonial workings of a Foucauldian biopower: Western, white, heterosexual, able-bodied men enacting hegemonic control over places and bodies, live-streaming the workings of a social order with a 'new' technology and suggesting that this technology offers emancipation.

Within the frames presented by industry leaders and corporations, it is exciting and necessary to solve the 'hard' problem of applying tracking technologies, or the 'hard' problem of collecting an ever-increasing amount of user data. The raced, classed, gendered, and ableist

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[39] Abrash (2016) tells the story of reading *Snow Crash* and meeting Carmack at this talk, too. The book contributed to the 'sudden insight' that VR would be possible. In this telling, as Carmack spoke to him, "his vision resonated with *Snow Crash* in my mind and I could actually feel the shape of the future emerging" (04:35).

connotations of these pursuits are overlooked. If the technological ecosystem in which VR operates already tracks an abundance of user data, an ontology of technological appropriation and substitution helps to inform an epistemology in which corporations can expand the data that they collect. An epistemology in which the world and bodies are understood as data suggests (at least) two forms of capitalization. Corporations capitalize on the mediated body by expanding the range of data that is collected from individuals and capitalize on developers by leveraging their excitement for VR into research for the 'future.' Here, again, VR is an apparatus within a new political context: a tool to draw in corporate developers and researchers; a tool to draw in users, bodies, data; and a tool to normalize visualizing technologies.

Conclusion

As presented by industry leaders, the promise of VR is the promise of embodied transformation by technological substitution, of mediation while claiming non-mediation, of hegemonic control and surveillance as the price of personal connection. In their promotion of VR, industry leaders and corporations have adopted an ontological and epistemological foundation which requires an ever-increasing collection of data. VR is framed to offer the 'natural' gaze of a personal panopticon, a personal technology to normalize the disciplining and regulating effects of corporate power. It is a technology to make that power efficient, to increase the production of bodies made visible through data. For Foucault (1995), the panopticon was the disciplining force of modern society in its perpetual regulation of bodies, an 'interrogation without end,' which was a contrast to the older punishment of the 'infinite segmentation' of bodies (p. 227). With the ontology and epistemology adopted by corporations, VR offers both. In VR, bodies are literally and figuratively objectified. VR as panopticon is the promotion of an

'invisible' subjugating machine, an effort to normalize the corporate collection of data, an apparatus to reproduce unequal relations.

Like Donna Haraway's (1988) critique of scientific objectivity and its 'conquering gaze from nowhere,' the mediated gazing upon mediated bodies raises questions of power and control, of surveillance, of representation, of data, of bodies. For Haraway, this gaze relies on the ontological and epistemological constructions of 'visualizing technologies' that subjugate and appropriate while claiming innocence and transcendence. As the language of VR scholarship is co-opted by industry to frame 'transcendent' technologies, critiques of these claims become more urgent: "It is dangerous to succumb to the myth of transcendence, for it is in such rhetoric of immanence and political innocence that we are bound, ethically, to locate the workings of society's power structures" (Irom, 2018, p. 4287). To downplay the social construction of a technology, its corporate contingencies, and its represented worlds, is also to downplay its omissions: the omitted sociality and physicality of virtual worlds, the omitted construction of represented lives, the omitted voices of dissension.

One intervention within this space is to advocate for additions. An addition could be as simple as a clarifying word. When an industry leader like Clay Bavor speaks of 'we,' and 'our,' he means Google, not the public. At the 2017 Google I/O conference, Bavor stated:

> If you think about moving from punch cards to the command-line, to the GUI, to touchscreens, with every progression we became more able or capable with our computers. And we think VR and AR will push this even further. They open up access to an entirely new kind of information, a kind of experiential information, or information that's anchored physically, to the real world. We think this progression is going to be powerful. (Google Developers, 2017, 02:28)

With a clarifying word, it is Google that becomes ‘more able or more capable’; it is Google that gains ‘access to an entirely new kind of information’; it is Google, in competition with Facebook, that thinks this ‘progression’ is ‘powerful.’ To advocate for additions, for clarifications, is to advocate for bodies, for senses, for politics, for social worlds. Such additions help to elucidate future work, in which the promise of VR comes into contact with the situated realities of lives that extend beyond the imagined transformation of a privileged few. Each of these additions help to complicate an ontology that equates corporate and reductionist simulacra with lived realities. Each of these additions help to challenge an epistemology that frames bodies as bits.

Conclusion - The Possible Realities of VR

> Even if perceived "authorities" writing about a group to which they do not belong and/or over which they wield power, are progressive, caring, and right-on in every way, as long as their authority is constituted by either the absence of the voices of the individuals whose experiences they seek to address, or the dismissal of those voices as unimportant, the subject-object dichotomy is maintained and domination is reinforced.
>
> —bell hooks, *Talking Back: Thinking Feminist, Thinking Black*

Limitations and Contributions

I have argued that an examination of the discourse of industry leaders is important to better understand how power is maintained and enacted, to deconstruct the future-oriented claims of contemporary VR, and to build new understandings that may help to reframe and reconstruct historical narratives that erase and exclude. My analysis is necessarily limited. An examination of the discourse of those who represent exclusive positions of power, and interpreted by someone who shares many of their traits, should act as yet another reminder of who is or is not represented within discussions of contemporary VR. I have tried to take care when quoting from or speaking about people with marginalized identities, but much more work needs to be done to highlight, promote, and listen to their various perspectives. This is true in general, but especially in relation to the concerns I raise with regard to VR and the technology sector more broadly. Future work can respond to the exclusion of the tech industry by more directly highlighting the voices of those who are not represented, and by demanding and demonstrating actionable change within the tech sector. In this final chapter, I will briefly summarize the contributions of this dissertation, illustrating how the contributions and perspectives of this work can be applied to recent developments in the sector. Because of the partial perspective of this work, I then discuss possible interventions that range from the micro to the macro, from my own design work within

a university context, to the need for collective coalition building within a tech sector that has much to learn from feminist theory and practice.

The overarching contribution of this dissertation is an analysis of industry-led discourse that situates and draws attention to the politics of contemporary VR. As I outline in Chapter 1, this functions as a call for more interdisciplinary work, not only across fields that speak to communication and culture within media studies, but also across fields that must contend with industry-led promotion and production of new technologies, whether it be education or human-computer interaction. As one example of this interdisciplinary theory-building, in Chapter 1, I propose that games studies and documentary film studies—two disciplines that examine separate areas of media production—can learn from each other as they both encounter the use and promotion of VR. As such, this dissertation also offers a contribution to both fields: to documentary studies, I offer a response to the call to examine the 'enmeshedness' of VR within wider sociopolitical contexts (Rose, 2018b); to games studies, I offer a pre-emptive and preliminary foundation to bolster VR games research by situating VR within the masculinist and misogynist cultures of game development. I extend these considerations in Chapter 2 by outlining the theoretical foundations of technofeminist scholarship, applying their analyses of power within networks to expand the analytical purview of VR research: VR is always already political, and its corporate domains of influence are not limited to a single discipline.

Examining how the politics of VR connect to the interests of industry leaders and multinational corporations, Chapters 3, 4, and 5 offer the core contributions of this dissertation. In these chapters, I describe a facet of contemporary VR that has received little attention in recent scholarship: the role industry leaders play in shaping VR discourse, and the politics of their claims. Chapter 3 outlines some of the key tropes used by industry leaders to frame VR,

including presumptions of newness, of (white) pioneers, and of diversity and inclusion. Crucially, each of these frames operate in tandem, creating an imagined historical trajectory: boosting the reputation of a privileged few while projecting a vision of social emancipation through technological connection. Because frames limit, because they only show part of the image, the chapter ends with a brief reframing, reinserting some of the troubling complexity that is left out of the contemporary narrative of VR. Chapter 4 works to re-contextualize the myth of the white pioneer innovators by offering a case study of Palmer Luckey. This chapter contributes a crucial link between industry leaders' discourse and games, in which VR is framed as a games platform by promising technological—rather than social—change despite a culture beleaguered by sexism, racism, and other forms of exclusion. Within this context, the discourse of 'progress' only serves to transfer an exclusionary status quo from one platform to another.

To chart Palmer Luckey's trajectory from Oculus to Anduril is also to chart the closing of a particular loop: a military technology becoming militarized again,[40] demonstrating some of the broader ramifications of corporate ambitions for VR. This sets the stage for the contribution of Chapter 5, in which I disentangle some of the ontological and epistemological foundations of industry leaders' discourse. This discourse involves a co-opting of language, shifting power from the academy to industry in its capacity to define the terms through which VR is conceptualized and understood. I contend that this gives industry the ability to normalize an extension of their data gathering programs, raising concerns that reach far beyond VR alone. Employing the theoretical foundations outlined earlier in the dissertation, the chapter develops an account of

[40] More accurately, VR has never stopped being militarized. Some of Luckey's original efforts developing his headset were at the Institute for Creative Technologies at the University of Southern California, a lab which got its start with funding from the US Army (Robertson, 2015).

how and why VR is so important to companies like Facebook and Google, presenting a more networked interpretation of the reach and consequences of contemporary VR.

Throughout this research I have also come across a number of questions that I was not able to address, but that illustrate the depth of the problem as well as possible avenues of future research. For example, the unequal relationships that I describe may intensify the digital divide (UNHRC, 2017). A general lack of access to the platform is compounded by such factors as the prohibitive cost of VR, explicit recommendations against the use of VR for the elderly (e.g., HTC Vive, 2018), as well as conflicting guidelines and a lack of data addressing the safety of VR for children (Gent, 2016). Inconsistencies in the promotion of VR headsets have led to contradictions in use: while Oculus warns against the use of its headsets for children under 13 (Oculus, 2016b), Google promotes its VR 'expeditions' for children in the global south (e.g., Vishwanath, Kam, and Kumar, 2017), advanced with the same uncritical enthusiasm that endorses the use of VR in education (e.g., Caton, 2017). This can also act as a reminder that although I focus on North American discourse, the promotion of VR is a global endeavour. Similarly, while I highlight concerns about privacy and data gathering, how these concerns will apply to law and policy in different countries is an open question. For example, while major wireless service providers in Canada support VR, they have "not fully considered the privacy requirements for such technologies" (CRTC, 2017, p. 4). Yet another avenue for future research is an analysis of content, perhaps including the embodied connotations of the actions required, or degrees of spectatorship (see Golding, 2019), as well as other factors outlined by Kennedy and Atkinson (2018) across their six categories of analysis. Other recent uses of VR hint at other domains that stand to offer important insights, including social media studies and education

studies, subjects that are beyond the scope of this dissertation, but that further demonstrate the interdisciplinary perspective that a study of VR requires.

What makes the contributions of this dissertation timely is that the issues that I describe—e.g., the racial and gendered power dynamics in the tech sector, the exclusionary rhetoric, or the dangers of worlds and bodies understood as data—are showing no signs of abating. Confrontations between the idealized image of the tech industry and the realities of its applications are becoming increasingly evident. The past two years alone have seen protests by employees about the militarization of technology at Microsoft (Schneider and Sydell, 2019) and Google (Deahl, 2018), as well as walkouts protesting sexual harassment and discrimination at Google across the company's international offices (Weaver et al., 2018) and at Riot Games in Los Angeles (Farokmanesh, 2019). These and other examples are being linked to a wider 'tech worker unrest' (Tiku, 2018), but it could be premature to assume that these sentiments of unrest are representative of the tech sector more generally. Instead, the sexual harassment protests at Google have led to further allegations of backlash (Campbell, 2019) and antimilitarism has been critiqued from within the tech sector by Anduril Industries. Its leadership, including Palmer Luckey, claims that the contracts between the military and technology companies are a necessity against similar efforts in Russia and China (Luckey and Stephens, 2018). After protests, military projects do not disappear; they change hands. Anduril Industries won part of the Project Maven contract that was protested at Google (Fang, 2019) as well as a contract to 'modernize' the Royal Marines in the UK (Liptak, 2019).

The range and prevalence of these issues may also suggest that the theoretical contributions of this dissertation could offer a lens to examine recent (and troubling) 'advances' with consequences that extend beyond VR alone. For example, reporting on a talk at GDC, Scott

Hayden (2019a) describes a talk by an experimental psychologist at Valve, Dr. Mike Ambinder, who claims that brain-computer interfaces can one day be built into VR and AR headsets in order to collect information in real time, reportedly to determine such factors as "whether a player is happy, sad, frustrated, bored, focused, distracted, etc. … and build systems to leverage this data" (Hayden, 2019a, para 3). If this represents an 'advance' in what data is collected from bodies, consider another 'advance' in what data is collected from environments. Reporting on the most recent Oculus Connect industry conference, Ben Lang (2019b) describes Facebook's plans to leverage the always-on cameras of what they hope will be ubiquitous smartphones and AR glasses to create persistent, real-time digital representations of environments. Lang writes, "Facebook is calling it LiveMaps, and says it will be a 'multi-layer representation of the world,' and one which will crowdsource data from connected devices in real time to provide a constantly updated picture of the real world" (Lang, 2019b, para 4). In other words, what brain-computer interfaces aim to do to the body, LiveMaps will do to environments: expand what data is collected by framing everything as data. Moreover, Lang and Hayden have written pieces that could complement and expand each other's reports. Hayden (2019b) has written about Microsoft's research to track and analyze real-time environment data in order to overlay virtual environments, while Lang (2019a) has written about the nebulous language that Oculus uses in relation to the data captured by the always-on cameras of current headsets.

Taken together, these accounts detail efforts to render bodies and worlds into data, and to render all devices into persistent data gathering machines. These examples demonstrate that there is an ongoing need to examine and critique how companies and industry leaders envision the future of these technologies. As I have argued in this dissertation, the tech industry's interest in VR contributes to an ontological conceptualization of bodies and environments as data—

extending corporate control over how that data is tracked, commodified, and sold. The contemporary contexts of VR establish a frame through which this kind of increased data collection is normalized, and made to seem necessary. These ongoing challenges across the tech industry point to the need to develop both small- and large-scale interventions. The final two sections are an attempt to outline opportunities for change.

An Intervention on a Medium

In 2016, I turned my attention to VR in my narrative design work, initially interested in examining the storytelling potential of the medium. This work is informed by the field of tangible, embedded and embodied interaction, a subfield of human-computer interaction (HCI) that attempts to recentre the focus of interaction research on physical bodies and environments. My design work examines how to better incorporate the body in interactive stories and storytelling, which I also see as an opportunity to challenge existing structures that discount or disregard the body. For example, in one project, we[41] created a prototype museum experience around a 16th century artifact that offers interactive 3D-printed replicas, soundscapes, projected displays, and text, as well as examples of the perfumed scents that were once placed inside the object (Harley et al., 2016). We present the work as an alternative to the traditional setting of museums, in which historical artifacts are often behind glass, and the sensory qualities of the artifacts are reduced to textual descriptions. The artifact is present, but any physical understanding of its context of use is absent. Since it is impossible for museum visitors to actually handle the original artifacts, we argue that physical-digital replicas that remediate the

[41] Throughout this section, I will use 'we' or 'the design team' to refer to and to reflect the collaborative decision-making on these projects. Note, however, that each project is comprised of a different team. I was the team lead and first author for each of the VR projects, but not the museum projects.

artifact's properties can be presented alongside more traditional exhibits to offer some physical understanding of how these objects were once used. From museum-based projects, I transitioned to VR. I saw a parallel in the reliance on the visual, on experiences that promote a problematic (and unnecessary) turn away from the body and from situated contexts, prioritizing a particular model of experience: look, but do not touch. In this section, I discuss three VR projects that we presented and published at conference proceedings (Harley et al., 2017; Harley et al., 2018; Harley et al., 2019). While these projects overlapped with the data collection and analysis that would become the core contribution of this dissertation, these projects were not conceived as a direct response to discursive frames mobilized by industry leaders. Instead, I saw the design work as an opportunity to question design trends and to propose alternatives in real-time. Within a design context that often appears to pursue normalization and standardization, our projects offer playful eccentricity and personalization. In reviewing this work here, I hope to demonstrate the incremental—but necessary—change that these kinds of design interventions can offer.

The projects began as part of a course at Ryerson University in the Faculty of Communication and Design, led by Dr. Ali Mazalek. In this course, undergraduate and graduate students from across Ryerson are asked to collaborate on an ongoing research project, learning primarily by doing. It is a hands-on process, and in my capacity as a research assistant, I lead and work alongside an interdisciplinary team of four to eight students at a time. Though it is only articulated as such in the last project, all three adopt particular elements of a research through design approach (Gaver, 2012; Zimmerman, Forlizzi, and Evenson, 2007), in which the goal is to examine the contours of a design space, and potentially to expand its boundaries. In William Gaver's (2012) words, it is a process through which designers might ask 'what might be' within a given design space; as such, it is a process that offers questions rather than answers:

> I suggest that the design research community should be wary of impulses towards convergence and standardisation, and instead take pride in its aptitude for exploring and speculating, particularising and diversifying, and - especially - its ability to manifest the results in the form of new, conceptually rich artefacts. (p. 937)

Within this context, the focus of these design projects is the prototype or proof of concept, a designed object that helps to communicate the choices of the designers with the goal of generative theory building. Anecdotally, I observed that many of the students working with me began this work because they were drawn to VR and to its discursive promises, to its perceived potential as a platform for storytelling (as I was), rather than an interest in the critical questions around VR. In this sense, VR—like the proofs of concept and prototypes more specifically—is a tool with which an educator can ask questions.

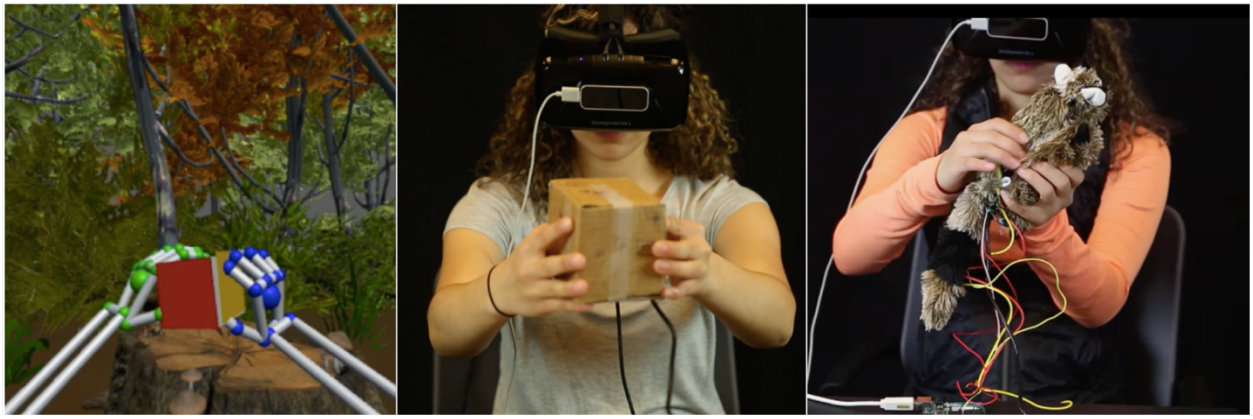
In developing these projects, I work with the design team to situate the project within the bounds of related work, identifying gaps by drawing together themes or approaches from across industry and academia. For each of the three projects I describe, I will use one example per project to illustrate how our design work operates as an intervention, showing how the prototypes and proofs of concept that we developed stand in contrast to other work from that time. In choosing one idea or designed object, my goal is not to specifically single out a paper or set of authors as *requiring* critique. Having done only small-scale design work, I am cognizant of the high level of effort on the part of those involved on a project—whether authors or not—as well as, in some cases, the unacknowledged arbitrariness of a particular decision in the face of what can problematically seem to matter more within an academic context: getting published. Instead, the work chosen here is mainly chosen because it can stand for a wider design trend. It is

the trend, cumulatively, rather than the individual work, that is a richer, more urgent site for intervention.

The first of our VR projects, 'Tangible VR: Diegetic Tangible Objects for Virtual Reality Narratives,' began in early 2016, the same year as the release of consumer VR. We worked primarily with the Oculus HDK2 (i.e., the second headset that Oculus prereleased to developers as a development kit). Although not supported by the HDK2, at the time of consumer release the primary means of interacting within VR was with dedicated handheld controllers. In the days leading up to my presentation of the paper in 2017, Microsoft Research had released information about a new prototype VR controller called CLAW, which I used in the presentation to illustrate how our work contrasts current work. In their paper, the creators of CLAW write, "we argue that *creating an effective VR/AR haptic controller device requires the design to be multi-purpose in nature*" (Choi et al., 2018, para. 1, original italics). Based on our own research, this statement represented the prevailing opinion of the time. Consumer headsets like the HTC Vive and the Oculus CV1 came with dedicated controllers. VR controllers are designed to be multipurpose in in order to facilitate a variety of interactions, feedback, and possible applications. What this implicitly means for the body—but specifically for the hands—is that any virtual object manipulation is mediated by the controller, which means that any sense of tactility is reduced to the feeling of the controller and its haptics. In other words, the controller reduces the complexity of the hand in order to generalize; in practice, it also specifies. For example, the CLAW has three main interaction modes, 'touching mode,' 'grasping mode,' and 'gun mode.' If the three main interactions are touch, grab, and shoot, what does that mean for bodies in VR? What does it assume about hands? What does it assume about what is generalizable, or multipurpose in VR?

In response to such questions, we designed two prototype interactions that offer specificity rather than generalizability. Set within a narrative context, the work relies on the notion of 'diegetic' objects, which is to say that the object exists within the world of the story, and thus its physical properties communicate something of that world. Put another way, the object is contextually situated. We wrote the outline of a story and designed two objects from that world, a 'magic' cube and a 'squirrel' (Figure 1). In the story, the squirrel tells the player that the song of the forest is trapped inside a cube, endangering the forest animals. By playing a musical game, which requires the player to interact with all six sides of the cube, the forest is saved. The squirrel is the player's friend and companion in the narrative and at one point is too scared to go on. The interaction requires the player to pet the squirrel to calm it down. As an interactive object, we gave the squirrel a specificity that would not be possible in a controller. Using a plush toy roughly the size of a squirrel, the object had soft (synthetic) fur; we added clay inside for weight, a wire frame for the feeling of a spine and a delicate skeleton, a servo motor to move its head, and a vibration motor to give it a heartbeat: fast when it is scared, and slow after the player pets its fur. Based on our design process and user test, we argued that there are unique benefits to the use of diegetic objects in VR, with physical properties when the object is held, and virtual properties when it is put down. We also suggested that the 'sensor unit' that we used to track the objects in VR could be used with any other object, meaning that players or designers could create custom objects for particular stories or uses. As an intervention, the project offered new questions for the design community. What happens when specificity is traded for generalizability? What happens when the complexity of physical interactions is made virtual? What is excluded when virtual worlds remain dominantly virtual?

Figure 1. Tangible VR



Note: The virtual scene with tracked hands and cube (left); one of the student collaborators interacting with the first prototype of the cube (middle); and with the squirrel (right).

The next year, we developed a project called, 'Sensory VR: Smelling, Touching, and Eating Virtual Reality.' Now working with the Gear VR headset (a smartphone-based headset, made by Samsung in partnership with Oculus) as well as the Oculus HDK2, our interest was the apparent increase in research and industry products designed to provide a 'sensory' experience in VR. For example, Ambiotherm proposed simulations of 'real-world conditions' by using fans attached to a VR headset as well as pads on the back of the user's neck (held in place with a strap around the user's throat) that would heat up or cool down (Ranasinghe et al., 2017). Later, the authors added a tube-like smell delivery mechanism to this system in a project called 'Season Traveler' (Ranasinghe et al., 2018).[42] Since these kinds of sensory experiences seemed limited—limited to the head and neck in this case, disregarding the rest of the body—we saw an opportunity to intervene on current conceptualizations of 'sensory' experiences for VR. As described in Chapter 5, embedded within such technological mediations, there was the

[42] These kinds of technological mediations appear in fictional representations of virtual interaction as well. The haptic suit in *Ready Player One* (Cline, 2011) is an example of sensory experiences and simulations that are not only mediated, but technologically-produced.

assumption that a physical reality could be reduced to a limited number of sensations and that it could disregard social and cultural factors. To counter such assumptions, we proposed that the non-digital offers low-cost opportunities for 'sensory' experiences in VR that are vastly more complex and personalizable than those currently available using technology.

We designed two proofs of concept to develop this argument. The first, was a moment at a beach, in which the player turns on a space heater, sits in a lawn chair, puts on sunscreen for its distinct smell, prepares a drink of choice, puts their feet into a plastic container of sand, puts on the headset for the visuals of the beach, and headphones for the sound of waves and the birds (Figure 2). Within this moment there is smell, sound, taste, touch, sight, the warmth of the heater, and that feeling of sitting in a deep lawn chair with your feet in the sand. As an intervention, this offered a consideration for the complexity of the real: there is no haptic feedback that is capable of simulating the complexity of sand underfoot. It was also a direct contrast to work that implicitly cast the player as a passive recipient of simulation, in which the player is simulated upon, rather than an active co-creator of an experience. Moreover, the 'experience' does not need to begin when the player first puts on the headset, and it does not need to end when they take it off. We took these considerations into our design of a second proof of concept that presented a single moment in Little Red Riding Hood, in which Red stops in the forest on her way to check in on her grandmother. By conceptualizing the experience as co-constructed and player-driven, the player could prepare a basket of food rather than interact with virtual food; rather than a simulation of the wind, or the simulated smell and embodied feeling of being outside, the player feels wind and is outside. The sensory qualities of one environment simulate the qualities of another. There is something both serious and tongue in cheek when designing these experiences, with images of players sitting in parks munching on Grandma's

bread, or sitting at home in lawn chairs with their feet in the sand. Yet against the norm of technologically-driven feedback, it is radical to imagine that the player might want to co-create an experience using the low-cost, at-hand materials and environments, choosing sensory modalities that best suit their needs and preferences. It can be radical to imagine that it might be the designer's responsibility to facilitate that kind of experience rather than mediate it entirely.

Figure 2. Sensory VR

Note. One of the authors of the paper putting her feet into the sand (left); the virtual scene for Little Red in the woods (middle); and a player eating Grandma's bread (right).

Although the paper for the third project, 'Mobile Realities: Designing for the Medium of Smartphone-VR,' presents the work from a design perspective, it may be clearer to present its intervention here as one on discourse. In 2018, after two years of consumer VR, and after numerous hardware and software products designed for VR, industry and journalist discourse continued to construct the medium as a monolith entity, as if all the headsets are the same. The numerous articles or statements that declare that 'VR will change the world' (e.g., Stein, 2015) would continue to conceptualize VR as a future-tense object that does not acknowledge the differences between headsets or experiences. In this construction, what will change the world is not the current 'state-of-the-art' in its clunky, uncomfortable, heavy, dizzying form, but some future VR that does not need to concern itself with the realities of today's headsets. Yet these headsets range in quality from 'low-end' smartphone-based headsets to 'high-end' headsets that

rely on computers that are capable of greater feats of tracking and representation. Moreover, Google's and Facebook's strategy to popularize VR relied on the relative ubiquity of mobile phones and the relative low-cost of headsets like Google Cardboard and Gear VR. When Google employees made their pronouncements of 'VR for everyone,' they were referring to smartphone-based headsets, but casting a wide (discursive) net for VR implies that the medium offers its promised transcendence no matter the form. Within this discursive erasure of differences in the types of VR, one taken-for-granted assumption is that the smartphone, when it is used for VR, is nothing more than a computer with a screen.

The design intervention of the project was to propose that smartphone-VR could be understood as a separate medium. One direct result of this conceptualization is that it deliberately calls attention to decades of storytelling with the smartphone and its related technologies, which is otherwise ignored or not applied when VR storytelling is framed as 'new.' Instead, a narrative for smartphone-VR could draw on the various media and technologies of a smartphone, including text messages, the camera, websites, AR, and GPS—as well as VR. An added benefit of this conceptualization is that even the Oculus health and safety warnings recommend limiting the duration of initial use and taking frequent breaks (Oculus, 2018a), which suggests that using other media is an opportunity to extend the story before and after the player puts on the headset. This, in turn, is also an opportunity to draw on a history of mobile storytelling to include real world locations.

Conceptualizing smartphone-VR in this way operates in contrast to the vast majority of consumer VR, as well as the messaging from companies that frames the smartphone as an 'accessible' display (i.e., cheaper than desktop-based VR, rather than a medium in its own right), or consumer VR as a purely domestic experience. The latter point is aptly illustrated in an

Oculus advertisement from the time, in which an actor looks out the window briefly, appearing to contemplate going outdoors, before turning back and choosing the virtual instead (Oculus, 2017b). For this idealized consumer, the outside is less compelling than VR. To give shape to and to ask further questions about the medium of smartphone-VR, we designed two iterations of a site-specific story using two locations in downtown Toronto using the smartphone camera, text messages, GPS, a website, audio narratives, AR, and VR (Figure 3). I will not go into the specifics of the stories or implementation here, but I will recap the final section of the paper. Reflecting on our use of these medium-specific qualities of smartphone-VR as well as the specificity of designing for real-world locations, we concluded with a discussion of some of the wider social, cultural and political contours of this kind of mediated storytelling.

Figure 3. Mobile Realities

Note. One of the authors of the paper testing the audio narrative and text messages (left); a story object that shows a clue (middle), which connects to the virtual representation of the real-world location (right).

Based on our design process and user test, we asserted that designing mediated encounters with real locations must find ways to acknowledge the politics of space, in part by including considerations for the lived realities of the city and its residents. For example, as we describe in the paper, the parks where our stories take place are near social services, and lived realities within those locations can speak to social and colonial geographies that are not communicated in the idealized forms of play proposed in our proofs of concept. Although our

remediation of space might foreground the player's agency, it can still lack appropriate considerations for non-participants. Such concerns are not new. As we discuss in the paper, Mary Flanagan (2007) raised many of the same concerns in response to the many location-based media projects of the early 2000s. Revisiting these ideas with our proofs of concept was an opportunity to question the use of media in public. Positioning our work as a first attempt in the design space of smartphone-VR allowed us to question current taken-for-granted assumptions of VR play. Who gets to play, how, and where? What are the possibilities of design that begins with considerations for diverse players, for accessibility, for safety? How does the current use of media in public influence the use of these media? How do these forms of play account for differing arrangements of power? Like the previous projects, the work offers more questions than answers. In the headlong rush to develop content, our work is an attempt to slow that process by asking what is left out, asking how we might offer alternate definitions and alternate considerations in order to continue questioning how VR is defined.

'Interrupted Imaginaries': Towards Critical Collectives

In my collaborative design work, I aim to show that interventions in the form of prototypes and proofs of concept offer a way to challenge the status quo of technology design while also employing that technology. Given that these projects were completed within the last three years, I have no evidence that this work, despite its dissemination in academic papers and international conferences, has made any impact on industry. However, I would suggest that it offers two key contributions to VR discourse. First, these prototypes and proofs of concept offer contemporaneous examples of 'dissenting' work. To reprise the language of Anne Stoler (2018), against the backdrop of the driving force of industry-led VR design, our work represents 'impossible alternatives' and 'interrupted imaginaries' (p. 23). Having been published and

presented, this work offers a record of attempts to outline another path, attempts to steer VR discourse back towards the realities of bodies and environments, however ineffectual that effort might prove to be on a larger scale. Second, given that this design work is created in collaboration with students in a university context, these efforts also offer pedagogical opportunities to raise questions about the politics of VR.

For example, in early 2017, I asked the students to test both the Oculus DK2 and another headset called OSVR HDK2, and to assess the pros and cons of using one headset over the other. Our lab had purchased the OSVR in 2016, because it was cheaper than consumer headsets while boasting of similar technical specifications, and also because OSVR stands for Open Source Virtual Reality, meaning that its hardware and software are open source. I warned the students that the last time I had set up the OSVR with the help of a more technologically-inclined lab member, it had taken us two four-hour sittings before finally getting it to work. Even then, the image was upside-down. Part of the problem was confusing or misleading documentation, as well as contradictory tips and opinions across various discussion boards. Nevertheless, the students were eager. There was significant enthusiasm for VR in 2017, and for our part, there was no expectation that these first headsets would be easy to use. Over the next few weeks, which included frustrating false starts with the OSVR, the students decided to settle on the Oculus DK2. I agreed that for our purposes and timeline this was the right choice, but it was an opportunity to discuss what we were giving up and what we were leaving behind. It was an opportunity to put our discussions about the politics of artifacts into practice. Choosing a corporation's development kit over an open source development kit, we were giving up some of our ability to hack, to modify, to make our own choices about how to use the technology in its entirety, rather than what is made available to us by the corporation. Comparing the two

headsets, the more efficient system is one that is streamlined, made 'easy-to-use' in order to meet the standards of the corporation. Even if the OSVR HDK2 has better resolution and is a newer headset than the Oculus DK2, and even if there is potentially more freedom in its possible uses, the difficulty of its use is enough of a barrier to choose the corporate tool, and to accept the corporation's streamlining. As a team, we discussed the devil's bargain of using this technology over another: what happens if we as designers or users accept the idea that efficiency is more valuable than our ability to have a voice? Simplicity is political. Efficiency is political.

Although our design work may be an 'impossible alternative,' this is not to say that such work is wholly unique. Over the past decade there has been a growing interest in 'critical' approaches to design both within HCI and video games. For example, Bardzell and Bardzell (2011) propose that feminist approaches will offer important critical perspectives to the field of HCI as it is "increasingly engaging with matters of social change that go beyond the immediate qualities of interaction" (p. 1). Noting that it was always already the case that HCI affected matters of social change (both intentionally and unintentionally), the call for feminist HCI occurred amidst other debates and considerations for 'critical design' (see e.g., Bardzell and Bardzell, 2013; DiSalvo, 2012; Dunne and Raby, 2011; Pierce et al., 2015). Mary Flanagan's (2009) 'critical play' for video games demonstrates a similar call within game design. Flanagan conceptualizes critical play as "characterized by a careful examination of social, cultural, political, or even personal themes that function as alternates to popular play spaces" (p. 261). For Flanagan, critical play is an attempt to develop strategies towards making the values embedded within games or their overarching structures more explicit, such as including reflexivity in the game design process and prompting designers to voice their goals and values throughout. In related work, Flanagan and Nissenbaum (2014) conceptualize the 'conscientious designer,'

noting that designers and players each bring their own collections of 'pre-existing value commitments' shaped by how they are "personally, politically, and culturally" situated (p. 15). Although there are important differences across 'critical' approaches—whether for HCI or for video games—these efforts demonstrate how a desire for alternatives requires an examination of the tools and contexts in which 'critical' work takes place.

Within an artistic context, there are also examples that parallel our attempts to extend the tangible and embodied potential of the medium, and which also begin to reveal some of the limitations of such 'alternatives.' In their analysis of VR content, Kennedy and Atkinson (2018) describe the physical and tactile experiences of *Draw Me Close* (Tannahill, 2017) and *The Cube* (Circa69, 2016), discussing some of the challenges of work attempting to expand current conceptualizations of VR design. As Kennedy and Atkinson (2018) point out, efforts such as these must compete within capitalist structures and may have difficulty scaling the experience beyond the context of theatrical events:

> The Cube project made use of the Oculus Rift to stage an experience that combined elements of theatre, film and games with tropes of detective fiction. It is hard to imagine at this early stage how these intense one on one highly interactive experiences could be 'scaled-up' and made more widely available but they clearly work to demonstrate the possibilities of the technology to provide immersive intimate collaborative performances which engender complex emotional connection. (p. 13)

If critical perspectives as well as design interventions are already taking place within these contexts, this notion of 'scalability' remains a problem. Larger technologically-enhanced theatrical experiences remain exclusive, both from the perspective of creators and audiences, and smaller interventions like ours, though relatively low-cost, have limited reach.

The similarities of these 'alternative' approaches across a variety of contexts—both in terms of design and the challenges to bring that work to wider audiences—suggest that there may be opportunities for future work to extend the scope and reach of design that intervenes on the status quo. For example, drawing on feminist work in games studies, expanding how VR is defined or understood as a medium could also examine the 'on the ground' realities of its use, whether from the perspective of organizing more inclusive spaces (e.g., Schoemann and Asad, 2018), or examining existing barriers to access within spaces that define particular forms of play (e.g., Taylor, Jenson and de Castell, 2009). Critical perspectives that ask questions about the social and political contexts of design offer an opportunity to address what Wajcman (2004) refers to as 'systematic absences': "[w]omen's systematic absence from the sites of observable conflict over the direction of technological developments is … as indicative of the mobilisation of gender interests as is the presence of other actors" (p. 149). The same can be said for other marginalized identities, whose systematic absence from VR production and design can be understood as the mobilization of exclusion. Developing critical perspectives in VR design is incomplete without a consideration for how and why marginalized communities use—or do not use—these technologies.

More broadly, feminist work indicates that one way forward within spaces of exclusion is to acknowledge the ways that these systems are oppressive, as well as the ways that those of us who participate in such spaces may be complicit in the maintenance of oppressive structures. In *Living a Feminist Life,* Sara Ahmed (2017) proposes that to live in the social world is to 'inhabit' the constructed, institutionalized norms of societies. Referring to the dominating influence of white men as a system, as an institution, Ahmed contends that it is important to pay attention "not only to what has already been instituted or built but the mechanisms that ensure the

persistence of that structure" (p. 153). Based on the findings of this dissertation, this is an apt characterization of the taken-for-granted norms and practices of contemporary VR—a white, male-dominated institution, built and maintained. If exclusionary practices are normalized, they can be difficult to see, let alone to change. As bell hooks argues (2013b), it is possible to be unconsciously complicit with the hegemonic status quo, unintentionally colluding with the hegemony in both thought and action (see e.g., p. 4, p. 179). Applied to VR, although designing 'alternatives' remains necessary as a mode of resistance and intervention, it is also necessary to consider how these design practices might successfully avoid 'unintentionally colluding' with a discriminatory status quo, and how the work might strive to provide replicable, emancipatory practices. With these goals in mind, future work could seek to examine how design that uses corporate tools, that operates within corporate structures, or that otherwise benefits the corporation—e.g., by providing corporations with new content, new labour, and new data—can still be geared toward emancipatory change.

Such efforts could learn from critiques of institutionalized diversity initiatives, which similarly operate within broader power structures. In Chapter 3, I argued that part of the failure of the diversity initiatives at Oculus was that they lacked significant funding and were not integrated into the company as a whole. While increased visibility and representation is an important first step in this context (as Shana Bryant [2016] and others argue), these efforts remain insufficient if not taken up by the majority. Moreover, it continues to be important to reiterate that contesting oppressive systems (whether from the inside or out) is often difficult and unpaid work, and can include a great deal of emotional labour. Not only is this work daunting, but if the existence of diversity initiatives serves only the perception of change, efforts to enact wider structural change can be ignored or deemed unnecessary (Ahmed, 2017, hooks, 2013b). A

related concern is that attempts to make change that overemphasize individual action can also depoliticize and devalue collective action[43] by effacing or disregarding the power of the institution (Collins, 2019). Recalling Haraway's (2016) call to 'cultivate the capacity to respond' and to 'cultivate response-ability,' there continues to be a need to cultivate collective, collaborative practices that help to counter oppressive, institutionalized norms.

Research and design that seeks to foster collective action across VR production, design, and use, might look to what Collins (2019) calls a pragmatic coalitional politics. According to Collins, collective coalition-building must find ways to counter embedded hierarchies that reinforce privilege and power, employing a 'flexible solidarity' in order to acknowledge and support different paths towards the same ultimate social ideal. If, as Collins asserts, power can be understood as overarching 'matrices of domination,' which are (re)articulated to varying degrees across structural, cultural, disciplinary and interpersonal 'domains of power,' the ability to effectively challenge these systems of power requires critical and pragmatic strategies put forward by communities that are in opposition to these structures. Following this logic, if the majority of those already participating in VR discourse and production (including myself) represent power and privilege in some form, it is not enough to simply call for participatory democracy, or to attempt to shape inclusivity in this sector without acknowledging, supporting,

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[43] Elsewhere in the article, Collins draws on Vivian May to comment on 'intersectionality backlash,' in which the diverse coalitions of marginalized people, whose voices were integral to the theorization of intersectionality, are discounted in favour of individuals deemed more 'appealing':

> Revisionist narratives of intersectionality aim to erase the ideas and actions of Black women, Latinas, poor people, LGBTQ people and similarly subordinated groups from intersectionality's legitimate narrative, arguing that the visibility of these groups within intersectionality erodes its universal appeal. (2019, p. 168)

Collins argues that such efforts serve to depoliticize the *collective* contributions of marginalized groups in theory and practice.

and creating critical communities of practice that are rooted in intersectional perspectives and a common desire for structural change.

Throughout this dissertation, I have repeatedly commented on the ways that VR is not new. Neither are these strategies to counteract the power and politics of institutional norms. Committing to working with new technologies, striving to improve them, to make changes, to propose alternatives and interventions, to disrupt the power and control that these technologies represent, must be from the ground up. Collins (2015) contends that critical praxis advances the discourse from 'about' to 'with' and 'for': it is fundamentally a critical social justice project and it is inherently political. Creating new critical alternatives for VR will require communities of practice that demonstrate opportunities for change. It must be a collective effort, both from the perspective of creation and consumption. As hooks (1995) argues in relation to film and mass media, "Without an organized resistance movement that focuses on the role of mass media in the perpetuation and maintenance of white supremacy, nothing will change" (p. 118). Just as inequalities are embedded within technology by design, efforts to seek change through coalitional politics must also be embedded within theory and practice by design.

'Defying' Reality

In a recent advertisement for the Oculus Quest (Oculus, 2019b), a diverse cast of people put on the headset to play tennis, shoot guns, box, wave at an adventurous mouse, and swing a lightsaber. Over these scenes, the voiceover says:

> Reality doesn't believe in the impossible. It doesn't believe in moving without limits, or breaking the laws of physics. Reality will never let you enter a magical realm, will never let you stop time, or wield a lightsaber. But that doesn't mean you can't. You can have

> more than one body. You can have more than one world to explore. Because reality is yours to defy. (00:09)

Though I have tried many VR 'experiences,' I have not tried these, and like any discussion of a medium, analyses of content will be integral to a critical understanding of VR. I have attempted to lay the groundwork for further analysis by focusing on the networks that make particular kinds of content possible, i.e., how corporations create the necessary conditions for the production of content, and some of the possible implications of their design. Within the context of my work, the notion that 'reality is yours to defy,' however compelling or desirable it may be for the player, however saleable it may be as a book title (Ewalt, 2018), it is also an apt characterization of the perspective of industry leaders who seek to own and shape the reality of VR. It is their material and discursive efforts that defy the evidence of the detrimental effects of the medium by shipping headsets, that defy calls for regulation and privacy by increasing the data they collect, and that defy the evidence of discrimination and exclusion within the industry with the contention that this medium offers change. Each of these is a reality of contemporary VR.

"Nowadays," wrote Judy Wajcman, "it is the rapidly evolving information and communication technologies that are experienced as magic, and evoke dreams and desires about the future" (Wajcman, 2004, p. 1). VR is only one of the latest iterations of this kind of magic. When VR ceases to be framed as a hopeful, emancipatory dream, another technology will take its place. It is not the 'last medium' as Chris Milk or Palmer Luckey or any other enthusiast might contend. There continues to be an opportunity to reframe the imaginaries embedded within such dreams. Rather than characterize VR as the 'last' medium for its unmediated access to our emotions or because of some other presumption, there are many other hopeful, idealist alternatives. In an effort to reframe the 'dreams and desires about the future' that cast VR as the

‘last medium,’ future work can ask: how might VR become the last medium to extend the discrimination and unequal access to technologies, or the last medium to capitalize on bodies and worlds as commodifiable data, or the last medium to promote the racialized empathy of marginalized bodies, or the last medium to be used for military advancement? Or, more simply, how might VR become the last medium to be used as a tool that extends a discriminatory status quo? While VR is not, and will not be the last medium for any of these realities, if the norms of the tech sector are replicated and co-constituted by society, the interventions must also be replicable. There are opportunities to reframe these futures for VR.

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