

**3 MINUTES TO MIDNIGHT:
SPECULATIVE GAME DESIGN FOR NUCLEAR DISARMAMENT**

by

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ABSTRACT

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This paper proposes a digital game concept designed to increase the millennial generation's level of engagement with the campaign for nuclear disarmament. It discusses four key research findings that support the need for the development of this game, and provides helpful information to enable better understanding of the relatively specialized inspiring concepts. The paper argues that activist campaigns should design nuanced communication plans that consider the complexities of the issue and leverage the digital media tools whose affordances best match the goals of the campaign. In the case of nuclear disarmament, I propose a campaign communication strategy in the form of a pervasive social impact game, called *3 Minutes to Midnight*, as an effective way to ignite widespread public support in the 21st century.

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TABLE OF CONTENTS

Author's Declaration	ii
Abstract	iii
Acknowledgements	iv
List of Figures	vii
Introduction	1
<i>Prologue</i>	1
<i>'Aha!' Moment</i>	2
<i>Generational Literacy Gaps</i>	4
Chapter 1 - Methodology	8
<i>Speculative Design</i>	8
<i>Research Methods / Creative Process</i>	9
Ethnographic Field Observation	10
Professional Presentations	10
Documentary Analysis	11
Case Studies	11
Literature Review	12
Chapter 2 – Pop Culture & Nuclear Disaster	13
<i>Millennials & Nuclear Weapons 'Hyperreality'</i>	13
Contemporary Media Analysis: The 100	13
Historic Media Analysis: The War Game	15
The Sociocultural Link	15
<i>Disarmament Participation & Pop Culture Correlations</i>	17
Chapter 3 – Communication Breakdown	20
<i>The Best Problem to Have</i>	20
<i>'The Medium is the Message'</i>	22
<i>Ubiquitous Computing: A Communication Revolution?</i>	24
<i>Campaign Communications Using Social Technologies</i>	27
Ice Bucket Challenge	28
Kony 2012	28

Chapter 4 – Games and Play	31
<i>Serious Games</i>	31
<i>Pervasive Games</i>	32
<i>Social Impact Games</i>	33
Gamers, Idle Social Warriors?	35
A Medium of Their Own	36
Theorizing 3MtM Game Design	38
<i>Powers, Potentials and Permissions of Play</i>	39
Conclusion	40
Appendix A	41
Appendix B	46
References	47

LIST OF FIGURES

Figure 1	Approximated participation in anti-nuclear movement worldwide	18
Figure 2	Popular culture films featuring nuclear weapons worldwide by decade	18
Figure 3	Number of monthly active Facebook users worldwide	25
Figure 4	Number of Internet users per year worldwide	25
Figure 5	Examples of Internet memes in response to KONY 2012 campaign	30

INTRODUCTION

Prologue

The universally recognized Doomsday Clock, created by the Bulletin of the Atomic Scientists, symbolizes how close we are to destroying ourselves with dangerous technologies of our own making, the most ominous being nuclear weapons. In 2016, the Clock is set at three minutes to midnight – the closest human civilization has been to atomic disaster since the height of the Cold War.

As the most destructive technology in the history of humankind, nuclear weapons have the capacity to destroy all complex forms of life on Earth. Today, nine countries are known to possess approximately 17,000 nuclear weapons; more seek to attain them. The US and Russia each have approximately 1,600 on “high alert”, meaning they can be launched within 15 minutes of receiving a Presidential command. Current nuclear weapons are 30 to 330 times more destructive than the atomic bomb that killed 140,000 people in Hiroshima on August 6th, 1945. Nuclear weapons systems are also now vulnerable to hacking.

In our highly unstable geopolitical climate, it is not just state-sanctioned war and military accidents looming over us – nuclear terrorism is a threat, and an urgent one. NATO’s largest stockpile of nuclear weapons is held in a storage facility in Turkey, just hours north of ISIS-occupied territory.

The 'nuclear deterrence' argument no longer holds true in the complexities of today's international relations; it was a temporary answer to a permanent threat. Nuclear disarmament and abolition is the only known way to secure our global survival.

But the desperate warnings of alarmed military leaders, scientists, and doctors seem to be falling on deaf ears of an entire generation. Or perhaps their warnings are being sent through the wrong channels...

‘Aha!’ Moment

As a master of digital media student I get a lot of emails offering ‘opportunities’ in my university email. I let them accumulate, and every so often when I feel inspired I open them, take a quick peek, and feel like a productive member of society: *I have lowered my email inbox count*. In one such routine-scan around late November 2015, a particular ‘opportunity’ caught my eye – a game design contest about nuclear disarmament with a prize of \$10,000. No coding was needed, no previous design experience, just the idea.

My dad had always been into nuclear disarmament, and he had recently become a board member for a nuclear public health group, so I forwarded him the email and suggested we submit a game design together. A few days later he presented me an outline of the proposed game design. It was awful.

“The whole point of the game will be frustration,” he told me enthusiastically. “Players will think they have made an advance, and then just like that, out of nowhere, all their progress will be reversed by some unexplained political move! Or, the people in the game who hold the most valuable knowledge about nuclear disarmament grow old, lose steam, and die! Basically, players of the game will experience what it’s like for the people carrying the nuclear disarmament movement today, trying to keep it alive when nobody seems to care.”

“Dad,” I replied. “I really like how you’re trying to bring a sense of ‘authenticity’ to the design, but... people play games to feel good. Why would anyone want to play that game? It sounds so ... depressing.” I told him to let me think about it for a few days. I’d figure something out.

3 Minutes to Midnight (3MtM) was my team’s third game idea for the competition put on by N-Square and Games for Change (see original game concept document in Appendix A)¹. In addition to my British physician father, Jonathan Down, and me, a young Canadian

¹ NSquare is a 3-year initiative to find creative approaches to nuclear disarmament. Games for Change is a NYC-based game development organization that runs the leading annual social impact games conference.

academic and creative strategist, the team included my technically-gifted Israeli friend and colleague, Eyal Assaf.

The *3MtM* concept emerged one day while Eyal and I, both masters students at the time, were sitting in a common area working on game designs for the competition. Our nearby classmates were intrigued by the intensity of our conversation, so they came over to ask us what we were working on. We told them about some shocking yet basic information about nuclear weapons threat and the Doomsday Clock. They could hardly believe us; they had never heard any of this information before.

After the initial shock wore off, our colleagues, mostly in their early to mid twenties, pulled out their phones and their laptops. They started texting friends to ask if they knew about this nuclear weapons situation. How was it possible *not to know* about this? The fact that such global nuclear weapons insanity exists and they didn't know about it disturbed them, offended them to a degree. So they pulled out their mobile phones and logged onto their social media, and took to their personal soapboxes. They asked us for recommendations for articles to post on Facebook so more people could get informed about nuclear weapons immediately. After only brief exposure to trusted information, these university students wanted to take action for nuclear disarmament in the most immediate way they knew how – posting to social media.

This became our 'Aha!' moment for the *3MtM* concept. What if we made a game based on millennials' preexisting social media behaviours? Might this be a more effective way to spread education and awareness about nuclear weapons and disarmament? Instead of asking the millennial generation to change their behaviours, to become "activists" in the 20th century sense of the word, why not ask them to walk between realities. Why not invite them to become players in a pervasive game that blurs boundaries between fantasy and reality? Why not lower the threshold for participation in nuclear disarmament by making it fun, collaborative, and online?

Generational Literacy Gaps

I tell this story for two reasons. Firstly, it provides context for the origin of the *3 Minutes to Midnight* game concept discussed throughout this paper. Secondly, and just as important to the discussion in this paper though less obvious, the story demonstrates a gap in digital literacy between the baby boomer generation and the millennial generation². This is the part where my father, born in the 1950s, was quite unaware of what I considered fundamental knowledge of the realm of digital media. Had I told an expanded version of the story, I would have included the part where I was completely blown away – *no pun intended* – having learned the facts about the state of nuclear weapons today³. That part of the story, exemplifying my own naiveté and ignorance, would have illustrated a third important point of discussion – the dangerous gap in nuclear weapons literacy between the millennial generation and the baby boomer generation.

There is nothing new about finding a generational literacy gap between a generation and their offspring. This phenomenon is to be expected to some degree as technology evolves and different generations grow up with technologies. The significant leaps in communication innovation throughout history shape generational identity, experience, and imagination. Philosopher Marshall McLuhan, for example, described a cognitive gap between the “moving picture generations” (referring to the early 20th century generations⁴) and the “TV generation kids” (referring to the baby boomer generation). He explained how the worldview of the boomer generation was impacted by the world’s first live satellite broadcast in 1967, how this experience of a “global village” would be a formative part of the baby boomer generation’s lived experience, something their parents, even though alive at the time, would be much slower to understand, if they ever did (McLuhan, 1967).

² The term ‘baby boomers’ refers to people born between the years 1946 – 1964. The term ‘millennials’ refers to those born between the years 1980 – 2000.

³ So much that I changed my final masters research project to focus on developing this game.

⁴ Including the ‘Lost generation’ born between the years 1883 – 1900, and the ‘G.I. generation’ born between the years 1900-1924.

The McLuhan discussion continues in the communication chapter, however, the critical message at the outset of the discussion is that generational gaps are real phenomena, that proficiencies in various literacies tend to be associated with certain generations, and that literacy proficiencies (and, deficiencies) from generation to generation have profound affect/material effects on the global human experience.

There are two generational literacy gaps relevant to my discussion in this paper. The first is the one elucidated by my father's game design attempt, the gap in digital literacy between baby boomers and millennials. This gap has been talked to death in popular culture columns, books, and news stories. Baby boomers' "reluctance", or, in the best sense of the word, "obtuseness" towards digital media culture has already been established. The second generational literacy gap is the one revealed by my ignorance to the greatest immediate danger to life on earth. This is the gap in nuclear weapons literacy between the millennials and the boomers, and this time it's the millennials who suffer a major deficiency. This gap has seldom been mentioned in popular culture. Indeed, as my research findings suggest, the lack of critical discussion about nuclear weapons in popular culture today is partly responsible for the widespread nuclear weapons ignorance in the millennial generation.

This generational gap in nuclear weapons literacy is a vital research finding because it connects and unlocks my other findings, such as pointing to a central problematic for the nuclear disarmament campaign. Any campaign will have hard time rallying support if an entire generation of young adults is clueless that a problem even exists. Interestingly enough, one of my findings is an emergent theme in the disarmament movement citing lack of public interest and popular support as a major setback in making progress. It's not the complexities of international politics getting in the way of riding the world of nuclear weapons; it's the lack of public support.

To summarize, my research findings suggest: 1) The millennial generation is ignorant to the problem of nuclear weapons; 2) their ignorance is related to the prominence of fictional / fantasy representations in popular culture today; 3) that representations of

nuclear weapons in pop culture have a positive correlation with levels of civic engagement with nuclear disarmament; and 4) that lack of public support and popular engagement is a major setback for the nuclear disarmament movement in the 21st century. There is also a fifth relevant observation, though not a research finding per se, relating to the digital literacy generational gap discussed earlier. The majority of people engaged in the campaign for nuclear disarmament are now elders, with the baby boomers being at the younger end of the spectrum. I therefore speculate a deficiency in digital media literacy most likely exists within the nuclear disarmament movement itself.

Looking at all of these findings together, a thematic line appears, linking them. This line is communication. What messages about nuclear weapons and nuclear disarmament are being communicated today and to whom? Through what channels? How is the information being designed for these channels? Is this process data-driven?

It appears to be a communication breakdown, and an extremely dangerous one given the nature of subject at hand. It is not that millennials don't care about preventing nuclear holocaust, it's that they don't know they have to. And it's not that nuclear disarmament leaders don't want to involve younger generations, it's that they don't know how to reach them. It's all about communication, and this, is where the speculative design of the pervasive social impact game *3 Minutes to Midnight* comes in.

The game serves as a unique communication platform that disseminates, aggregates and connects critical information and action about nuclear disarmament. Its innovative approach leverages the millennial generation's greatest pastimes – social media and digital gaming – and also their greatest asset—access to data— as a way to spread awareness of the critical information needed to ignite the global movement for nuclear disarmament in the 21st century.

Due to the scope of this paper, discussion of detailed game mechanics and elements will be quite limited, since the game has yet to be developed. As a speculative design project, the game concept as it stands, is rife with possibilities. As such, references to the game design may come across as vague or unclear at times. To help with this, I encourage

readers to browse through the original game concept document included as Appendix A before diving into the paper, as this at least provides the starting point from which the *3MtM* design has evolved. This paper can be understood as both an annotation of inspiring concepts and a documentation of the game's evolution and future direction.

It is also important at this point to state that when I refer to the millennial generation, or millennials, I am referring in a rather generalized and privileged way to my peers. The millennials I am talking about in the context of this research are educated⁵ young adults in the developed world, born between the years 1980 and 2000. I say generalized, because it is impossible to be precise when speaking of millions of people as a unified group, and I say privileged because my research is based out of a western academic institution, as are the majority of reports on the millennial generation.

⁵ Educated meaning they have had access to, at minimum, free public education from kindergarten to grade 12, or equivalent.

CHAPTER 1 - METHODOLOGY

Speculative Design

The *3MtM* game concept is approached from an emerging speculative design (SD) methodology, a framework connected to more widely known practice-based research. SD is a structured, creative approach to research and design projects that aims to spark critical discussion about an issue while simultaneously proposing innovative solutions. It is recognized within academia as a way “to reconceptualise problems and seek more imaginative propositions” (Rosengarten, 2014). Hendren (2014) describes the SD approach as a way to “form bridges between academic and popular debate around important technological, cultural and socio-political issues” (para. 2). Several scholars have stressed the value of SD a progressive alternative⁶ to other design approaches in that it views design in relation to systems complexity and social issues, from both theoretical and material levels (Dunne & Raby, 2013; Bratton, 2016). Successful SD projects are meant to be evocative, ambivalent, and dramatic in nature, blurring the line between reality and fiction. “The best SD projects,” says Bratton, “position us between pro and con interpretations: is this ethical and/or unethical, is this remedy and/or poison?” (2016, para. 37).

3MtM fits within this speculative design framework because it straddles several realms of suggestion and inquiry. It is subject to the critique of ‘techno-utopianism’, while at the same time opening space for critical discussion about the use of social technologies to strategically advance the campaign for nuclear disarmament. It is imagined both as digital game and activism campaign, part entertainment and part reality, informed by practical and theoretical knowledge of both digital trends and social movements. It is a possibility and a proposition, meant to incite critical discussion about the recruitment of popular support for the anti-nuclear movement and the recruitment of a team of real world people to design, fund, and develop some version of the game concept. It is a fresh

⁶ Speculative design has even been called an “alternative to design alternatives” (Bratton, 2016).

perspective on an old problem. A hopeful attempt based in theory and vision. As Dunne and Raby (2013) say in their seminal book, *Speculative Everything*, “We don’t know how to fix the planet and ensure our survival. We are just hopeful” (p.1). This is the case for the *3MtM*. It is not saying it is the right way to go, but it is saying this is a *way* to go; a way that has not been tried before, and that, in theory, could work...

The following passage from the chapter “Beyond Radical Design” in Dunne and Raby’s book captures the essence of why I chose speculative design as the methodology for the *3MtM* research project:

This [speculative design] form of design thrives on imagination and aims to open up new perspectives on what are sometimes called *wicked problems*, to create spaces for discussion and debate about alternative ways of being, and to inspire and encourage people’s imaginations to flow freely. Design speculations can act as a catalyst for collectively redefining our relationship to reality (p.2).

The threat of nuclear weapons is arguably the most ‘wicked problem’ we face today, a problem on which public discourse has stagnated severely since before the turn of the century. Using a traditional research or design methodology would not offer the freedom and space necessary for the innovative approach needed to redefine reality. The speculative design approach is the perfect match for the *3MtM* angle of using 21st century tactics to address a 20th century problem. As Bratton (2016) notes, “Some may even conclude that the job of Design in the 21st century is to undo (much of) the Design of 20th” (para. 1).

Research Methods / Creative Process

The following is an overview of five methods used in *3MtM*’s process-driven research approach, and the logic for using them.

Ethnographic Field Observation

Ethnography chose itself as a research method, as the story about the game's origins reveals. It was the situated position of the researchers as master of digital media students that allowed *3MtM*'s seminal 'aha!' moment to occur. The ethnographic method of observation is where researchers become members of study group. It is known to increase the chances for researchers to observe things as they really are, despite a risk of personal bias. As a master's student I was already a member of one of the groups we needed to investigate for this design, with the target audience for the *3MtM* game being millennial university students.

An ethnographic approach also proved useful for researching content development for the game. As a board member of Physicians for Global Survival, Jonathan is a member of the international network of physicians for nuclear disarmament. He submitted the initial game concept document as an abstract to Pegasus Conference 2016 in Toronto; it was accepted. A significant amount of research and partnerships developed from our participation in this conference.

Professional Presentations

As a research method, professional presentations, or pitches, are effective to fuel the iterative design process. They create space for immediate informed discussion and critical feedback, both required to improve the next design iteration. The five pitches I conducted proved to be invaluable sources of qualitative research data used in the development of the *3MtM* project.

The first time I pitched *3MtM* was at Pegasus. I designed the presentation to interest the audience – mostly aging baby boomer nuclear activist doctors and scientists. For my first pitch, I presented to a humble crowd of 8 people and 42 empty chairs; it went well. Word got out about the fresh 'digital' perspective of my talk, and I was asked to present again the next day. That one went even better. It was amazing how 'disconnected' this demographic was from social technologies, yet how informed they were about global

politics, nuclear threat, and public health. I spoke with dozens of renowned global health professionals who were interested in the *3MtM* project. They shared relevant knowledge, critical insights, and a few suggested partnerships between *3MtM* and their organizations.

Documentary Analysis

The documentary analysis method for this project was a web-based process involving a pop culture environmental scan and analysis. I surveyed digital games, movies, TV shows and current events / news items that centered on nuclear weapons. This was relevant to my research because pop culture representations tend to reveal social fears, desires and interests (Asma, 2014). I surveyed from popular media from the 1950s to today and found significant trends in the media landscape relevant to the design thinking behind *3MtM*.

To research the current geopolitical landscape, I set up a daily Google alert for all international news items related to nuclear weapons. Every day I would browse through the headlines and read the top three most relevant articles related to nuclear threat. This process gave me a sense of what is happening at the ground level with nuclear weapons today, in terms of both proliferation and disarmament efforts. It revealed a strong sense of geopolitical instability of our current time, a vital research insight for the game. Political instability / lack of faith in government has been identified by nuclear weapons scholar Ward Wilson as the most important factor for determining the likeliness of a large-scale citizens campaign for nuclear disarmament (2016).

Case Studies

Eisenhardt (1989) says that case studies are, “Particularly well suited to new research areas or research areas for which existing theory seems inadequate” (p.548). This was the case with the speculative design research for *3MtM*. Although there is significant research around individual components that contribute to the *3MtM* game design, such as ‘serious games’ and ‘social media marketing’, there is little that asks questions from a research perspective seeking to combine such components.

As such, I selected cases that can be understood as ‘precursors’ or ‘signals’ to the design of *3MM*. For example, the KONY 2012 campaign was the first time a group had intentionally set out to harness the “power of social media” at an international scale to address a social cause. Although the KONY 2012 campaign led to the birth of the term ‘slacktivism’, it also garnered unprecedented global engagement with the millennial generation through its strategic use of digital media. This campaign was successful in its reach, but lacked in content integrity, and in achieving any meaningful actual social change as a result of its efforts. As the old baseball saying goes, it was ‘the right connection, wrong direction.’ Examining the strengths and faults of this campaign revealed valuable insight regarding social media campaigns for social change, specifically the importance of content credibility and integrity.

Literature Review

The literature review for this project was multisided. It spanned disciplines of design, computer science, game studies, psychology, marketing, nuclear science, political science, cultural studies, public health and history. The review provided me with an informed foundation necessary to ask critical questions, make original connections, and explore innovative design possibilities.

I used the lit review process to deepen my understanding of digital gaming, social media marketing, and nuclear threat, to relate my ideas to theory, and to develop them according to best practice. Rather than report all of my literature review findings in one chapter, the findings are dispersed throughout this paper.

CHAPTER 2 – POP CULTURE & NUCLEAR DISASTER

Millennials & Nuclear Weapons ‘Hyperreality’

Most baby boomers I spoke with regarding *3MtM* tended to think millennials are not interested in nuclear disarmament because they are preoccupied with other concerns, such as climate change and downward economics. It makes sense that boomers might think that way, considering the findings of the new research study discussed throughout this paper (see Appendix B). Shah’s study found that undergraduate students listed employment as their greatest concern in life. The study also revealed that just .25% of the students perceived nuclear weapons as a concern. This is compared to 38% of students who listed nuclear weapons as a top concern in a similar Canadian study done in 1988.

In this section I discuss how representations of nuclear weapons, nuclear war, and nuclear apocalypse in 21st century popular culture have shaped the millennial generation’s relationship with nuclear disarmament to be one of fiction and fantasy, and thus, aloofness and ignorance. Millennials are the first generation of adults in recent history to have never experienced the chilling reality of nuclear weapons and nuclear war. They did not live through the nuclear threat of the Cold War or the nuclear massacres of WWII. As a result, their points of reference for nuclear disaster range from fictional backstory in action movies to desperado survival fantasies in game settings. Or, for the millennials who attend the massive new age party, Burning Man, located on former nuclear weapons testing grounds in the Nevada desert, they may have a fetishized romantic notion about a new utopian world emerging in the wake of nuclear catastrophe.

Contemporary Media Analysis: The 100

In the new pop TV series *The 100*, the ‘post-apocalyptic survivalist fantasy’ plays out to the extreme. The story depicts a group of beautiful renegade youth attempting to rekindle civilization on earth following nuclear holocaust. There is *Lord of the Flies* element of to it, but instead of young boys stranded on a deserted island after a plane crash, there are

mixed-sex juvenile delinquents cast to Earth from their mother spaceship 97 years after global nuclear apocalypse (supposedly) destroyed all life forms. Instead of the typical Mad Max post-apocalyptic setting of desert desperation, the young adults crash-land into a Fern Gully fantasy, complete with phosphorescent trees, glowing butterflies, and of course, two-headed deer. In the pilot episode, the handsome young leader yells feverishly to the crowd who surround a raging campfire: “Here there are no laws. Here we do whatever the hell we want, whenever the hell we want”. In response, the group chants in wild unison, “Whatever the hell we want, whenever the hell we want!!” In the second episode, after finding traces of humanoid survivors, the 20-year old blond heroine Clarke declares to the group: “There are people here, survivors. The good news is that means we can survive, radiation won’t kill us.” In reality, of course, there would be no survivors. The radiation poisoning would have destroyed the genetic potential of any human survivors to reproduce healthy offspring, leading to eventual die off. And, radiation would contaminate the water and soil so the young rebels would also be poisoned, and likely blinded from the sun’s extreme ultraviolet rays entering the earth’s atmosphere through the destroyed ozone.

The 100 first aired on the American television network The CW in 2014, and now streams on Netflix in several countries. Besides the *Fallout* game series and a smattering of others, it is one of the few current pop culture representations of nuclear disaster. The fact that a sci-fi TV show uses false atomic science to develop the plotline is not a problem on its own. It *becomes* a problem however, when there are no other popular culture representations that depict scenarios based on real atomic science to balance it out. For the millennial generation, the false science Fern Gully dreamlands and anarchist survivalist fantasies are the only representations of nuclear disaster out there. And, judging from these fictional/fantasy representations, it is nothing to worry about. Without fact-based media about nuclear weapons available for mass popular consumption, fiction replaces reality in the minds of those with no other points of reference.

Historic Media Analysis: The War Game

In earlier decades, it was relatively standard for popular media about nuclear weapons to be based in scientific fact and political reality. One noteworthy example is the 1965 made for TV film that was both produced and banned by the BBC, called *The War Game*. It is noted as being one of the first films of the ‘docudrama’ genre, despite winning the Oscar for best documentary. The film narrative used a mainstream news broadcast to report a nuclear attack on England. The footage features graphic disaster scenarios based on hard science, making it so believable that it was unclear whether the story was real or staged. This was a very innovative approach at the time, even if it seems regular today. It mixed fact and fiction in such a way that left audiences terrified, awed, and confused. Had the BBC decided to air the movie rather than ban it, the effect on the British audiences may have been similar to the public alarm following Orson Welles’ *War of the Worlds* ‘docudrama’ radiobroadcast in 1938, in which listeners believed a Martian invasion was real. It was not until the mid-1980s that *The War Game* reached mass audience through television, when it was aired on American “conspiracy theory” program *Alternative Views*. Interestingly, its 1980s (re)release date correlates roughly with the largest nuclear disarmament protests in history, an important correlation discussed at the end of this section.

The Sociocultural Link

My popular culture analysis revealed that media with chilling fact-based nuclear weapons premises such as *The War Game* was common until the early 1990s. Around that time, popular media about nuclear weapons detached from hard science and historical reality, and branched more distinctly into the realm of fantasy/fiction. However, media became not only less likely to depict real-life nuclear threat scenarios, but also altogether less likely. This transition from accurate to fictional representations of nuclear threat in popular culture links up with the fall of the Berlin wall in 1989, and provides a ‘logical’ explanation for the shift. More interestingly to my research, however, is the link between the timing of this shift and the early childhoods of the first half of the millennial generation. Vygotsky’s (1978) sociocultural theory explains how cultural and social

landscapes have profound impact on children's cognitive development. "The social dimension of consciousness is primary in time and in fact," writes Vygotsky. "The individual dimension of consciousness is derivative and secondary" (1979, p. 30). Accordingly, the fact that millennials were forming their early mental models of the world at the same time as the baby boomers and gen X-ers⁷ were celebrating their post-Cold War relief is significant to their conceptualization of nuclear threat. At a critical stage in their early cognitive development, millennials were steeped in a sociocultural environment where nuclear weapons were not to be feared, where the war was over and the battle had been won. Considering their early social exposure, followed by the 1990s popular cultural landscape of increasingly fictional and decreasingly there nuclear-related media that has continued through to present-day, it becomes more clear why millennials are hard-pressed to be engaged in the battle for nuclear disarmament. In their reality, it's an irrelevant battle, after all, what is there to worry about?

Through unintentional and subconscious sociocultural processes, fiction has become reality relating to nuclear weapons and nuclear dangers in the minds of the millennial generation. In many ways this situation echoes Baudrillard's (1983) concept of simulacrum, where the representation of something replaces the reality. His theory describes 'hyperreality', where reality is replaced by simulation. In a hyperreality we operate not from what is real, but from what is simulated. As such, I argue the millennial generation lives in a hyper-real relationship with nuclear weapons. They operate in the world according to fictional simulations of nuclear weapons learned through popular culture. Post-cold war popular media developed a cultural landscape in which nuclear weapons exist purely within the realms of fantasy and fiction. All this is to say that millennials, for the most part, have no idea how real a threat nuclear weapons are today, how close we are to experiencing the worst genocide in human history. It's not that millennials do not care. It's not that they are distracted with other issues, as baby boomers

⁷ Gen X-ers refers to Generation X, the generation born in between the boomers and the millennials.

may tend to think. It's that, besides a (possible) lesson in grade ten history⁸, for the millennial generation, nuclear weapons exist within a space of fiction.

Disarmament Participation & Pop Culture Correlations

Ward Wilson's (2015) article titled "Why are there no big nuke protests?" asks exactly that. Wilson, a historian, surveys the popular participation in the nuclear disarmament movement over the decades and tries to find a key to understand what triggers participation. Figure 1 shows a graph he created as a visual representation of the odd pattern of participation levels in the movement over time. He notes that hundreds of thousands, possibly a million people participated in the protests of the early 1960s, and then after a 15-year decline, greater numbers participated throughout the 1980s, after which it dropped at the end of the 80s, and has since completely fizzled out. Wilson points out that this double-peaked shape is unique in the history of social movements, and tests out plausible explanations such as danger related to size of nuclear arsenals, defense spending, fear levels from policy crises, none of which end up correlating to the odd shape of disarmament participation overtime. In the end, he speculates that 'faith in government', as in, whether people think world leaders have the nuclear situation "under control", is responsible for the rise and fall of participation in the nuclear disarmament movement. Wilson argues campaigns need strategies to decrease public confidence in government nuclear policy: "Overcoming this sense that government has things effectively managed is the key to large-scale citizen involvement" (p.58). His argument is persuasive, although the correlation is purely speculative. To further Wilson's inquiry, I present another, more data-driven correlation.

⁸ Shah's study revealed that a vast majority of the 62% of students who reported having learned about nuclear weapon/war at some point in their lives, had learned nothing beyond a brief WWII lesson in grade 10 history class, as part of the Ontario high school curriculum. Noteworthy, is that the lesson was part of history class and not in social studies or physics or current events. This means that although millennials may have learned about nuclear weapons, they have only ever learned about them as a past problem, a problem long since solved.

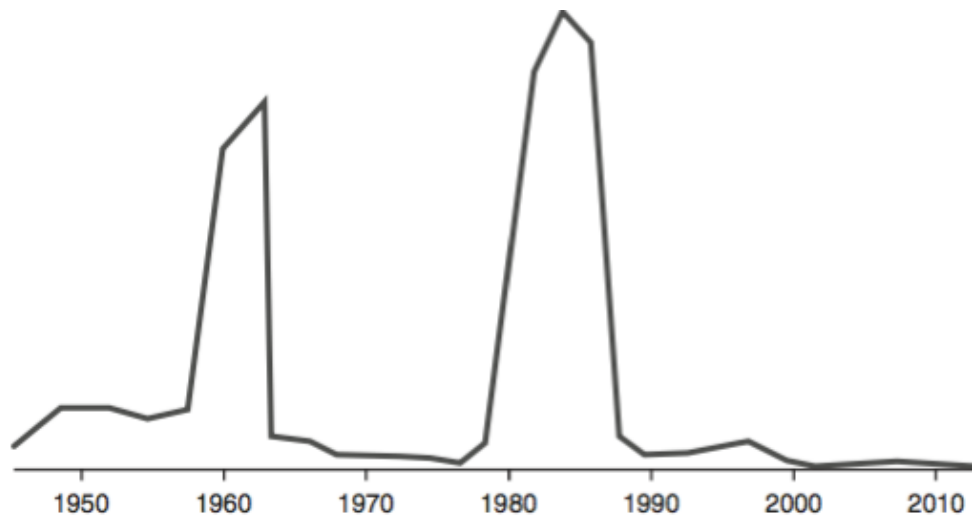


Figure 1 Approximated participation in anti-nuclear movement worldwide, 1950 – 2015 (Wilson, 2015)

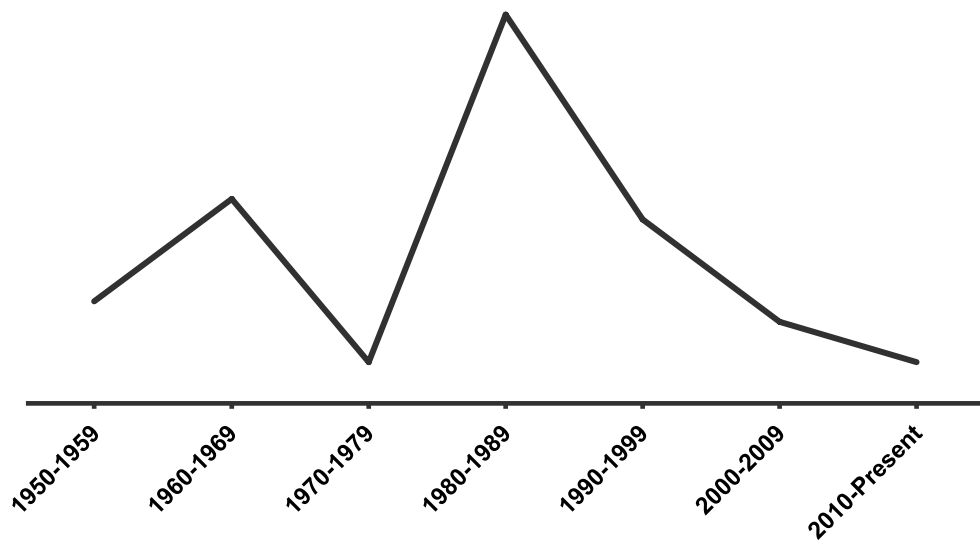


Figure 2 Popular culture films featuring nuclear weapons worldwide by decade, 1950 – 2016

The graph displayed in Figure 2 shows the temporal trend in popular culture of movies about nuclear weapons and/or nuclear war. The graph features seven data points, each representing the number of nuclear-themed movies released per decade. The data was collected from the results of a Google search with the key terms ‘nuclear weapons’ and ‘movies’. The data set consisted of all 52 movies from the search result, which had release dates ranging from 1951 through to present-day. At first glance at the raw data I noticed a lack of film released in the 21st century, so I thought it would be interesting to plot by

decade. Inspired by the simplicity of Wilson's graph (Figure 1), I decided to separate the chunk the data according to release date and match Wilson's temporal scale. Surprisingly, the graph revealed a similar odd double-peaked shape to that of participation levels in the nuclear disarmament movement over time featured in Figure 1.

The positive correlation between the numbers of popular movies featuring nuclear weapons and the levels of participation in the nuclear disarmament movement over times is striking. To start, it begs the question of a potential causal relationship, which then leads to a chicken/egg conundrum, meaning, which came first? Did popular participation in the disarmament movement bring about more films being made about the subject matter, or was it the other way around? Perhaps the relationship is purely associative. Regardless, the finding of a positive relationship between the presence of nuclear weapons in popular culture and the participation levels in the nuclear disarmament movement is worth exploring. It is possible that producing popular media featuring nuclear weapons may actually lead to an increase in popular engagement the nuclear disarmament movement. In 2016, the digital gaming industry is larger than the film industry⁹, and so from the perspective of *3MtM*, what better way to explore this possibility than creating popular “nuclear” media in the form of a digital game.

⁹ An article by Business Tech comparing the world's largest entertainment industries ranks the 'Video Game Market' fourth at \$91.5 billion in 2015. In fifth place is 'Movie Production and Distribution', at \$89 billion. According to market projections by business insight company Newzoo, the gaming market will reach \$99.6 billion in 2016 (Biggest Entertainment Markets, 2015).

CHAPTER 3 – COMMUNICATION BREAKDOWN

The Best Problem to Have

A surprising theme emerged in my research surrounding the contemporary nuclear disarmament movement. It seems a major setback in the movement today is the lack of public interest and public support (Boyer, 2016; Shah, 2016; Walker, 2010). In this section I argue that in today's era of digital communication and social media marketing, lack of interest (in other words, lack of awareness) is the best problem the nuclear disarmament movement could have.

The 21st century campaign for nuclear disarmament differs from the vast majority of other contemporary social movements in several fundamental ways. First of all, the movement targets a single issue at an international policy level. Compared to complex issues such as sexism, racism, poverty or climate change, for the disarmament movement, it is very clear what “success” looks like. The movement's goals are clearly articulated, as are the steps needed to achieve them. There are organizations, networks and working groups made up of politicians, military leaders, physicians, scientists and peace activists who have plans and policies for nuclear disarmament ready to go. For example, the organization Global Zero has a detailed step-by-step disarmament plan for the world to be free of nuclear weapons by 2030 (see Global Zero Commission, 2010). Other groups, such as US statesmen who make up *The Partnership*, as described by author Philip Daubman (2011) in his book of the same name, have informed policy proposals for how to end nuclear threat (see Shultz, Perry, Kissinger and Nunn, 2007). Political and military experts have laid out strategic plans for nuclear disarmament that consider potential dangers and best practices for moving forward. The goals, steps and plans have been discussed, debated and developed from interdisciplinary perspectives for decades. They are goals that many world leaders have committed to enacting, from President Obama in his 2009 pledge for a nuclear weapons-free world in Prague, to the 127 nations who have

formally endorsed The Humanitarian Pledge¹⁰ for nuclear abolition (Traynor, 2009; ICAN, 2016). The important point here is that brilliant thinkers have already developed the solution, the “way out” of the nuclear weapons mess. The 21st movement does not need help finding a solution to the problem of nuclear weapons, or even convincing world leaders to support such a solution. Rather, the nuclear disarmament movement needs help finding the public pressure to push the highly developed solutions into the forefront of global political discourse.

Secondly, nuclear disarmament is different from other movements because, broadly speaking, it does not require people to question themselves at a personal level or change their deeply ingrained behaviours. The problem is political rather than personal (except for the people who work within the nuclear industrial complex, but that’s a topic for another paper). The contemporary nuclear disarmament movement requires awareness, finger pointing, fact sharing, and accountability holding, things most people are eager to do. Thirdly, it is fairly easy to understand why nuclear disarmament is necessary, once presented with some basic facts. For example, the fact that nuclear weapons are the only weapons of mass destruction not yet explicitly prohibited under international law is a good starting point (ICAN, 2016). The arguments for why we need to abolish the most dangerous threat to human existence are compelling on their own, even for the most apolitical of people. “After all,” says Ward Wilson, “if the danger of killing 300 million people and deeply damaging world civilization isn’t enough to elicit a sober respect and concern for the problem, you’re not doing it right” (2015, p. 58).

Finally, the nuclear disarmament movement is unique from other social movements because ‘raising awareness’ is, arguably, the key to achieving the movement’s goals. This is not the case for the majority of other activist campaigns. Various studies suggest ‘awareness campaigns’ have very little effect on changing anything at the ground level, and can even be counter-productive in some cases (see Singal, 2014). Although these

¹⁰ The Humanitarian Pledge is an international effort to fill the “legal gap” for the prohibition and elimination of nuclear weapons. The Pledge emerged out of the Vienna Conference on the Humanitarian Impact of Nuclear Weapons in December 2014. It is seen as a direct answer to the lack of disarmament progress in recent history (ICAN, 2016).

campaigns may be successful in raising general ‘awareness’ about a certain issue, there is often very little change that happens to actually improve the issue. For example, countless campaigns about climate change have worked for years to “raise awareness”, yet climate change remains one the greatest threats to global survival. The KONY 2012 case study, discussed at the end of this section, reveals that awareness campaigns can also serve to increase complacency. When people feel as though they have ‘taken action’ simply by becoming aware, they are likely to think the problem has been addressed, even though no material change actually occurs. Awareness campaigns are prone to promote self-congratulations among the already privileged, and to lack in their follow through and accountability for real change. We buy into the myth that our awareness alone is going to make something better. However, when we do this, the ‘action’ we take really only serves to make ourselves feel better, rather than make anything better for the problem at hand.

Despite the common pitfalls of campaigns for awareness described above, I maintain that in the case of nuclear disarmament, raising awareness is key to accomplish the movement’s material goals. What the movement desperately lacks is the surge of popular civic support required to transform plans into reality. Considering the unique characteristics of the movement, and the utter millennial ignorance on the matter, a strategic and sophisticated “awareness campaign” has the potential to catalyze major progress and political impact. And through critical use of new media such as gaming, memes and social media, a campaign of this nature might be not only a politically productive endeavour, but also an enjoyable one! Which is why I suggest, that ‘lack of public support’ is the best problem the nuclear disarmament movement could have. This lack of public support is deeply connected to the severe problem of generational ignorance. And ignorance is, after all, simply a problem of education, and education is simply a matter of communication, and communication is all about medium.

‘The Medium is the Message’

This segues nicely into Canadian cultural theorist Marshall McLuhan’s famous insight – *the medium is the message*. The form of communication matters even more than the obvious

content it delivers, because the form is also part of the content. McLuhan scholar Mark Federman explains, “A McLuhan message always tells us to look beyond the obvious and seek the non-obvious changes or effects that are enabled, enhanced, accelerated or extended by [a] new thing” (2004, para. 6). In his book *Understanding Media* (1964), McLuhan describes each form of media as an extension of some human sensory experience. So TV, for example, is an extension of the eyes, of sight. Following this logic, digital media would be combined sensory extensions of sight, hearing, and touch, together forming an extension of interaction. With this consideration, as designers we must ask: What are the most effective formats for content distributed through interactive media channels? How can we design content that maximizes the interactive affordances of these channels? How can we make digitally mediated interactions count at the ground level?

McLuhan argues the medium of television brought the world together through creating a sense of shared lived reality, and that this sense of shared reality, global community, is the message. The electronic broadcast of images allowed a global audience to see things together, simultaneously, that otherwise they would have never seen. Everyone was connected through visual experience; they were all looking at the same thing, even while they were all apart from each other, all over the world. Through the medium of television came the message of belonging to a “global village”.

The 1967 television broadcast, “Our World”, was first live worldwide satellite broadcast in history. In an interview at the CBC studios moments before the live broadcast, McLuhan remarks that what was about to happen was a monumental moment in the history of human communication. He said that for the first time, “people will be drawn into it as participants, whereas they merely view themselves as spectators at the moment” (McLuhan, 1967). McLuhan remarks on the significant cognitive shift that happens at a generational level with such a leap. Going from centuries of being a detached audience, to suddenly, being involved. He referred to it as an ‘x-ray’ experience, meaning it was immersive, it went deep. Broadcast television was the revolutionary communication channel of the baby boomer generation. Digital media is the revolutionary

communication channel of the millennial generation. In both cases the parental generation struggled to make sense of their children's new kind of media.

Ubiquitous Computing: A Communication Revolution?

It makes sense that the nuclear disarmament movement faces a communication problem given the last major campaigns were in the 1960s and the 1980s (Wilson, 2015). In the article "Clicks and Commitment: Activism in the Age of Social Media", Peter Hirsch writes: "There is ample evidence that each generation reinvents social activism to meet the needs and the communications channels of its time" (2014, p.55). Clay Shirky (2009), however, argues that contemporary culture is experiencing something far greater than a shift in communication channels between generations. He maintains that human civilization is currently undergoing a paradigmatic shift in human communication; in other words, we are living in the midst of a communication revolution. Widespread adoption of social (digital) technologies, he explains, have fundamentally changed the way humans go about solving problems, sharing information, and organizing as groups. In Shirky's perspective, the magnitude of this change is comparable to the widespread adoption of the printing press half a millennium ago, a change that birthed the modern era. The key to revolution in both of the contexts is 'widespread adoption'. Shirky explains:

The invention of a tool doesn't create change; it has to be around long enough to that most of society is using it. It's when a technology becomes normal, then ubiquitous, and finally so pervasive as to be invisible, that the profound changes happen, and for young people today, our new social tools have passed normal and are heading to ubiquitous, and invisible is coming (p.105).

In the second quarter of 2016, Facebook reported 1.71 billion active users (Statista, 2016). Considering the total online population is approaching 3.5 billion, Facebook users make up nearly half of the total online population. The steady and dramatic increase in the number of both Facebook users and Internet users worldwide, shown below in Figures 3

and 4, suggests the social media platform is now comfortably positioned within the ranks of ‘ubiquitous’, whereas Internet has become ‘invisible’.

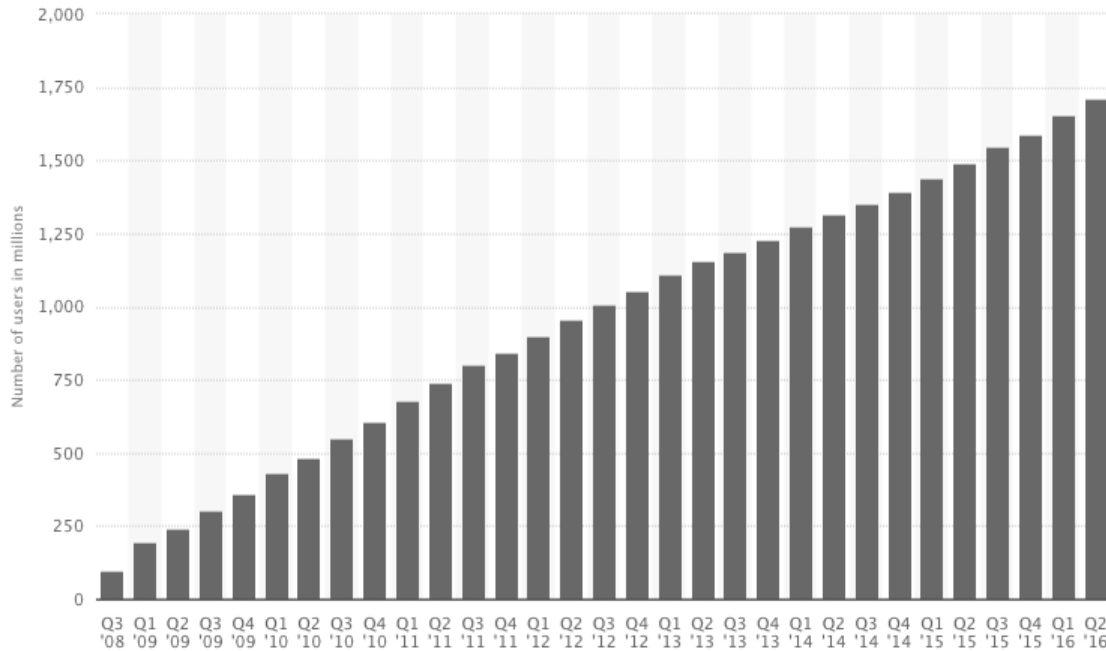


Figure 3 Number of monthly active Facebook users worldwide as of 2nd quarter 2016, in millions (Statista, 2016).

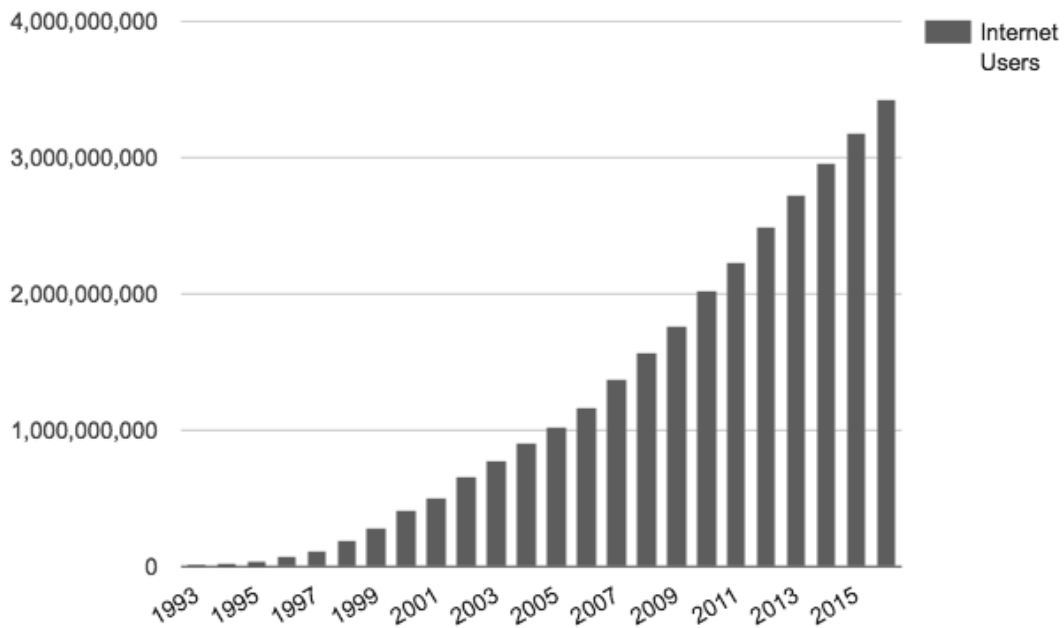


Figure 4 Number of Internet users per year worldwide, from 1993 to 2016 (Internet Live Stats, 2016).

As predicted nearly a quarter century ago by Marc Weiser at Xerox PARC, we are now immersed in a post-desktop realm of computing – a realm Weiser called ubiquitous computing (Weiser, 1993). Commonly referred to as ‘ubicomputing’, ubiquitous computing refers to the variation, multiplication, and integration of computing devices in our daily lives. In an era of ubiquitous computing, invisible information transfer happens anytime and anywhere. Unlike the status quo computing experience of the 1990s, marked by single device interaction with a stationary desktop machine, today’s computing experience is defined by simultaneous interaction with multiple, diverse, and often portable devices. It is not uncommon for an average North American to move between interactions with a smartphone, a laptop, a tablet, and a desktop computer without thinking twice about it. With the emergent Internet of Things (IoT) – where everyday devices such as dishwashers, coffee machines, and thermostats have embedded microprocessors and are connected through wireless networks – the diversity of devices included in such interactions is bound to increase steadily. It is projected that by the year 2020, roughly 24 billion devices will be connected through IoT (Gubbi, Buyya, Marusic, & Palaniswami, 2013). The decreasing cost of consumer technology also contributes in to the recent ‘multi-device user’ phenomenon. Revolution or not, in our current age of ubiquitous computing, the rules have changed for just about everything, including change itself.

To truly combat the problem millennial ignorance, the nuclear disarmament movement must develop content that considers the affordances and the best practices of today’s most popular communication channels. For example, digital technologies afford highly motivated people to create a context where barely motivated people can become effective participants within a movement, without having to become full-blown activists (Shirky, 2009). This is contrasted with the communication technologies of the 20th century where “coordinating group action required convincing people who care a little to care more” (Shirky, 2009, p.181). In today’s era of ubiquitous computing, it is best practice to design content according to device, audience/user, and location. In digital media there is a movement to “go mobile”. This means, design for the small mobile phone interface, rather than simply resize the design for the big computer interface to fit in the small

screen. Similarly, I argue for social movements to customize their campaign communications to flow easily through 21st century channels, rather than try to adapt communications designed for 20th century channels to the digital space.

Campaign Communications Using Social Technologies

3 Minutes to Midnight is what might be called a ‘social campaign game’. This term is descriptive and allusive, because as it stands, it does not exist; it’s purely speculative. Each word – social, game, and campaign – has a complex level of meaning, making it quite a nuanced term, perfect for capturing what *3MtM* attempts to do. Social is perhaps the most important word of the three. It refers to social technology, social media, social networks, social justice, social change, social movement and social games (commonly referred to as massive multiplayer online games, or MMOGs). Using the word ‘social’ also implies that collective effort having greater success than individual effort, that this involves working together. And, important for millennials, ‘social’ also infers fun, excitement and entertainment.

Social media is an integral part of the game concept. *3MtM* gameplay takes place using social media – posting to social media, sharing memes, sharing articles, sharing videos, sharing information. Social media is also used as a way to recruit supporters/players, and to organize *3MtM* events. The decision to use social media as a core part of the *3MtM* design considers what millennials are already doing. They are spending a lot of time on Facebook; it has become their “social hangout space”. When they are sitting alone at the bus stop or in the school classroom, they are also hanging out in this online social space (they are, quite literally, in two places at once!). Instead of asking millennials to change their social space away from Facebook, *3MtM* wants to provide them with the opportunity to stay there *and* also be able to participate in the movement for nuclear disarmament in a way that feels fun and doable.

The new original research by Nikki Shah (see Appendix B) reveals that 90% of millennial undergraduate students find out about social movements and activist campaigns through

Facebook. This was followed by ‘word of mouth’ for 67% of students, and ‘Mainstream Media’ for 63%. Considering how many undergraduate students view social media, specifically Facebook, as a legitimate and primary place to learn about activist campaigns and social issues, it makes sense to design campaign communications in way that maximizes Facebook’s interactive, and even productive, affordances.

Another relevant finding from Shah’s study reveals millennials’ increased familiarity with activist campaigns that designed communications specifically for Facebook. Out of fourteen activist campaigns/social movements, the students were most familiar with the ‘Ice Bucket Challenge’, a campaign to raise funds for ALS research. Of all the campaigns listed, the Ice Bucket Challenge the only one whose primary communication strategy involved a media formatted specifically for dissemination through Facebook.

Interestingly, and as further evidence of the millennial ignorance described earlier, the campaign least familiar to the undergraduate students was the International Campaign to Abolish Nuclear Weapons (ICAN).

Ice Bucket Challenge

The Ice Bucket Challenge campaign used a fairly straightforward video meme as their primary communication tactic. The game, or challenge, asked people to post videos on their Facebook profile of a bucket of ice being dumped over their head. Players then “tag” other people in their network, challenging them to do the same. The people who get tagged are then supposed to post their own video, tag others, and so forth. Those who don’t complete the challenge after being publically “tagged” suffer the potential of public shaming by their Facebook friends, who are able to see who participated in the challenge, and who flunked out.

KONY 2012

KONY 2012 was quite possibly the first “activist” campaign to spread virally through the strategic use of digital media. The viral-video vigilante campaign against Ugandan guerrilla army leader, Joseph Kony, was created by a small non-profit organization based

in the United States, called Invisible Children, Inc.. The business was co-founded in 2004 by three young, white, American males after returning from a trip to Africa, where they had learned about a supposed war criminal named Joseph Kony.

As an experimental campaign, the friends used viral marketing strategies and social technologies to launch a digital media campaign that they believed would lead to the capture and prosecution of Kony. They also used simple game mechanics, such as team-based language, appeal to epic meaning, flashy motivating incentives, clear directions on how to participate, and promise of profound impact. The organization attempted to persuade viewers that watching a half hour documentary video and sharing the film through social networks would lead to Joseph Kony being caught by the end of the 2012 calendar year. However, the group never actually had a plan on *how* sharing the digital campaign would actually enact their lofty goal.

In terms of reach, the campaign was incredibly successful. The campaign's mini-documentary received 50 million video views within 72 hours of it being posted online. The campaign also trended on Twitter and reddit, and made headlines in international news. Internet memes responding to the campaign also became popular; many mocked the campaign for its inadequacy to comprehend the complexity of the issue for which they rallied (see Figure 5, below, for examples). In addition to the campaign's blatant flaws, it suffered several other disastrous turns. Besides failing to capture their villain and grossly over-simplifying the complexities of the situation and African politics, the group was publically shamed via social media for their extravagant operations spending and questionable journalistic integrity. And, if that was not bad enough, one of the organization's co-founders, Jason Russell, was also arrested during the campaign for public intoxication, car vandalism, and masturbating in public (Grieco, 2012).

As far as impact, KONY 2012 was successful in making it common knowledge that Joseph Kony was a genocidal African war leader who deserved to be punished, but that's about it. Four years later, the only evidence of any "change" resulting from the

campaign's efforts, is that upon asking my peers if they know what 'Kony 2012' refers to, most are able to provide some vague version of what could pass as a "correct" answer.



Figure 5 Examples of Internet memes in response to the KONY 2012 viral vigilante campaign by Invisible Children against Ugandan guerrilla army leader, Joseph Kony (Page, 2012).

CHAPTER 4 – GAMES AND PLAY

When digital games emerged as a new technology in the late 20th century, like most new technologies, they were highly contested. Parents and educators worried that digital games would lead to the downfall of society by rotting the minds of youth, whereas children and teens identified with new form, developing complex and powerful relationships with games. Media scholar Yalda Uhls (2015) points out that similar cultural battles played out in the 19th century following the introduction of the romantic novel, and in the mid 20th century following the advent of television, battles that both ended in truce. In the 21st century, perceptions and understandings of digital games have changed significantly, and it is more than safe to say, that truce has been found. Games are now appreciated in academia, advertising and activism as a powerful cultural medium. The following remarks from company president Michael Gallagher in Entertainment Software Association's 2016 report on the global industry demonstrate just how much sentiments towards games have changed in recent years:

Video games are the future. From education and business, to art and entertainment, our industry brings together the most innovative and creative minds to create the most engaging, immersive and breathtaking experiences we've ever seen. The brilliant developers, designers and creators behind our games have and will continue to push the envelope, driving unprecedented leaps in technology impacting everyday life for years to come.

While the above statement may be a slight hyperbole considering it is coming from inside the gaming industry itself, with over 1.2 billion people worldwide playing over 3 billion hours of digital games a week, the recent surge of appreciation of digital game is well justified (McGonigal, 2010).

Serious Games

Around the turn of the century, interest in using games as a tool for non-entertainment purposes, such as learning, began to increase. In the now classic book *What Video Games*

Have to Teach Us About Learning and Literacy (2003), James Gee identified dozens of valuable learning principles that can be found within games, from systems thinking to group work to identity formation, principles that help children develop critical life skills and literacies. Gee's seminal proposition that digital games can be used for educational purposes has developed into the flourishing field known as serious gaming. In the broadest sense, the term 'serious game' is used to describe games that have a primary purpose other than entertainment, such as vocational training, education, or activism. Games scholar Ian Bogost (2013) critiques the term 'serious games', however, because he argues that it has the effect of separating entertainment from whatever is supposed to be 'serious' and often institutional in nature. Bogost points out that 'serious games' are seldom made with the intention to be "played" as real games. When this happens, when concept or content takes priority, the message/power of the game as a medium is lost, and along with it, much of a game's potential for impact. Instead, Bogost argues for use of the term 'persuasive games', which highlights the expressive potential of games, and urges educators /designers to make games that work as games and as learning tools, to make games that really "mean it". Although *3MM* deals with the very serious subject matter of nuclear weapons and is designed with intentions that reach far beyond entertainment purposes, for the reasons Bogost described, it would be better categorized as a persuasive game than a serious game.

Pervasive Games

The rise of ubiquitous computing throughout the early 21st century has opened new opportunities for digital games, including the birth of a genre known as 'pervasive games'. Pervasive games can be broadly described as digitally facilitated games that blur lines between the player's regular life and the game, and take place in the real world at "human scale" (Benford, Magerkurth, & Ljungstrand, 2005). The recent game sensation *Pokeman Go* (2016), for example, is a pervasive game. Players interact with real world and the game simultaneously, mixing digital and material reality. Since players move through the real world as they interact with the game, their gameplay has a material effect on the real world, including other non-players. Anyone who happens to be in a public space

where pervasive gameplay takes place is subject to being impacted by, even incorporated into, the game. The unique characteristic of pervasive games taking gameplay off the screen and into physical (public) spaces, thereby necessitating ‘real’ human interactions, has made pervasive games of special interest to social researchers (see Björk, Holopainen, Ljungstrand, & Åkesson, 2002; Benford, et al. 2005; Flanagan, 2007). A 2011 Australian study on a pervasive game designed to foster healthy eating habits in elementary school children led researcher Mark McMahon to conclude, “Pervasive game strategies are ideal tools for learning approaches to promote active choice and real world learning transfer” (p.119). Similarly, researchers Schuller, Dunwell, Weninger and Paletta (2013) describe how pervasive gaming can help overcome the gap between newly learned behaviours and real-world application. Their study describes how pervasive gaming can serve “as a means to create incentives without incurring costs” (p.49), a strategy that could be very useful in an activist campaign context that seeks to maximize impact and minimize costs.

Pervasive gaming is an interesting concept within the *3MtM* design because of the way it blurs the line between fiction and reality. Considering the urgent need to transform the millennial generation’s relationship with nuclear weapons from fiction to realism, pervasive gaming holds promising possibilities as a medium. Another important feature of pervasive gaming in relation to the design of *3MtM* is its potential to “act as a tool for empowerment, community building, collaboration, and cultural change” (Flanagan, 2007, p.1). Game designer Jane McGonigal has experimented successfully with several applications of pervasive games for social change purposes, such as the 2006 game *Cruel 2 B Kind (C2BK)*. In this team-based mobile game, players had to “assassinate” each other with acts of kindness (McGonigal & Bogost, 2006). Through appropriating the war-based language of first person shooter games and putting it to use in a pro-social pervasive gaming application, the designers of *C2BK* managed to pull off a very difficult feat – making peace work appeal to those who might otherwise not participate.

Social Impact Games

A more recent development in the realm of gaming, which combines aspects of serious games and pervasive games, is the use of digital games to “do good”. Commonly referred

to as ‘activist games’, ‘games for change’, or simply ‘impact games’, these games strive to make a positive difference in the world. They can combine any variety of game mechanics and game elements to engage with social issues and complex problems in a creative and meaningful way. The resulting designs often challenge preconceived notions of what a ‘game’ is, and, what it means to ‘play’. For example, some impact games have solved incredibly challenging real-world problems directly through their gameplay. In 2014, “citizen scientists” decoded six months worth of cancer DNA data in a single month by playing the new mobile puzzle game *Play to Cure: Genes in Space* (McBride, 2014). The lead researcher behind the game, Hannah Keartland, shared her team’s enthusiasm about the implications in a press release shortly following the launch: “It’s still early days but we believe the collective force of global gamers could have a massive impact and speed up our life-saving research” (Cancer Research UK, 2014).

In her popular book *Reality Is Broken* (2011), game designer Jane McGonigal tells another story of gameplay making progressive change in the real world. In 2010, the collective gameplay of more than 20,000 British citizens brought about monumental reform a broken parliamentary system, and served justice to dozens of corrupt politicians. The game was called *Investigate Your MP’s Expenses*. It was launched by The Guardian newspaper as an experimental strategy, and has since been recognized as “the world’s first massive multiplayer investigative journalism project” (p.220). *Investigate Your MP’s Expenses* asked players to open copies of digitally scanned expense forms submitted by members of parliament, manually review them for inconsistencies and suspicious activities, and then enter notes on the findings of every form reviewed. In other words, the game required players to perform basic data entry. A rather odd premise; data entry is not the sort of task one usually finds within a game, nor is it considered to be a “fun” activity that might draw people to participate freely in their spare time. Yet, despite the unlikely premise, the game was hugely successful. Within days, tens of thousands of players had scanned millions of documents. In the end, all the players won, because together their collective gameplay led the real political changes they wanted to see. However, closer analysis revealed that promise of change was not the primary reason why so players participated in the game. Rather, it was the immediate emotional reward gleaned through gameplay

that motivated players. Simon Willison, the developer hired by The Guardian to make the game, explained in a later interview:

The number one lesson from this project: Make it feel like a game. Any time that you're trying to get people to give you stuff, to do stuff for you, the most important thing is that people know that what they're doing is having an effect. If you're not giving people the 'I rock' vibe, you're not getting people to stick around (quoted from McGonigal, 2011, p. 222).

Willison's above reflection highlights the importance of designing games with plenty of opportunities for simple emotional rewards. Even though the principal action required of game players was the mundane task of data entry, the design was able to paint the old task in thrilling new colours by incorporating classic game rewards, such making an obvious impact and having a clear sense of purpose, into the game's simple interface (McGonigal, 2011). The psychological power of simple incentives, even incentives as simple as getting to press a big shiny button on a screen, should never be overlooked or underestimated in the process of designing a game for social impact. Speaking on the use of simple game mechanics to influence human behaviour, gamification expert Yu-Kai Chu notes, "What we're seeing here is a complete shift from things we 'should do' to things we 'want to do.' But instead of shifting the tasks, we simply make what we should do fun (2016, para. 32). "

Gamers, Idle Social Warriors?

In her 2010 Ted Talk, Jane McGonigal argues that it is not just games designed to bring about change that are valuable in the global quest for a better world. Rather, critical skillsets and qualities cultivated through playing mainstream digital games are the very skills and qualities needed to conquer our most urgent real world problems. McGonigal describes four aspects of digital gaming that transfer to social justice activism. Firstly, gamers tend to experience sense of 'epic meaning' as they go about their activities, and they strive for what is known in gaming as an 'epic win'. An epic win refers to a victory so amazing and so unlikely, that before accomplishing it, it may have seemed unimaginable.

‘Blissful productivity’ is the next, which can also be described as ‘flow’¹¹. This refers to the highly enjoyable mental state of focused engagement where hours pass like minutes, yet every second is a heightened experience. Flow, or blissful productivity, is reportedly a common mental state for gamers. Third, is the sense of ‘urgent optimism’ that allows gamers to stay positive and keep trying their best even when floors are falling out beneath their feet and zombies are everywhere and the world is literally caving in. Armed with urgent optimism players refuse to lose hope they never give up. Instead, they seize every resource and tool available in attempt to achieving their mission. Lastly, gamers learn the value of developing a strong ‘social fabric’. This refers to the powerful sense of belonging that emerges within supportive community of people who share understanding, values, and purpose. Social fabric is an experience of profound personal and collective benefit from collaborating towards a common goal.

McGonigal calculates that on average, the number of hours a regular gamer spends playing during his/her upbringing – 10,000 hours by the age of 21 – is equivalent to a parallel system of education.¹² According to her calculations, there exists a generation of idle warriors among us, millions of millennials who have cultivated the critical skills necessary to win today’s epic real life battles. In which case the challenge becomes, how to rally the troops...

A Medium of Their Own

Not all serious game scholars share McGonigal’s panacean perspective of digital games, however. Both persuasive games pioneer Ian Bogost (2013) and distinguished game designer Eric Zimmerman (2013) have challenged the popular claim that games are going to change the world. In a keynote speech at the Games for Change conference in 2013,

¹¹ Hungarian psychologist Mihaly Csikszentmihalyi developed the positive psychology concept of ‘flow’. It refers to a mental state of heightened focus and sustained pleasure while engaged in a specific activity. A state of ‘flow’ is also commonly referred to the being in the ‘zone’.

¹² Ten thousand hours also happens to be the magic number of practice hours required to become a master at a given skill, described by popular writer Malcolm Gladwell in his book *Outliers* (2008).

Zimmerman argues that games are just one of many approaches to addressing larger problems, not the ultimate solution. He denounces the trendy argument in the field of games studies that (social impact) games are going to somehow “change the world”, saying how such a notion expects far too much from games. Other forms of critical media such as documentary films or non-fiction books are not subject to such grandiose speculation, so why are games? Games for change already provide unique a value to our world that is often overlooked – they teach the critical 21st century literacies of complex systems, design, and play. Using them as vehicles for injecting content to players, instrumentalizing them, fails to appreciate their inherent value as a cultural medium. In light of this danger, Zimmerman contends that games should not be assessed by their effect. Such an approach is a reductive, and detrimental to the overall positive potential impact of games. His position opposes the popular idea that a social impact game’s effectiveness can be assessed in relation to the intended outcomes set out during the game’s design process (see Swain, 2007). From Zimmerman’s perspective, a successful game should have uncertain results.

Overzealous hopes that games can change the world and risks of game instrumentalization aside, design literalism is what Zimmerman (2013) views as the biggest problem facing social change game designers in contemporary culture. A ‘design literalism’ problem involves game designers thinking they literally have to simulate and/or accurately depict their subject matter to do it justice. My father, for example, fell into the design literalism trap with his first attempt at a game design concept for nuclear disarmament, as described in my opening story. This was the concept where he said frustration would be the “whole point of the game”. The one where, “Players experience what it’s like for the people carrying the nuclear disarmament today, trying to keep it alive when no one seems to care.” *No offence dad, but people play games because they are fun, and this game does not sound even the slightest bit enjoyable.*

Most serious games today are approached as either ‘simulation’ or ‘satire’, Zimmerman points out, and neither approach allows for any complexity, range and/or ambiguity of emotional responses The antidote to this limiting game design dualism? Trust games

more as a medium, stop trying to control what players learn, embrace expanded notions of play, ask plenty of questions, and view games as a place for exchanging ideas (Zimmerman, 2013). Social impact games are so much more than another way to transmit information. If designed with enough care, insight and reflection, impact game can be a way to engage the complexity of human experience.

Theorizing 3MtM Game Design

Many questions arise within the *3MtM* speculative design project: What makes it a game? Why is it so important that it is a game? Can the rules of a game be ambiguous? Do there have to be winners? At what scale does the gameplay occur? Can the game be so large scale that it is only “won” once a real world change occurred, such as with the *Investigate Your MP’s Expenses* game? Can a game still be fun without the concept of individual winning? Can a game based on collective action be addicting? Does playing with future make it easier to create?

In many ways, *3MtM* asks us to stretch our imagination in terms of what a ‘game’ can mean. For example, the speculative design of *3MtM* requires the boundaries of Huizinga’s magic circle to include the physical grounds that house the world’s current stockpile of 17,000 nuclear weapons, so that players can imagine those spaces rid of such weapons. The design straddles a perspective somewhere either between procedurality and ludology, or beyond both of them. It is a game interested in designing play to *be* a productive process, so the meaning of game derives from both the intentions of those who created it, *and* the intentions of those who play it (Sicart, 2011). In *3MtM*, players are encouraged to create new rules as the game evolves, and designers are encouraged to delete old rules that no longer serve the game’s development. When philosopher Bernard Suits said that “rules are the crux of the game”, *3MtM* was not the kind of game he was referring to. Brathwaite and Sharp’s (2010) proceduralist argument from the article “The Mechanic is the Message” struggles to hold true when applied to the *3MtM* context: “The rules of the game are the game,” they write. “The pieces, the parts, the board? The table, computer or console? They are all there for one reason only – to allow us to play out the rules”

(p.317). The game does make sense, however, in terms of Flanagan & Nissenbaum's (2008) semi-proceduralist statement that games are a cultural medium embedded with values and belief systems, whether intentional or not. This is why the authors argue that, "intentionally embedding values [...] stands a better chance of creating socially conscious games" (p.265/266), than leaving the production of a game's values to happenstance. Relatively speaking, it is perhaps Eugene Fink's more open and existential perspective of games in terms of play, that best suits *3MtM*'s experimental approach: "From the beginning play is a symbolic act of representation, in which human life interprets itself" (1988, p.107, quoted in Sicart, 2011, p.9).

Powers, Potentials and Permissions of Play

The expressive powers, productive potentials, and exploratory permissions afforded through play are what help transform games into the spaces of innovation and invention necessary for creative solutions to pressing social issues. In his seminal research on the psychology of play, Hungarian psychologist Mihaly Csikszentmihalyi – aforementioned for developing the concept of flow – concludes that "what play shows over and over again is the possibility of changing goals and therefore restructuring reality." Game scholar Mary Flanagan (2010) expands Csikszentmihalyi's important insight with her concept of 'critical play'. Flanagan describes critical play as the process of exploring complex issues through gameplay. She argues that games are well suited for exploring unfamiliar complexities because of the space play opens for rethinking reality; play allows us to try out new structures of being with a sense of lightness and experimentation. Through play, human values and goals, simultaneously revealed and redirected without resistance let alone reflective awareness, are exposed for their inherently fluid and malleable nature. Critical play recognizes the power in this affordance of play, and what it might mean in terms of social impact game designs. The experience of permission, freedom, openness and imagination accessed so readily through play is one of the most important reasons why *3MtM* is designed as game, as opposed to any other cultural medium.

CONCLUSION

In many ways it is ironic to write a paper about advantages and affordances of digital media rather than create an interactive online multimedia space to showcase the research. The *3MtM* speculative design project is more a collection of connected ideas than a finite distillation of them. This connected collection of content is far better suited for the circular and networked format of content displayed in digital space. Ideally, this document would be filled with hyperlinks, GIFs, and video clips, allowing readers to interact with the referenced content, to experience it. Reading about the project conveys only a part of the message; the other, larger part of the message comes from the interacting with digital media. But for now, reading through the content is a fair start.

As a medium, digital games help us see the world's structures and struggles in terms of complex systems, where the whole is always greater than the sum of its parts. In a new industry report game design leader Katie Salen remarks: "Games as a form of media will undoubtedly have taken on a range of new meanings in ten years, but play will always be the engine that drives their engagement" (ESA, 2016, p.2). As a digital game, *3 Minutes to Midnight* strives to offer players with opportunities for critical playful engagement with the international nuclear disarmament movement. As a speculative design, *3 Minutes to Midnight* strives to be a design solution that is, in the words of James Auger (2013, p.4), "complex and contradictory: provocative whilst the same time familiar."

APPENDIX A

Original Game Concept Document, December 2015

Three Minutes to Midnight

by Nathalie Down & Eyal Assaf

INFECT THE WORLD WITH AWARENESS. YOU HAVE 3 MINUTES LEFT BEFORE NUCLEAR ANNIHILATION.

Concept

Three Minutes to Midnight (3MtM) is a Serious / Alternate Reality Game (ARG) in that it addresses a very pressing social issue using an ARG platform. The goal of the game is to raise real world awareness of the imminent nuclear threat we face as a planet. The method is an exciting viral gameplay that leverages social media behaviours and mobile communication technologies. Following the This Is Not A Game (TINAG) concept, 3MtM does not provide a defined set of rules or limits to playspace. Rather 3MtM specifically states that "The World is Your Game Board, The Virus is the Message, Social Media is the Medium". It strives to use the potential for games to "act as a tool for empowerment, community building, collaboration, and cultural change" (Flanagan, 2007, p.1). Similarly to the 2007 serious game A World Without Oil, 3MtM relies on creative input from the player base to evolve, spread and develop. Players who "infect" large numbers with the Message or who contribute superior media surrounding the message are rewarded with points, awards and recognition. The ultimate goal is to raise awareness of how close our world is to extinction based on the Bulletin of Atomic Scientists' Doomsday Clock, currently set (2015) at reading of 3 minutes to midnight, and to spark real world action to set the hands back to a safe distance. The success of the game is measured by how many people become infected with the Message in a given period of time, and the real world actions taken towards nuclear disarmament and non-proliferation.

Premise

In order to raise the global consciousness of the dangers presented by nuclear weapons, a message of awareness and hope (the **Message**) has to be transmitted as quickly and efficiently as possible via social media. Using a global viral pandemic scenario, the players have to try and "infect" as many people as possible with a knowledge *virus* that carries the Message within it. In other words, the world is the game board, the virus is the Message, and social media is the medium.

Game Mechanics

Through the use of available social media and the 3MtM website (“Command & Control”), the players have to pass on the Message – including education on the dangers of nuclear weapons or leading events dealing with the game premise - to other players in their social networks. For every x users "infected" with the Message, the player gets CAWS (*Citizens Alliance for World Survival*) points. These points can be then used to unlock additional game elements on the 3MtM site.

A world map will show in real-time the spread of the "infection" based on social media analytics collected from the players. Infection spread rate can be calculated based on Likes, post shares, tweets and retweets (among other social media sharing tools).

In order to keep the game engaging, optional mini-games related to the topic will be available on the 3MtM site. These games will include genres such as puzzle, strategy, action and adventure. Successful completion of these mini-games will provide the players with additional CAWS points.

Note: the use of Command & Control terminology is ironic considering its uses in the military in relation to nuclear and tactical weaponry.

Game Content, the 'Message'

The current reality our world faces is more urgent than any fictional game play scenario. The 'urgent optimism' characteristic of game players must be applied to a real life game board to ignite global awareness and engagement in the struggle to eliminate the threat of a nuclear apocalypse. All of Life is a stake. The current information available is widely unknown, as it has fallen out of favour. However, once people are 'infected' with the knowledge - the Message, they can't help but be alarmed, deeply concerned, urgently impacted to take further action.

In the game, the 'Message' is constantly evolving, as there are so many important facts about nuclear threat to be shared. The 'Message' is always rooted in credible research and knowledge, and is meant to both educate, to alarm, and to ignite Action. For example, the fact that there are 2,000 nuclear warheads currently on 'hair trigger alert', meaning that 15 minutes is the countdown for utter destruction, could be a Message. Each Message could also have possible direct Actions. As the Message spreads, it leads to a specific Action calling for a campaign to change this, e.g. to de-trigger such hair trigger weapons. Transmitting a Message that linked to Action would earn greater points, recognition and awards.

Game Elements

A meme to be used to represent the 3-minutes concept is the **W** symbol made with the 3 middle fingers of the left hand covering lips (see Image 1).

This meme symbolizes:

- **3** minutes to midnight
- **World War 3**
- Awareness of Nuclear) **W**arheads / **W**eapons
- Prison bars preventing freedom of: **i**) thought, **ii**) speech and **iii**) expression

Images and photos of players using this meme can be used as “proof” to the spread of the 3MtM infection. These can be posted with the hashtag #3MtM on Facebook / Instagram / Twitter.

Another dimension to add to the 3MtM game are trackable IDs. These IDs can be generated through the 3MtM site in the form of QR codes or barcodes. Players will be able to print or scan them and incorporate them with physical objects (e.g. stickers, postcards, videos, tags). As those IDs get scanned, they will get uploaded to the 3MtM site and will show the progression of the Message across the world (see Image 2).

Platform

The game will be multiplatform. A mobile app will push news and updates to the player as to the status of the “Message” and its impact on the globe. Players will also be able to keep track of their progress via the app. As well, a dedicated website will act as the main game’s hub. It will provide in-depth information on the current game status, as well as educational and current geopolitical events related to the game’s message. Our goal is to make it as accessible to all players. The mobile platforms will include iOS, Android and Windows Phone. The website will be available on all current browsers.

Educational Value

3MtM's innovative approach to game play is designed to spread viral awareness about the dangers humanity currently faces, and thus launch real world action about how to address these dangers. Research shows that games ignite within player a sense of 'urgent optimism', 'social fabric', 'blissful productivity', and 'epic meaning' (McGonigal, 2010). These are precisely the senses that are needed to tackle the greatest threat to human civilization - nuclear weapons.

The instant access and viral potential of social media content provides a perfect medium for combining digital games and real world action in a completely new way. We need new approaches that speak to the digital generation. We don't have time to try the same old ways.

We need to be creative. We need to enjoy saving the world. For the first time 3MtM provides us with such an opportunity.

Recent tragic events around the world again prove how social media plays a major role in quickly disseminating information to an extensive audience. By using this methodology, we aim to engage our players and pass on the message of awareness to the very current and present dangers nuclear weapons pose to our global existence. Social media is the voice a generation, so 3MtM uses this voice to speak the message of every generation - the right to life.

Taking a page from successful viral campaigns, the game can start with short cryptic teaser messages posted in social media (see Radde, 2008). The goal is to get people to talk about the issue, to get conversations started on this topic, to educate themselves and educate others. The game has to become "a thing" that will generate curiosity among the players. Also, since the subject matter is so timely, critical and important, we do not want to alienate potential users with unnecessary technical complexities. The 3MtM game has to be very accessible and be able to reach anyone and everyone.

The social media format presented does not limit the ability of the Message to be relayed. It creates the first step of awareness to the situation, and answers the requirements of this project. The Message of nuclear threat is unique in that it does not require empathy or critical thought to understand how it would impact any person. While the current dangers are rooted in ideological wars, the impacts of nuclear warheads are the ultimate equalizer. All of life is subject the devastation. In 3MtM, players really can have the ultimate epic meaning - they can save the world.

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Image #1

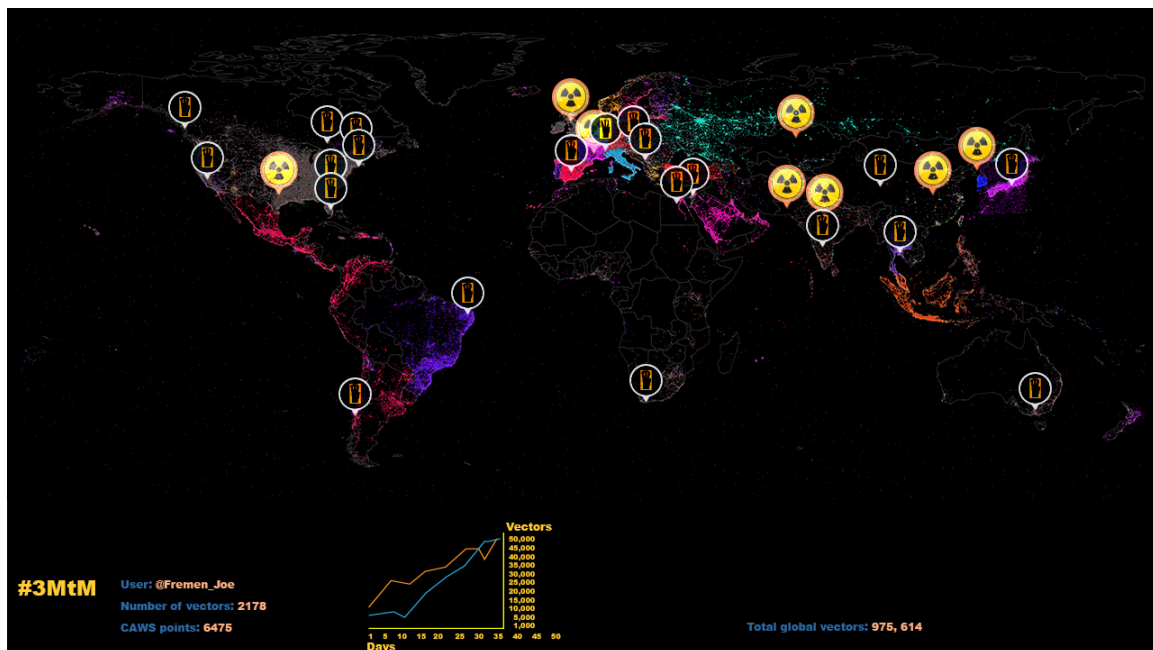


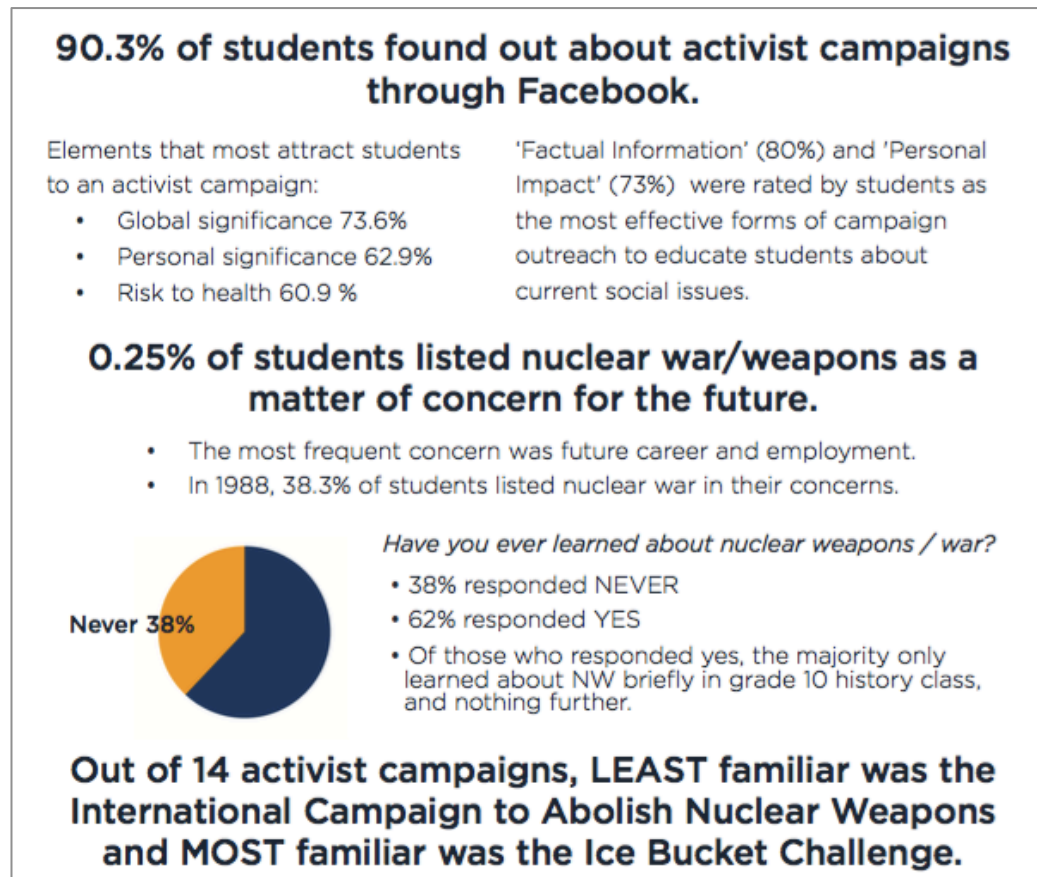
Image #2

APPENDIX B

Undergraduate Student Assessment: Identifying the Current and Relative State of Knowledge of and Interest in the Risks of Nuclear Weapons

The following findings are from an original research study by University of Toronto student Nikki Shah, under the supervision of Dr. Vinay Jendal. Shah presented the findings during a joint panel with *3MtM* at Pegasus Conference on May 14, 2016.

The study surveyed 400 UoT undergrad students from various disciplines and year-levels. It aimed to identify the current and relative state of knowledge of and interest in the risks of nuclear weapons. A study of this nature has not been conducted in Canada for at least two decades. The study reveals:



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