

**YOU ARE NEVER LONELY WITH A ROBOT: A QUALITATIVE
CONTENT ANALYSIS ON THE USE OF ANTHROPOMORPHIC
TECHNOLOGIES**

By Julianne Jakobek

A thesis submitted to the Department of Sociology
In conformity with the requirements for the degree of Masters of Arts

Queen's University
Kingston, Ontario, Canada
May 2019

Copyright © Julianne Jakobek, 2019

Abstract

Loneliness is understood as the perceived unmet desire for human attachment. In recent years, there has been a growing concern surrounding loneliness that has prompted many to consider ways to remedy the issue. Presently, there have been many developments in technology wherein there is a focus on creating human-like characteristics. Known as anthropomorphic technologies, their increasing capability of providing human-like functions, allow them to be suited to alleviate the issue of loneliness. This is a qualitative content analysis that considers whether or not these technologies are successful through various case studies. The case studies focus on social robots, dating sims, and virtual reality, and were chosen based on the likelihood of being able to replicate human attachment. Due to the nature of this study, there are several ethical and social implications surrounding the idea of the non-human that arise.

Table of Contents

<u>Abstract</u>	ii
<u>Chapter 1: Introduction</u>	1
<u>Chapter 2: Methodology</u>	4
<u>Chapter 3: Genealogy of Loneliness and Theory Review</u>	12
<u>Chapter 4: The Genealogy of the Non-Human and Anthropomorphic Technologies</u>	41
<u>Chapter 5: Case Studies</u>	52
<u>Chapter 6: Discussion</u>	77
<u>Chapter 7: Conclusion</u>	89
<u>References</u>	95
<u>Appendix</u>	103

Chapter 1: Introduction

The feeling of loneliness has been characterized as an epidemic. Loneliness has been associated with multiple health conditions such as the increased risk of depression, anxiety, elevated blood pressure, the progression of Alzheimer's and diminished immunity (Cacioppo et al 2009: 978). Previous research done on loneliness has considered causes such as living alone and various societal factors, like Freshman leaving for college, as reasons for individuals experiencing loneliness (ibid). This has prompted various countries to consider loneliness policies as it affects more than just the health sector. Britain for example has named Tracey Crouch as their loneliness minister in 2018, acknowledging that loneliness has had a "multibillion-dollar toll on the UK economy" (Kiron and Unruh 2018). Named the "Jo Cox Commission", Prime Minister Theresa May hopes the commission, named the "Jo Cox Commission" will help solve the issue of loneliness, as it cuts through all levels of society, and affects more than 9 million people in the UK alone (Baynes 2018).

In correlation with the rise of loneliness, there has also been a rise in technology. Anthropomorphism is the attribution of human-like characteristics to non-human entities; currently, anthropomorphic technologies have taken center stage, as engineers attempt to attribute human qualities to non-human entities. Since at its core, loneliness is an unmatched desire for human connection; and anthropomorphic technologies are technologies that possess human-like characteristics; anthropomorphic technologies can be used to alleviate the issue of loneliness. This project employed a qualitative content analysis approach to analyze the experience of loneliness, its causes, and the use of anthropomorphic technologies to alleviate loneliness and its symptoms.

Several case studies were used to analyze the use of anthropomorphic technologies, and its capability of providing human-like attachments, that lonely people perceive they are missing. It was found that the varying uses of anthropomorphic technologies, such as social robots, dating sims, and virtual reality, do have the ability to alleviate loneliness; but that their capacities were limited by culture. In other words, the case studies indicated that despite these technologies alleviating loneliness, that some cultures such as Japan, are more receptive to their use, than other cultures such as the US. One of the reasons for this is the differences in how cultures perceive non-human entities. However, despite this, technology continues to be part of the future, and thus this research provides several avenues of inquiry to research the ongoing and increasing entanglement of humans and technology.

The following research outlines how anthropomorphic technologies can have a positive influence on alleviating loneliness and its symptoms. The first part of the thesis will cover the genealogy of loneliness, in order to contextualize loneliness, and loneliness theories, in order to understand the main causes and symptoms of loneliness. The second part is the genealogy of the non-human, and more specifically of anthropomorphic technologies. Similar to the loneliness genealogy, this section aims to understand the origins of the idea of the non-human, to understand how historically humans interacted with the non-human, but human-like entities. Starting with the history of the development of robots, this section concludes with the development of artificial intelligence and virtual reality. The two genealogies are the background to the following section: case studies. Chosen in light of loneliness, the case studies are examples of human-like technology, that are capable of replicating human attachment. The three main categories of the case studies are: social robots, dating sims, and virtual reality. The following discussion section deals with the barriers of these technologies, as well as the nature of the

varying attachments humans can make to these technologies, and the social and ethical implications that ensue.

Chapter 2: Methodology

Inspired by Steven Shaviro's account of Gwyneth Jones' "The Universe of Things"; Shaviro recounts the fictional story of humans coming in to contact with aliens, known as Aleutians. With their description of both human and Aleutians, and of their contact, Shaviro made me think about the difference between the human and the non-human. The description that Shaviro gives of the Aleutians made me think specifically about the recent development in robot technologies, and how technology, in general, has taken a large role in society all over the world. Shaviro describes how horrified humans were to discover that the aliens' tools were "intrinsically alive" and they were extensions of the aliens themselves (2011). I found that despite their reaction, this was representative of technological advancements today.

Anthropomorphic technologies, such as social robots, dating sims, and virtual reality are becoming more like us humans, and being used in more countries – despite the initial shock. These technologies encapsulate Shaviro's description of the development of the non-human being "alive" and that objects are no longer "dead" (2011). Since lonely people desire quality attachments to other humans, I ask the question – would human-like technology suffice?

Research Questions and Modifications During the Research Process

The first step of my research was investigating where anthropomorphic technologies were being used, and in what capacities. At this point, my research consisted mostly of documentaries on loneliness and anthropomorphic technologies, a list of which can be found in the appendix. Japan, in particular, stood out to me, as it leads globally in the research and production of technology – especially robots. Here I found many cases pertaining to the use of anthropomorphic technologies, as well as the general view of loneliness in Japan. I found that

there were several differences between Japan and the West, and that on the outside, one is more receptive to the use of anthropomorphic technologies than the other. I was able to come to a few conclusions: 1) that loneliness is a feeling and is experienced when there is an unmet desire of close relationships 2) lonely people need human interaction 3) there are specific technologies aimed at being human-like, which we call anthropomorphic technologies 4) cultures experience loneliness differently and 5) different cultures react to the use of technology differently. These conclusions led to my research questions: what are the causes of loneliness? Can anthropomorphic technologies fix loneliness? What is necessary for these technologies to work? Does this, and should this change our understanding of the social and what “non-human” means?

I hypothesized that due to the growing development of human qualities and traits in anthropomorphic technologies, they can be used to alleviate loneliness, insofar that the individual using them is in a culture that is receptive to these technologies.

Research Method: Qualitative Content Analysis, Genealogy and Grounded Theory

This project employs a qualitative content analysis approach, that uses principles from Foucault’s genealogy method, and grounded theory. First, the qualitative content analysis was used since it allowed for flexibility when collecting and analyzing data (Hsieh and Shannon 2005: 1277). Throughout my research, I systematically engaged with text and media, which then led to coding units. This method was chosen over quantitative research, such as conducting surveys, since there was limited research in this area. Therefore, I opted for a more exploratory research method, since I had limited knowledge on the topic. I found that by allowing for flexible coding I was able to not only gather a large amount of information, but also able to categorize it in a comprehensible manner.

The second step of my research was where I employed Foucault's concept of genealogy. Inspired by Nietzsche, Foucault created an investigative method to critically analyze the present through the past; Foucault states, "I set out from a problem expressed in the terms current today and I try to work out its genealogy. Genealogy means that I begin my analysis from a question posed in the present" (cited in Garland 2014: 367). Foucault's approach to genealogy uses the concept of *problematization* as a way to focus the genealogical analysis (Koopeman and Matza 2013: 827). In *Discipline and Punish*, Foucault's "problematization of discipline established a deep set of motivating constraints that facilitated the emergence of new practices of punishment in the eighteenth and nineteenth centuries" (ibid). In the context of this thesis, the problematization is how we view loneliness, as well as our views on the use of technologies, specifically looking at robots. "Problematization, which is to say, an identification of how a specific phenomenon (...) came to be regard as a specific kind of problem for specific authorities at a specific point in time" (Garland 2014: 378); for me, the problem was this: why is loneliness considered an epidemic? What has changed in society to make us feel so lonely? Why are people not using technology to their advantage?

In order to critically analyze and understand the present issue of loneliness, and the use of anthropomorphic technologies to answer whether or not loneliness can be fixed, I considered their genealogies independently. I followed Foucault's recognized genealogy approach to answer my research questions. By considering the past, I am able to rethink the present. Genealogy is a methodological device that I used to consider the problem of loneliness, and the problem of anthropomorphic technologies becoming more human-like and blurring the lines between the human and non-human, and ultimately if anthropomorphic technologies can fix loneliness.

The genealogy approach is important for my research since it is, “an attempt to outline a possible account for the origin of a phenomenon” and thus it recognizes a “multitude of narratives of its descent” (Christensen 2016: 765); this is relative to my research as I understand there are many different ways to understand the concept of loneliness and the non-human. However, this approach is still useful as it provides the necessary framework of critically evaluating the value and meaning of these concepts and issues; and how they are shaping our present. I believe that “the idea of using history as a means of critical engagement with the present – a concern expressed in his conceptions of ‘genealogy’ and ‘history of the present’” was necessary for the research I did (Garland 2014: 367).

The third step used grounded theory; a “research approach in which a theory, an explanation for what is happening, develops from the information collected systematically during the research process” (Harris 2015: 32). My project started with research questions that started a qualitative content analysis, but also led to a genealogical approach. However, in order to be more specific, and analyze the growing data I used grounded theory; it is different from other kinds of qualitative approaches, as it seeks an explanation, not just a description as to what is going on; and therefore, it can be used to inform future research projects (ibid: 33).

The grounded theory approach was especially relevant in the development of my case studies section. Since grounded theory allows for flexible coding stages, I used open coding; which is “the process of identifying and creating a label for ideas and assigning text segments to these codes to develop an initial framework for further analysis” (Schulenberg 2016: 315). By open coding, I was able to create categories for the case studies, which were chosen based on perceived ability to create human-like attachment; and further, categorize the issues found in the cased studies.

I only use principles of grounded theory since, grounded theory implies that “there are no preconceived ideas about what is happening to guide the research process” (ibid: 32); and this did not apply, as I did have preconceived ideas about loneliness and the use of these technologies.

Thus, the research method is a qualitative content analysis, that uses principles from the genealogy approach and grounded theory; this allowed for a wide array of data to be collected, which led to broader conclusions, and many possible avenues for further research.

Data Collection

The first step of my data collection was a preliminary inquiry into loneliness and anthropomorphic technologies. I decided to watch documentaries on these issues in order to achieve a broad understanding of the topics; all of which are listed in the appendix. The documentaries I watched all centered around interviews, which gave me a first-hand look at: individuals who identify as being lonely and their experiences, individuals who do not consider themselves lonely and why, individuals who own sex dolls and robots, individuals who manufacture sex dolls and robots, individuals who are involved in virtual reality programming, specifically virtual porn, companies who manufacture virtual porn and the subsequently sex technology to go with it, and individuals who have experienced and are part of Japan’s underground sex industry. These documentaries opened up my research to include more than just robots, and more to look beyond Japan. It also provided new search terms to consider, like “virtual porn” and “dating sims”.

With limited knowledge on the topic, I began my qualitative content analysis in order to seek answers for my research questions. I engaged with media but also various texts such as:

newspaper articles, journal articles, dissertations, books, blogs, and websites. Despite all the information on loneliness and anthropomorphic technology, I noted a gap in my research, which was that I did not understand how either loneliness or non-human entities became problems. In other words, loneliness and non-humans were two concepts that were being used, but their understanding of how they came to be understood as they are today was not clear to me. This, coupled with my research questions, led me to the genealogies of both loneliness and the non-human. This impacted the data I collected, which were mostly historical accounts of these phenomena. Furthermore, it was at this stage that I chose to focus the issue in the West, since I realized the genealogies varied, and that one understanding of loneliness or the non-human does not pertain to every culture.

Once I had established the genealogies, I was able to consider what data was to be collected based on my understanding of loneliness, as well as the human relationship with the non-human, and the issue of culture. The data I collected varied here from journal articles to blogs that described the use of these technologies. It was at this stage that data collection was influenced by grounded theory. I had accumulated data about the use of these technologies, and then used grounded theory to create categories such as social robots, dating sims, and virtual reality. These categories became the case studies, as they demonstrated the ability of anthropomorphic technologies being able to create, or replicate human-like attachment, that lonely people perceive to be missing. As I collected the data, I was also analyzing it which led to further categories such as the ethical implications that arose out of the use of these technologies.

Document Type	Years	Number of Documents
Documentaries	2011-2016	6
Newspaper	2004-2019	10
Websites	2012-2019	8
Books	2001-2018	10

Journal Articles/Studies/Dissertations	1962-2018	95
---	-----------	----

Data Analysis

As aforementioned, my research methods both collected and analyzed data, at times simultaneously. Thus, it is difficult to separate the two. However, what was necessary when analyzing the concepts of loneliness, and the non-human, was the use of actor-network-theory (ANT); “a loose intellectual toolkit or sensibility, something that could help to sensitized the researcher to complex and multiple realities which might otherwise remain obscure” (Nimmo 2011: 109). As shown in the genealogies, both concepts have multiple understandings which can change based on culture.

This affected the conceptualization and operationalization of the two concepts, which affected how my data was collected but more so, how it was analyzed. The conceptualization of loneliness was informed by my understanding of loneliness, which influenced how it was operationalized. As I understood loneliness as the unmet desire for humans to form social connections, the key dimensions of loneliness were the unwarranted sad feelings that are associated with loneliness, which characterizes the experience of loneliness. As I analyzed the data, it became apparent that there are multiple causes of loneliness, as well as multiple ways one can experience loneliness. This was important for my research since ANT allowed there to be multiple outcomes, as there is not one way of understanding the issues presented.

This was also the case with anthropomorphic technologies, which were conceptualized as technologies that possess human-like qualities. They were operationalized by considering what human-like qualities they possess. The key indicators were human-like: body parts, cognitive abilities and emotional attachments (such as intimacy). ANT was used to consider the variations

of human characteristics – thinking beyond the robot. Furthermore, more generally, ANT was crucial in understanding the concept of the non-human. The historical interactions of humans with non-humans in the West are so different when compared to Japan; thus, it was imperative as a researcher when analyzing the non-human, that I had to be open to the idea of the non-human being more than just an object, since that would limit my understanding of the concept.

Chapter 3: Genealogy of Loneliness and Theory Review

In 2016, the movie “The Age of Loneliness,” directed by Sue Bourne was released. In this film, Bourne interviews multiple individuals of varying age, gender, and race in the UK. Bourne’s goal is to find a way to articulate and understand loneliness, because she, amongst others, considers loneliness a “silent epidemic” that threatens humankind (Bourne 2016). At the very least, loneliness is a serious health concern that requires our attention (Bourne 2016, and Snell 2017: 4). For example, many studies have shown that loneliness has been associated with: high blood pressure, the progression of Alzheimer’s, obesity, diminished immunity, alcoholism, depression, and cardiovascular issues, amongst other illnesses and conditions (Cacioppo et al 2009: 978; Snell 2017: 4). Bourne also argues that what adds to this epidemic is our reluctance to talk about loneliness, especially among those who feel lonely (ibid.). How can one describe or define loneliness? A non-tangible feeling we have all no doubt felt at one point in our lives. How can one word encapsulate a plethora of emotions? How can it describe the difference between a young child homesick at an overnight camp and an elderly widowed person longing for the person they spent their life with? While loneliness is a complex concept and feeling, for the sake of simplicity, we’ll use Bouwman et al’s cause for loneliness, which is as follows: “Loneliness stems from a mismatch between the social relationships one has and those one desires” (2017: 793). Therefore, loneliness can be defined as a subconscious, unpleasant feeling that one feels when they lack genuine social relationships. In this sense, and in all the ways we understand loneliness, we can deduce then that it has consequences not only for the individuals who experience it, but for society as well (Bouwman et al 2017: 793).

When trying to understand loneliness, it is important to distinguish between being alone and feeling lonely. Put simply, one can choose to be alone, but one does not choose to be lonely.

For example, in Bourne's documentary, one of the participants chose to live a life secluded from others and thus they live alone. However, the participant makes it very clear that despite living alone, far from anyone else, they do not feel lonely and opted to live this way. This is an important distinction, since loneliness is not something an individual can change when they want to. As summarized by Ferreira:

Aloneness is active and therefore potentially constructive. Loneliness is passive and ultimately destructive to the self. The individual who withdraws into his room on his own or goes by himself into the wilds of a jungle, the cell of a convent, or the Babel of an unfamiliar country, experiences aloneness as a feeling-state he sought and wanted, and from which he can emerge at will, conceivably satisfied and possibly stronger. But the feeling-state of loneliness precludes any anticipated reward. Loneliness is isolation, but of a kind the organism dreads and could not possibly seek. It is a severance from every other human being. It is the ultimate in feeling rejected, for it is feeling rejected by everybody. It is being an unwelcome guest in every house, forever a foreigner in every land (...) it is non-existence (1962: 202).

As demonstrated by this quote, being alone and feeling lonely are two very different concepts. However, they do intertwine, as Snell points out, there is an objective and subjective aspect to loneliness (2017: 4). Objectively, one can be alone and not be lonely (Snell 2017: 5). However, there is a causal relationship between being alone and being lonely (ibid.). Subjectively, one can feel lonely despite not being alone (ibid.) Put simply: one can be alone and not be lonely, or one can be in a room full of people and feel lonely. This is similar to Bouwman et al, and their differentiation between emotional and social loneliness. Emotional loneliness occurs when there is a "lack of intimacy" either with a partner, close friend, or family (Bouwman et al 2017: 794). Social loneliness occurs when there is a lack of a "wider social network for companionship" (ibid.). Therefore, it can be argued that loneliness affects us mentally as well as physically, and that, despite the fact that being alone does not mean we will necessarily be lonely, we cannot deny that as humans we are social species who need the presence of meaningful, close interactions.

Genealogy of Loneliness

There is no real history of loneliness, but I will demonstrate that there is evidence that loneliness is not a new concept and has existed and manifested itself in different ways throughout time. As we will see, “loneliness is socially structured as an event and experience but also a distinct way of being, signposted through behavioural codes, that involves a perceived rejection from specific (often multiple) social groups” (Alberti 2018: 244). This section will show how loneliness is understood and expressed differently throughout time. It is noted that this research focuses on Western accounts of loneliness.

Writing on loneliness can be traced back to 2100 BC, with the “Epic of Gilgamesh” which is considered to be humanity’s oldest work of literature (Kline 2016: 24). From ancient Mesopotamia, the Epic of Gilgamesh, tells the tale of Gilgamesh, the ruler of Uruk, and his obsession with immortality, and his quest to achieve it. Gilgamesh’s solitary quest to fight his fear of mortality, can be understood as a universal feeling of alienation and fear of loneliness; as described by J. Harold Ellens, “all healthy humans, at the center of their psyches, feel a certain isolation and alienation from the ground and source of our existence” (1997: 222). This “existential loneliness” as described by Ellens, permeates the ancient Hebrew text of Genesis (2:25-3:24). This existential loneliness resonates the same alienation felt in Gilgamesh, wherein humans struggle between the “potential for a paradise-like existence as idealized persons” and “our actual capacity to create a wholesome world” which was not compatible with the realities of life (ibid.) The feeling of loneliness, of isolation and alienation is a theme found in some of the earliest literary works.

Discussions of loneliness can be traced back to Plato and Aristotle and other philosophers of that time, which was around 400 BC. Aristotle noted that “no one would choose the whole world

on condition of being alone since man is a political creature and one whose nature is to live with others” (Aristotle cited in Ferreira 1962: 201). Despite the fact that Aristotle uses the word “alone” and not “loneliness,” it is implied, that naturally, human beings want to be part of meaningful relationships and that wanting companionship is innate within us. Furthermore, Plato’s *The Symposium*, written around 385-370 BC recounts several speeches by other philosophers including Socrates, and Aristophanes also touches on loneliness. Erlich notes that in Plato’s *Symposium*, in which the original human beings were described as of three genders:

Male, female, and a combination of the two. These early creatures were made up of double their parts, including their genitals. This condition lasted until the gods decided to cut them in two, “like a sorb-apple which is halved for pickling” (Freud 1920 cited in Erlich). After they were separated, each half missed the other half terribly, until they would embrace each other and wish to reunite again (Erlich 1998: 139).

Arguably this exemplifies the feelings of loneliness and how we understand it today. This speaks to the perception that alone we do not feel whole, we feel lonely; but surrounded by quality relationships, we do not feel that way, which is why we want to be around others. Plato’s description of the original human beings (mentioned above) is arguably a theory of love: alone we are only halved creatures, and thus “we are creatures of lack, but we long to be complete, to be one with our ‘other half’” (Sandford 2010: 43).

This idea of not being perfectly whole without someone else, and feeling the need to be with someone else, recurred throughout time. Take, for example, the Bible. The most obvious example is Adam and Eve. As noted by Shmuel Erlich, in the biblical texts of Creation, God creates Adam and afterwards “God saw everything that He had made, and behold, it was very good” (Genesis 1:31 cited in Erlich 1998: 138); therefore, in this sense, we understand Adam, or man in general, as having been perfectly created, independent and “self-supporting” (Erlich 1998: 138).

However, shortly after this God decides that Adam is not so perfect or independent, and that he is in need of something or someone else: “It is not good that the man should be alone, I will make a help meet for him” (Genesis 2:18 cited in Erlich 1998: 138). And just like that, we have Eve, and Adam is no longer alone; “the creation of Eve, the woman-mate or “help meet” is the corrective for man’s imperfect loneliness” (Erlich 1998: 138). Erlich argues that due to the existence of loneliness in some of the oldest texts, that the fear of loneliness is then “fundamental human trait and characteristic” (ibid).

The history behind the word loneliness is complicated. As noted by Erlich, “in biblical Hebrew, there is a noun for the state of *being* alone, “badad”, though there seems to be no form for directly expression the more complex effect of loneliness” (1998: 134). Nowadays, Hebrew has the noun “B’didut,” which can be understood as loneliness. But again, as noted by Erlich, “in both instances, the etymological root *b’d* connotes ‘separation’ and ‘singularity,’ the derivative *boded* connotes ‘solitary’ or ‘solitudes’” (ibid).

When researching the origins of the word loneliness, Alberti notes that it is not until the 18th century that the term was being used frequently (2009: 244). Furthermore, in the 16th and 17th centuries loneliness was not understood the way we know it today; “loneliness meant simply ‘oneliness’ and it was less a psychological or emotional experience than a physical one. Oneliness meant simply the condition of being alone” (ibid). Alberti’s research also indicates that the words lonely and alone have been used since the 1600s, as seen in the literature, such as dictionaries and plays, with their meaning usually centering around being solitary or alone (2018: 245). Arguably then, we see that loneliness is understood in a shallow context historically, one that is connected to being alone, which I previously argued is not loneliness in its entirety, although it can contribute to the feeling.

Despite the lack of the word ‘loneliness’, the feeling of loneliness as we understand it today permeated throughout time, as we have seen above in terms of the Bible and ancient philosophers. In medieval times, “the medieval man feared above all to be estranged from God, to have his thoughts alienated (vain prayer) from the inclusive, reflective light of God’s perfect comprehension” (Mijuskovic 1985: 13). This is important since loneliness is not simply vanquished once you have someone, a partner, since the threat of separation always looms in the distance (ibid: 12). Loneliness, as described by Mijuskovic and seen here with the medieval man, also speak to a more complex longing and “the inevitable structure of self-awareness which grounds the desperate attempts of each of us, separately, to transcend our mental prison by seeking refuge through communication with another reflexive being” (1985: 13).

At the end of the 1500s, Shakespeare wrote *Hamlet*; which despite the play being infamous for the introduction of the soliloquy (a monologue performed by one character who is seemingly talking to themselves, thus allowing the audience insight into their mind and feelings), it was also the first recorded time the word “loneliness” was used by Shakespeare, and one of the “earliest references to the concept in all of English literature” (Worsley 2015: 521). It was not within Hamlet’s soliloquy though that the term loneliness is displayed, but rather it is introduced through the quiet, and lonely character of Ophelia (ibid). In Act 3, scene 1, Polonius speaking to Ophelia says, “Read on this book, that show of such an exercise may colour your loneliness.” Thus, the characters themselves in the play are alluding to Ophelia’s loneliness, but there is more to it than just lines; As described by Worsley, Ophelia is lonely and is associated with “loneliness” because:

By refusing the convention whereby solitariness is an occasion for self-revelation, she exposes the conceit of the soliloquy form: no character can be truly lonely when communicating with an audience, whether or not they speak directly to them. Because

Ophelia withholds her thoughts, she is less readable and more isolated onstage than Hamlet is (Worsley 2015: 525).

This depiction of loneliness is notable since, before Ophelia, characters such as King Lear and Richard II were outwardly lonely characters and while the audience watches their anguish they are able to then identify with their feelings of solitude (Mijuskovic 1985: 13). On stage, in their dialogue, the characters reflect and become self-aware of their sadness, and feel isolated from those who are more fortunate than them; a feeling that resonates in the audience, back then, as well as now.

Loneliness started to adapt, and develop, starting in the 1600s and continuing into the 1700s, with Locke, Descartes, Leibniz and Kant and their theories on consciousness. This idea of the relationship between loneliness and consciousness is echoed and described by Mijuskovic who states that we must “scrutinize loneliness by first investigating consciousness, by first determining what consciousness must be like in order for loneliness to be manifest within the mind” (1985: 24). In the past, some researchers, such as Bowlby, have argued that, over time, human beings have become more aware of their isolation (Killeen 1998: 763). Bowlby referred to this as “our growing proximity mechanism,” which made our ancestors more aware with each generation that there is a “growing isolation between themselves and others, and thus of their vulnerability to danger” (ibid). We see this occurring in the 1700s, during the scientific revolution brought to light the scientific method, questioning previous knowledge, developing of social contracts born out of fear, and ultimately culminating in a new understanding of acute self-awareness.

Consciousness was not a new term, in several of Aristotle’s works consciousness and self-consciousness can be identified. However, loneliness becomes more developed and spoken about more clearly in the writings of Descartes. “I think, therefore I am” Descartes famously

wrote, by which he means that he cannot doubt that he exists, because in reality, he is the one doing the doubting (Weik 2010: 489). This self-awareness of consciousness is also seen in Descartes' example of how he perceives men on the street, as they can be perceived just as easily as automatons wearing hats and coats but our intuition allows us to discern different realities; "according to Descartes, self-consciousness is immediately, directly aware of itself; it *knows* itself by an act of *intuition*" (Mijuskovic 2012: xxxi). Therefore, on the one hand, our own self-consciousness, our minds being able to have their own realms of thought and consciousness, leads us to question whether it is a man or automaton on the street, but it also leads us to the conclusion that the reality is one and not the other. This relates back to loneliness, since in the 17th century there was a strong distinction made between primary, objective qualities, and secondary, subjective qualities (Mijuskovic 1985: 34). Which then developed into a division between the knower and the known (ibid); this resulted in a situation wherein "an intensifying feeling of estrangement, which simply further determined man's sense of isolation, not only from nature, but also from other men to share their sensations or ideas together" (ibid: 34). Thus, subjects were only immediately experiencing their own thoughts and ideas.

Where Descartes see dualism, Leibniz sees a pre-established harmony. On the one hand, Descartes believed that our belief in God would lead us to the reality of the situation; in other words, despite us being aware of what we were doing or perceiving, ultimately God would have a hand in it (ibid). On the other hand, Leibniz, was critical of this idea of God intervening at all times, and instead proposed that God had created the world in such a way that every mind and object, in their own way, followed a pre-ordained path (Weik 2010: 489). Put differently: "while Descartes held that movement was a succession of points observed by someone, Leibniz emphasized the internal qualities of movement, i.e the fact that it was determined by previous

movements and future states and that it contained a dynamic principle (the energy) that caused the movement” (Weik 2010: 488). By the beginning of the 1700s, views on consciousness and self-consciousness were still rooted in mainly epistemological debates, and there lacked an actual theory of consciousness, let alone loneliness (Sturm and Wunderlich 2010: 53). Arguably, the fear of loneliness up until this time manifested itself in the form of the fear of death, or rather lack thereof. Despite there being many stories about the quest for immortality, many people in the West were comforted with the idea of God, and therefore, even in death they were not lonely since God was omnipresent: “How could one be emotionally lonely when He was always there?” (Alberti 2018: 248).

However, starting in the 18th century and continuing into the 19th century there is a significant amount of work that explores a new, primitive land in which, “solitude is inherent, but not necessarily problematized” (Alberti 2018: 245). As noted by Alberti, at this time, when works such as *Robinson Crusoe* by Daniel Defoe were being written, solitude was not seen as an issue the way it is today (ibid: 246). For example, in Defoe’s story, published in 1719, a man named Robinson Crusoe finds himself shipwrecked on an isolated tropical island on which he spends 28 years in solitude. Interestingly enough, Alberti notes that “there is not a single reference in the book to Crusoe feeling ‘lonely’ or experiencing ‘loneliness’” (2018: 245).

In Defoe’s account of Robinson Crusoe, the latter comes across an Indigenous person from the Island. However, instead of befriending the Islander, Crusoe conditions him in to being a slave and calls him Friday, the day of the week on which they met. Arguably, the significance of this encounter is best described by Hegel, who in the late 1700s wrote about the Master-Slave relationship. Hegel’s analysis is as follows:

That each of us alone is a tragedy. But when we attempt to reach the other, because no one wishes to be alone, we at once discover ourselves struggling against the other for

domination, a supremacy which demands that the other recognize our own reflexivity while entirely subordinating his self-consciousness and freedom to us. (...) paradoxically enough, we further alienate ourselves from the other in the very process of trying to secure or reach him by attempting to compel him to submit to our 'masterhood' (our self-consciousness) (Hegel cited in Koch 1997: 179).

Thus, we can conclude that loneliness, despite being present, was understood so differently.

Since as previously noted, when comparing a more modern version of the tale of the shipwrecked person, *Castaway*, the main characters respond to their isolation and loneliness in such differing ways, which makes them characters of their time. The effects of this kind of writing, and this story started to change how we thought of loneliness, isolation, and solitude. As noted by Mijuskovic:

In the discipline of literature, the enforced isolation of Robinson Crusoe signaled the coming dominant theme of subjectivism prevalent in all subsequent art. In other words, whereas Descartes achieved a revolution in philosophy through his egocentric turn, Defoe's own chronicle of the marooned mariner marked the beginning of an entire method of narration in literature which eventually reached its logical mode of expression in the "stream of consciousness" (2008: 73).

This egocentric turn and new mode of expression came in a new form in the 1800s. This was the beginning of the romantic era, wherein, romantic literature is characterized by "feeling," as Baudelaire, puts it (Honour 2018: 14). Those from the romantic era believed they were different from their predecessors, and thus many of their works were autobiographical and confessional in nature (ibid: 18).

Furthermore, in art, the romantics were "conscious [of their] opposition" and this led to their own individual styles (ibid: 19). The romantics were a time of change, enlightenment, and upheaval; the historic use of classicism was coming to an end (ibid: 20). Instead, the staples of romantic work (literature, art, music) were spontaneity, individuality, inner truth and an overall emphasis on the "artist's sensibility and emotional 'authenticity'" and "the expression of the

artist's own personal living experience" (ibid). Everyone was unique, and their art, writing, music was their way of showing it. The romantics' individual sensibility was responding to the world around them, and they valued their own unique experiences. This was different from the previous century, since, as seen in Descartes and Leibniz, the dominant worldview centered around religious perfection, and believed in a logic to the universe and to mankind; the romantics placed a new emphasis on emotions, emotional integrity, uniqueness, and an ever-changing world (ibid: 21).

The concept of loneliness and solitude begins to change starting in the 1800s. Prior to this time, the idea of solitude and a "lonely life" were thought about as being practically synonymous (Alberti 2018: 246). However, at the start of the 1800s the difference between "the physical state of being alone" and "the emotional state of loneliness" is developed (ibid). Furthermore, not only was a distinction made between the two states, but they were also "increasingly knitted together from the late 18th century as a seemingly modern concept of "loneliness came into being" (ibid). Up until the 1800s, there were many references to solitude especially, but the emotional experience of loneliness was not quite discussed:

[There was] a notable decline in the use of the term "solitude" from the mid-19th century. This decline corresponds with the increasing use of "loneliness" to refer to both a physical and a mental state. Now, because loneliness and being lonely were not cultural preoccupations prior to 1800, these terms do not appear in the medical literature around emotional or physical health (ibid).

In romantic literature, solitude was not considered a necessarily negative experience, and this began an understanding of loneliness. Romantic poets, such as Keats and Woodsworth, would describe nature in terms of its beauty, and as a retreat from the busy life of the city. Furthermore, this kind of solitude was "not incompatible with sociability, as it could be mentally and

physically invigorating, improving the individual so that he or she might better fare in society” (Alberti 2018: 246).

However, this “self-imposed ideal of solitude” was apparently more common in women, who were more likely to have solitude imposed on them rather than choosing it (ibid: 247). Women did not have the same rights as men, and thus women were only left alone for religious reasons mostly, and most literature that dealt with women and solitude suggested that they were alone due to the neglect of a lover (ibid). Thus, for women, solitude was usually imposed from the outside, and this was seen as problematic (ibid). At this time, it was known that “excessive solitude had been long linked by medical writers to mental afflictions, worry and self-doubt” (ibid). The issue of solitude and women is reflected in the writings of Susanna Moodie and Catherine Parr Traill. Immigrants from England, Moodie and Parr Traill wrote in an epistolary fashion about what is now known as Canada. Moodie’s “*Roughing it in the Bush*,” a compilation of her letters, and Parr Traill’s “*The Backwoods of Canada*” are indicative of this period in which individuals were becoming more aware of their surroundings, of their emotions, and of their experiences, and their imposed solitude. When reading these two works, it is clear that these women at first saw nature as sublime, the way the romantic poets saw it. However, as time goes on, the raw nature that surrounded them became a “green prison” where the unknown land made them weary and lonely (Farahmandian and Ehsaninia 2012: 150). The experiences of these settlers demonstrated shifting understandings of loneliness. Furthermore, their loneliness was exacerbated by their solitude, and by culture, as “sociability was crucial to learned British culture”, and thus the lack of social networks made for a lonely experience for them (Alberti 2018: 248).

The 18th century saw a distinction between oneliness and loneliness; with loneliness being written about. However, this was also a time where there was an increased need for social networks, and secularity was on the rise (ibid). The 17th and 18th centuries also saw the Enlightenment, and with that, “the privileging of reason and the rise of alternative ways of viewing the mind-body relationship” in a secular light (ibid). The development of oneself was no longer understood as one influenced by God, but rather there was:

... a philosophical and civic trend by which the perception of loneliness depended on the “self” being externally developed and sustained in relation to peer groups and communities that shared, and outwardly performed, rituals of belonging (ibid).

Therefore, as argued by Alberti, there is the beginning of an “inward turn” of individualism, that is characteristic of loneliness today, as people are more inclined to “arrange and interpret their social relationships according to their individualist values” (Swader 2019: 1307). This is the case in the 1800s when people begin to invest in social networks and work as opposed to religion. This is important since loneliness is the perceived lack of social ties (ibid: 1308). Thus this 18th century product of individualism, “provides a starting point for understanding how loneliness has subsequently been defined and articulated as a modern epidemic” (Alberti 2018: 249).

Coming into the Victorian era, the mid 1800s, novels were plagued with the need for social acceptance, and desire for a romantic partner (ibid). The characters were lonely and “in search of psychological growth and freedom” (ibid). Furthermore, the setting of these novels was the growth of the industrial revolution, which began to paint a picture of a very unforgiving society. This was captured by many writers, specifically Charles Dickens, and philosophers such as Karl Marx, who wrote about the “psychological paradox” of the 19th and 20th century industrial society where, “on the one hand, it was necessary for the working classes to operate like cogs in a machine, but on the other, that was a potentially dehumanizing process” (ibid). As

humans in a capitalist society, we are forced to work, but in this case, the work was so awful it was inhumane.

As the Industrial Revolution progresses, Marx writes about the alienation felt by humans from nature, bureaucratic and economic systems, work, and the technological means of production. He goes into detail about the objectification, estrangement and, ultimately, alienation of the worker from their labor (Stevens 2014: 77). Marx argues that, in the end, we are isolated by the actual physical machine and our own “dehumanized” labour (Mijuskovic 1985: 14). Marx argued that capitalism had resulted in a situation where, despite there being an abundance of goods, not everyone’s needs were being met, and thus men and women would have to someday soon change their consciousness in order to establish a new society; for him one of the key components of this society would be common ownership (Warminski 1995: 118). Marx used alienation as a way to describe the “human activity that lies behind the seemingly impersonal forces dominating society” and furthermore “alienation was seized upon to explain the miseries of modern life, and the ‘lonely crowd’”(Cox 1998). Marx is particularly important when considering loneliness, since the feeling of loneliness is not just being described or alluded to, but is in fact explained via a specific reason. Marx described at length the effects of materialism; how capitalism transformed not only what we value in society, but also how we work within society; and how this situation resulted in humans beings becoming alienated first from their work, then from each other, and then society altogether.

On June 13th 1949, German philosopher and theorist Hannah Arendt wrote the following to American sociologist David Riesman, which echoed Marx’s sentiment of a growing alienation being felt in the West:

What struck me in your paper is that people are not (even if they say so) satisfied with respect in their community, that they want more; they want here again the impossible,

they want the active approval, amounting to friendship, of exactly everybody, and of course, make friendship impossible because of this (cited in King 2012: 37).

Despite the fact that Arendt was criticizing American society, I argue that she is referring to loneliness despite not using the word. The unfulfilled desire for friendship is shown in her quote, as well as the want to fit into society and the community. As previously described, loneliness is the want but lack of meaningful relationships, which results in feeling socially isolated.

Loneliness began to be a focal point of culture, society, and the subject of new theories, in American society as early as the 1950s (King 2012: 38). “What is feared as failure in American society, is above all, aloneness” Riesman noted in 1953 (ibid). Riesman wrote, “The Lonely Crowd,” published in 1950, wherein he hypothesizes that “changes in population and technology everywhere are the chief correlates of changes in the social character” (Riesman 1950: v). Riesman notes what Marx had predicted: our focus turned to material things as a consequence of the Industrial Revolution. Riesman suggests that our social character has developed from inner-directed character type, to other-directed character type, as humans become more interested in aesthetics and consumption (Stivers 2004: 14). The norms of media became increasingly important (ibid). This is significant since, “the other-directed character type is a cultural form in which individual personalities develop” (ibid: 16). The Lonely Crowd became a catchphrase to describe the alienation felt by the primarily modern urban society, despite the book ending on a positive note encouraging individuality and autonomy, rather than the idea that everyone must be like everyone else.

American society’s interest with loneliness permeated in the 1950s in popular culture. For example, as pointed out by Erik Erikson, “lonesome cowboys and motherless children were standard motifs in American popular and folk cultures” (King 2012: 38). Furthermore, American society would come to be known for the country music genre, wherein “lonesomeness is part of

what makes country music so quintessentially America, though scorned by the urban and urbane” (ibid). Plays such as *Death of a Salesman* and literary works like *Moby Dick* are characterized by the loneliness felt in society, and were understood through society’s experience of loneliness: “what would *Moby Dick* have been without the presence of [...] American *isolatoes*”? (ibid: 40). Thus, as we begin to understand and acknowledge loneliness, we see the rise of it in popular culture.

As loneliness developed and became part of popular culture, the coming of a highly technological society and digital culture had a drastic effect on loneliness. Although ideas and forms of the Internet existed as far back as the early 1960s, “this networked computer system was first referred to as the Internet in 1974” and was only used for military purposes (Reed 2014: 32). The Internet expanded beyond the military in the 1990s and would become one of the most popular communication methods used globally (ibid: 1). These new forms of digital communications, coupled with the creation of new technologies such as smartphones and laptops have created lasting social effects on individuals and societies around the world. As defined by T.V Reed, digital cultures are “the social relationships that occur through the immersion in the realm of the Internet, video games, smartphones, and other high-tech platforms and devices. Studies of digital cultures ask how communication technologies reflect the wider social world, how they create new cultural relations, and how those new online experiences in turn reshape the offline world” (ibid: 2). It is important to consider this since the more we interact in these digitized ways, the more we cannot isolate the difference between the real and virtual world (ibid: 20). The effects of these communications and technologies have had a huge impact on loneliness since, on the one hand, we are able to communicate in so many ways and we are able to reach more people than ever before, but on the other hand, these same technologies have made

us lonelier than ever. Thus, I will be considering how these new technologies and ways of communicating have been used to counteract these lonely feelings, and whether or not they have been successful.

This genealogy of loneliness does not capture the full complexity of the concept at hand. Whether or not there is a distinctive understanding of loneliness for each country is debatable; for the purposes of this thesis, I believe that there are enough overlapping themes, as shown in this review, that despite differences, throughout Western history, loneliness has meant and evolved in a similar pattern. This is important because by looking at loneliness as a historical phenomenon, we can detect patterns and themes and ways in which societies attempted to deal with it; by understanding loneliness, and its roots, how it came to be present in societies at different times, we can begin to understand how to address it. Therefore, the focus of this thesis considers the effects of technology and how physically and psychologically it has impacted how we see ourselves, how we see others, how we see relationships, how we see society as well as culture, and consequently how we understand loneliness and how we need to deal with it.

Theory Review

Based on the review I have done, loneliness was at first only considered as a psychological construct, something that individuals felt by themselves. As described by Sisenwein in their 1964 study, at the time, previous notions of loneliness, all centered around the idea of “self-estrangement” (8). Sisenwein describes this idea as the issue of the “modern man in his preoccupation with popularity, conformity and status has forsaken his true inner experiences. Such circumstances, according to these authors, leave the individual feeling cut off from himself and others; they cause him to experience loneliness” (ibid). We see these changes in how one

feels about themselves and society in the previous literature review. However, Sisenwein argues that this idea of self-estrangement fails to answer the question: “does a sense of loneliness come first and then force the individual to ignore his own experiences in attempting to make contact with others? Or does one’s estrangement from his inner feelings start a process which culminates in the experience of loneliness?” (ibid). Sisenwein claims that Whitehorn at a 1958 Psychotherapist conference “came to grips with this issue” when Whitehorn viewed loneliness, as we see it today: “as a felt lack of meaningful personal relationships” (ibid: 9). Whitehorn claimed that self-estrangement comes first, and then loneliness exacerbates the situation (ibid). Whitehorn argues that this view of oneself, will then affect the relationship individuals have with others, since:

The incongruity between one’s own presumptions and expectations on one side and the responses of others on the other side may thus generate feelings of frustration, confusion and resentment – a lonely feeling of being misunderstood, unappreciated, estranged which then impedes frank self-revelation and acceptable feedback, and thus blocks the normal processes of realistic readjustment. Some substantial incongruity between the self as felt and the self as reacted to by others generates and accentuates a feeling of loneliness, and this process may become a vicious cycle of loneliness and estrangement (ibid).

Sisenwein study aimed to investigate the accuracy of Whitehorn’s hypothesis. Therefore, Sisenwein created “Loneliness Scores” which was developed out of psychological insight into how people experience loneliness, along with a large collection of statements. This was to test: the correlation between the individual’s self-view and how others viewed them, and the correlation between an individual’s self-view with the view of an individual who resides with them (Sisenwein 1964: 51). Sisenwein’ study did not support Whitehorn’s thesis, and thus there was not a substantial correlation between the Loneliness Scores. Sisenwein concludes that Whitehorn oversimplified the issue of loneliness and that ultimately “loneliness appears more

related to how a person views himself and experiences the responses of others. How others actually respond to the individual may not be of essence” (1964: 55).

Sisenwein’s study is important since it was one of first to create a loneliness scale, and was testing to further research in the topic. Due to studies such as Sisenwein, Dan Russell et al created their own study, also in pursuit of creating a Loneliness Scale. Despite Russell et al crediting Sisenwein’s work, they argue that ultimately Sisenwein lacked “adequate external validity” as the study only relied on a single self-report questionnaire, which can be influenced by social desirability by participants (1978: 290). With this in mind, Russell et al condensed strengths from previous loneliness studies such as Sisenwein’s to create a comprehensive 20-point Loneliness Scale. Their understanding of loneliness was also rooted in psychology, as it linked loneliness to “emotional states such as depression, anxiety, or feelings of boredom and emptiness” (1978: 293). Therefore, Russell et al argue that their Scale will promote the mental health problem that is loneliness, and to promote research that considers the causes and treatment for loneliness (ibid). Whether or not the Loneliness Scale did that is debatable, however, what is not is its popularity. Despite Russell et al publishing more recent versions, it is called the UCLA Loneliness Scale, and it is one of the most widely accepted scales for testing loneliness, which is important when considering theory.

I argue that despite loneliness having its roots in psychology, that now more than ever, sociological constructs are coming to the forefront in how we understand and deal with loneliness; since at its core, loneliness deals with relationships, and perceived lack thereof. The UCLA Loneliness Scale specifically considers individuals, but it does not take in to account other third parties that could be affecting loneliness. Consider Japan, they have a more extensive vocabulary when it comes to describing loneliness; for example, *hikikomori* refers to people

“who shut themselves in their homes” (Blackpool et al 2018). Furthermore, a recent study conducted using the UCLA Loneliness Scale, indicated that 9% of adults feel lonely in Japan in comparison to 22 and 23% in America and Britain (ibid).

The reasons we feel lonely are debatable, which is why I will be considering various theories that consider the causes of loneliness with a more sociological perspective. I think that Sisenwein, Whitehorn, and Russell et al are right in the sense of how loneliness is felt, but I think we need to consider why with a wider scope beyond lack of personal relationships and mental health. Similar to Whitehorn, I think by considering other theories we can understand what exacerbates loneliness.

The theories I will be covering will consider more specifically the effects of: gender, the life cycle, cognitive skills, personal relationships, attachments, culture and the effects they have on loneliness. The first part will focus on the effects of culture, specifically considering how the effects of one’s culture influence how we experience loneliness. The second part will focus on the life cycle; so how the experience of loneliness changes based on your age, as well as gender. The third part will consider how social and cognitive skills have an effect on the experience of loneliness. The fourth part deals with attachment theory, and how this explains how technology is being brought in to theories of loneliness. Lastly, Actor-Network-Theory will be used to discuss the overall patterns we are seeing in loneliness and the coming of anthropomorphic technologies.

Cultural Approach to Loneliness

There are several cultural theories in terms of loneliness. As argued by Ami Rokach, and echoed in Hannah Arendt, most research on loneliness has focused on North America, however,

loneliness is apparent in all cultures across the world. Despite loneliness theories and the concept of loneliness focusing primarily on individual factors, and experiences Rokach claims that:

If we accept the premise that loneliness is expressive of the individual's relationship to the community, then it is conceivable that the difference amongst cultures and the ways people's social relations are organized within them will result in cross-cultural variations in the way people perceive, experience, and cope with loneliness (1988: 75-76)

For example, living alone has seen unprecedented growth since the 1960s (Snell 2017: 8). Prior to the 1960s, a rather general conclusion can be made that in most countries in the West, only 10% of people lived in single person households, or what Snell calls "solitaries [which] are households of one person, whether widowed, single, or of unknown marital status" (2017: 7). In 2011, 24% of American household are solitaries; however, there are places such as Midtown Manhattan, and Downtown Los Angeles, where in 2011 and 2012 respectively the percentage of solitaries was at a staggering 94% (Snell 2017: 12). This means that practically everyone in these large areas lives by themselves. It is important to note that Japan stands out, since as early as 1771, Japan had an average of 17% of solitary households (Snell 2017: 24). That was unprecedented at that time. This trend in Japan suggests the differences in loneliness and in respect to cultural understandings and experiences of it. Scholars have argued that Japan has "an interdependent social organization [that] functions to meet social needs, to lessen the likelihood of loneliness" (Schumaker et al 1993: 66). In their study, Schumaker et al found that their Japanese subjects experience and displayed loneliness differently. For example, Westerners tend to score higher on emotional loneliness, more so than their Japanese counterparts (ibid: 70). Furthermore, this study used the UCLA Loneliness Scale which as I previously mentioned may or may not influence the results, as the scale does not incorporate cultural differences. For example, in Japan "patterns of communication and interaction might partially impede intimate self-disclosing social relationships. If the Japanese see such patterns as normal, they may have

little or no negative emotional effect” (ibid). Thus we see the effects one’s culture has on their experience and understanding of loneliness. As argued by Schumaker et al, the lack of cross-cultural research when considering loneliness is an issue since “cultural comparisons could offer new insights into the social factors that contribute to feelings of loneliness and to perceived dissatisfaction with life” (1993: 66). The extent to which some conditions of loneliness, like those in the UCLA Loneliness Scale, may affect the assessment of loneliness could vary based on culture (ibid).

On the one hand, there are differences in how cultures shape the understanding and experiences of loneliness. On the other hand, there is the concept of cultural loneliness. Researchers such as Rokach, van Staden and Coetzee, view cultural loneliness as the feelings individuals experience when they are in a foreign culture:

In a foreign culture, one may feel lonely in not being understood empathetically concerning one’s culturally determined views and feelings. Moreover, one may feel lonely in not being able to reciprocate empathetic understanding of the foreign cultural views and feelings (van Staden and Coetzee 2010: 526).

Thus, the two main indicators when theorizing of cultural loneliness are: the lack of one’s own preferred cultural and linguistic environment, making it hard to contact those with a similar “world view”; and the lack of identifying on the basis on one’s culture (empathy) (Sawir et al cited in van Staden and Coetzee 2010: 526). Therefore, this understanding of loneliness is present with people such as migrants or students who are away on exchange, or people experiencing what it is like to be “homesick”. I think that this idea of cultural loneliness demonstrates the importance of one’s culture, and that our culture can have an effect on how we feel mentally, and this how we experience loneliness.

This differs from what van Staden and Coetzee refer to as a culture of loneliness; wherein they distinguish the difference between individualist cultures and communal cultures, and the

difference concerns the “degree to which individuals are integrated into groups” (2010: 527).

They argue that in communal cultures, such as some African and Asian ones, individuals live in communal settings and thus the basic unit of living is the group (ibid). These cultures either live with or close to extended family and other group members. Individualist cultures, mostly Western, are described as cultures in which:

Emotional detachment and individual autonomy are valued more, whereby people who live alone, with merely a spouse or only in small families, and predominantly individual goals are pursued (...) such culture, it is said, adheres to alienating values such as emphasis on individual achievement, competitiveness, independence, and impersonal social relations (ibid).

Thus the difference in culture then leads to a difference in the nature of loneliness (ibid). For example, despite the physical closeness and group mentality, a person in a communal culture may feel lonely when they have different religious thoughts from their group; however, despite having perhaps more space in being able choose their religion, those from individualist cultures experience a loneliness in terms of personal separateness which others do not always share since the culture encourages individuals to live in a lonely way (ibid).

The Life Cycle Approach to Loneliness

As described by Yang and Victor, “the common stereotype is of loneliness being perceived as an experience almost exclusively confined to older people” and that loneliness is a common and normal progression throughout the ageing process (2011: 1370). It is seen that loneliness increases as a result of divorce, marital conflict, retirement, children leaving the house, declining health, and widowhood, all of which are attributes associated with higher levels of loneliness; “any of these events may signal the deterioration of physical capacity and health, resulting in a contraction of opportunities for social engagement and social activity” (ibid). As

indicated by Yang and Victor, if this was the case, then we would see an upward trend when considering the correlation between age and loneliness (ibid); however, this is not always the case. In fact, a 2010 publication by the Mental Health Foundation found that there was no correlation at all between age and loneliness (ibid). Furthermore, Yang and Victor concluded that in terms of loneliness, in European countries, there was a higher correlation between loneliness based on where you were from, rather than how old you are (2011: 1380). However, other studies on loneliness consider a life cycle loneliness theory; wherein loneliness is “experienced differently throughout the life cycle” and thus it fluctuates (Rokach 2000: 635). In Rokach’s research, which was based in Canada, she considered four different age groups, youth (13-18), young adults (19-30), adults (31-59), and seniors (60-80), and their experiences of loneliness. Rokach found that all age groups experienced loneliness, but that their experiences differed (ibid). For example, young adults had the highest level of emotional distress when experiencing loneliness, whereas seniors had the lowest (ibid). These differences in experiencing loneliness is arguably a result of what is generally happening to individuals in those age groups. In other words, what individuals go through at certain times in their life, influences when they tend to feel lonely.

As a result of her study, Rokach discovered that:

Present results indicate that with the exception of growth and development, young adults appear to experience most keenly and painfully the various facets of loneliness. It is interesting to note that only in the young adult group were significant differences found between men and women, with women scoring consistently lower than men on all subscales (2000: 638).

Rokach attributes these results as a reflection of North American values, that despite the gendered notion that women are more sensitive than men, they are also more likely to actively search out ways to ease the pain they feel as a result of loneliness; she infers that “young adult

women, in particular, experience less pain by openly expressing their emotional distress and attracting social support” (ibid). As well, it is argued that men feel more cultural strain to fulfill economic goals and this, coupled with their silence, results in a more painful loneliness (ibid: 639). Furthermore, it was noted that women’s loneliness did not fluctuate throughout their life cycles as much as it did for the men in the study (ibid). To add to this, a report by Statistics Canada in 2009 concluded that suicide rates for males were three times higher than the rate for females, with the highest rate for males aged 30-59 (n.p). This is significant since, there are common gender misconceptions that women feel loneliness more so than men, and that loneliness is the most common in the senior population. However, based on these statistics that is not the case.

Social Skills and Loneliness

As outlined in Taniguchi, some scholars have considered the effects of social skills on loneliness; some argue that a “deficit in social skills is the cause of people’s loneliness,” whereas others have said that “lonely people outperform non-lonely people on tasks requiring social monitoring and decoding skills” (Taniguchi 2018: 395). It has also been argued that despite having no issue with their social skills, social anxiety is what has prohibited lonely people from “successful social interactions” (ibid). In their study, Taniguchi states that:

Loneliness may not necessarily originate from a social skills deficit per se but, rather, from broader mindset that leads individuals to feel anxious during social interactions. This study proposes that such a mindset contributing to lonely individuals’ maladaptive cognitions and behaviours is an entity theory of social interactions. An entity theory is the belief that personal attributes are fixed and unchangeable, thus driving individuals to avoid negative evaluations when withdrawing from challenging situations (ibid).

This echoes what was said in Sisenwein's study, that loneliness was exacerbated by how one thought others viewed them. As well, Sisenwein pointed out that in other studies, like P.D Eddy's which was also used when creating the UCLA Loneliness Scale, loneliness was viewed as a personality trait, which is how it is described here (1964: 46). Sisenwein concluded that there was no correlation between one's loneliness, and how they perceive others see them. Since entity theory implies loneliness is a personal attribute that affects how one socializes, it in some ways is echoing previous studies that have already been dispelled. Furthermore, as previously mentioned, one can be anti-social and still not feel loneliness.

Attachment Theory

In their article, Wenteng Feng, considers the idea of people becoming shallow, and the apparent lack of intimacy in relationships that goes along with that. Attachment Theory which comes from psychology and was coined by John Bowlby, is the idea that attachments between people are important for development (Holmes 2012: 67). Although Bowlby focused on the attachment between mother and child, attachment "is an overall term which refers to the state and quality of an individual's attachment (...) To feel attached is to feel safe and secure. By contrast, an insecurely attached person may have a mixture of feelings towards their attachment figure: intense love and dependency, fear of rejection, irritability and vigilance" (ibid). Bowlby thought that attachment theory could help explain the different interpersonal relationships that people formed.

Feng, like Bowlby, is also interested in interpersonal relationships; however, Feng views them in light of loneliness and the effects of the lack of these relationships. Similar to Marx, who

was wary of the changes in capitalist society and a budding focus on materialism, Feng describes loneliness in terms of attachment theory:

Building a relationship with a material possession is one adaption method used by individuals to overcome loneliness. Based on attachment theory, failed interpersonal intimacy motivates people to seek material possessions as the focus of secondary attachments. Therefore, lonely individuals increasingly build connections with their material possessions to remedy interpersonal relationship deficiencies (2016: 1650).

Feng specifically argues that in terms of material possessions, that are to become the focus of attachments, are products with anthropomorphic qualities; which are products or objects with human-like traits. In their study, for example, Feng specifically considered the reaction participants had of an animated car which had 3 different versions, one more “human-like” than the other. Feng, citing Epley, Akalis, Waytz, and Cacioppo, “found that people who lack social connections feel the need to compensate by creating a sense of human connection with nonhuman agents” (2016: 1650). Therefore, those who consume these material possessions that are becoming more anthropomorphic, are blurring the distinction between human and non-human agents as these consumers are at times using these “material possessions as substitutes for interpersonal relationships” (2016: 1650). Lonely people are especially susceptible to this, since anthropomorphic products have the ability, in some cases, to satisfy the “belongingness need of lonely people” (ibid). In their conclusion, Feng found that lonely people preferred high anthropomorphism in hedonic products, as these “products elicit feelings of pleasure, that make lonely people seek belongingness” (ibid: 1657). As well, Feng found that when it comes to utilitarian products, lonely people did not want anthropomorphic products. Despite the fact that Feng’s study was done to investigate how to appeal to lonely consumers; it shows that there is reason to believe that lonely people can search elsewhere other than people, to create attachments.

Actor-Network-Theory

In 1995, Robert Putnam published an essay titled “Bowling Alone: America’s Declining Social Capital.” In this essay, Putnam puts forth evidence that indicates a decline of civic engagement and social capital and shows how this has affected society. Putnam argues:

Developed societies are becoming increasingly aware of the apparent fracturing of an implicit social contract among their citizens. The quality of lives and the capacities of institutions are deeply affected by declining civic engagement and eroding bonds of social trust, family, and neighbourliness (1995: 1).

Putnam focuses on the role of the government and policy to increase social capital. However, what is of particular importance here is that, when describing the “erosion” of social capital, Putnam remarks that technological advances, especially the television, and the “privatizing or individualizing effects of communication and transportation technologies” have made at the same time communities, wider, as well as inclusive, but also “shallowers” (1995: 2). Putnam was able to see the influence that new technologies like the Internet and smartphones would have on our social networks, which allow for us to be more social, but in some ways, not develop meaningful connections. He argues we must examine the impact that technology, communicative technology, and electronic networks are having on social capital (ibid). This is significant when considering loneliness since as predicted by Putnam, technology has had a significant impact on loneliness.

Actor-Network-Theory can be used to describe these new social relationships and attachments, as it aims to describe, as opposed to explaining, social relations. In their book, *Reassembling the Social*, Bruno Latour writes about the Actor-Network-Theory (ANT), an approach to social theory which came about due to “the need for a new social theory adjusted to science and technology studies” (2005: 10). Although within ANT there are different definitions

of the non-human, Latour argues that “one of the precise roles granted to non-humans (...) [is that] they have to be actors and not simply the hapless bearers of symbolic projection” (ibid). Thus, we should see the artificial person as social as implied by ANT as it rejects the subject-object dichotomy, and its passivity (Jones 2017: 557). The issues that arise out of non-humans being given social agency will be further discussed in the discussion section of this thesis. The introduction of ANT is to demonstrate that human and non-human qualities are becoming entangled in complex shifting networks and relationships. One can no longer exist without the other. The following case study section shows how these social realities are being played out. This is an unprecedented occurrence and our current categories of what it means to be human or being social, do not fully acknowledge the transformations taking place.

My Theory

There is less of a debate on how loneliness feels, and more about what causes it. Therefore, I think culture plays a role in the causes of loneliness and subsequently how one experiences it. When considering Japan, it is clear that their culture has a different way of dealing with loneliness, and despite the feeling being present it is not problematized or feared the same way as other countries. Therefore, I theorize that the most applicable theory for understanding loneliness is one that includes culture; specifically, how culture has influenced the attachments we have made. This is significant since as seen in ANT we should be incorporating dialogue that takes into consideration the new attachments that are being created as technology and products are becoming more anthropomorphic.

Chapter 4: The Genealogy of the Non-Human and Anthropomorphic Technologies

The next section lays the foundation for the idea of the non-human, and the development of anthropomorphic technologies throughout time in the West. I specifically considered the genealogy of our interactions with non-human objects and technologies, that have anthropomorphic qualities. What begins as a more physical approach at first, with the evolution of the robot, the section concludes with technologies beyond the robot, and considers artificial intelligence and virtual reality, as they simulate cognitive development, as well as the combination of both physical and mental technologies. The genealogy aims to deduce the nature of human relationships with these technologies, in order to predict how humans would interact with these technologies as they develop presently.

On display on the first floor of the Herakleidon Museum Annex in Central Athens, Greece, you will find what is, for all intents and purposes, an automated maid. This is, more than likely, the first robot known to humanity and was invented during the Hellenistic Period in about the 3rd century B.C (Herakleidon Museum 2019). This complex device, in the form of a woman, held a jug of wine in her right hand. Suspended in her chest were two jugs: one for wine and one for water (ibid). If a cup was placed in her left hand, she automatically poured in wine first and then just the right amount of water. This futuristic maid was created by Philon of Byzantium, an ancient hero, and scholar of Alexandria born around 280 B.C. He also developed “an impressive list of machines and plans for self-moving devices in the forms of human and animals,” which were “greatly admired in antiquity and the Middle Ages and are still studied today” (Mayor 2018: 199). Even earlier than this, “the first automaton described in the ancient literature” dates back to 1300B.C., from the state of Memnon, and belonged to the king of

Ethiopia (Iavazzo et al 2014: 248). Created by Amenhotep, the statue referenced could play music, which was activated by the rising of the sun (ibid).

Furthermore, in ancient literature, specifically in Greek mythology like Homer's *Iliad*, we find evidence of "self-moving tripods and golden handmaids," which are examples of the automata (Kakoudaki 2014: 15); the automata, is a machine that, when told, performs human-like tasks. Furthermore, there is the automaton, similar to the automata, found in the tale of Talos, "the mythical man who guarded the island of Crete, present him as a man made of bronze and constructed by Hephaistos" (ibid). Talos was first created to help Hephaistos walk, but then was used to guard Crete; despite his mostly mechanical body, enclosed in his body was a single artery and a membrane, which made it possible to kill him (Iavazzo et al 2014: 250). Therefore, throughout ancient history and mythology, we see the development of the use of non-humans, and their uses which are similar to today: manufacturing, machining processes, helping those with disabilities, transportation, managing objects, decision making and following orders by searching through databases of rules (ibid).

Kakoudaki believed that the earliest origin stories of human civilization discuss the artificial human. For Kakoudaki, the Creation stories and mythology are examples of a fantasy of animation, "whereby a divine presence or god creates people by animating inanimate matter" (2014: 4). The Far East holds another example of human interest in robots dating back to the Qin dynasty (221 – 206 B.C.), wherein evidence exists to show that artisans from those times developed mechanized puppets and other devices (Mayor 2018: 201). Furthermore, Aristotle argued that "animate beings carry the ability for motion in themselves, while inanimate beings must be moved from the outside by another agent" (Kakoudaki 2014: 18). And so mostly, up

until the Renaissance, most dialogue around the artificial human was centered around a divine presence or magical intervention (Kakoudaki 2014: 5):

In ancient contexts, a divine presence breathes life into inanimate materials such as wood, clay, or stone, and this miracle proves the existence of the divine figure and explains the emergence of life. Modern depictions of animation revolve around technological animating agents and spectacular bodies (ibid).

Therefore, the idea of the non-human having anthropomorphic qualities has existed for centuries. Although the ancient relationships were more theological and spiritual, before becoming more material and practical, our interest in creating the perfect person, or rather, just creating a person dates back to Greek mythology. In his book, *Politics*, Aristotle, translated by Iavazzo et al, says: “if every instrument could work alone when ordered, if the shuttle of loom could weave itself, if the bow could be initiated only upon the lyre, the entrepreneurs would not have the need of neither masters nor slaves” (2014: 251). In 300 B.C, there are predictions of what was to come of this technology, and it is more in tune with how we are using these technologies today - in production.

In the 13th century, a Jewish folktale became popular, the *Story of Golem*, which is about an anthropomorphic being, Golem. Although there are earlier conceptions of this story going back to the first century, the story remains essentially the same: a Rabbi sculpts Golem out of clay, and then magically, through rituals, brings him to life (Yair and Soyer 2008: 325). The main use of Golem is to protect the Jewish ghetto (ibid). Despite Golem keeping the community safe, he “harbored uncontrollable and dangerous potential” and thus he could not always be “kept alive” for fear of what he may do (ibid). This is similar to what we are seeing in popular culture today, with many movies and television shows that center around the idea that we must fear what the non-human is capable of.

In the 15th century, Leonardo Da Vinci wrote the *Codex*, which contains highly detailed anatomical drawings of the human form (Isaacson et al 2017: 190). This study led Da Vinci to build a robot designed and proportioned based on the idealized male proportions given in the Roman ‘father of architecture’ Vitruvius’ *de Architectura*. This robot could sit up, wave its arms, move its head and had a flexible neck with an anatomically correct jaw (Iavazzo et al 2014: 254). The robot was dressed in a typical suit of armor following the German/Italian tradition. All of the main body joints – ankles, knees, hips, shoulders, elbows and wrists – were moveable. Its chest contained a controller and the legs were operated by a pulley system. I see this as the development of the non-human taking on more anthropomorphic qualities. This is significant since it is an object that not only appears in human form, but also appears to be performing human tasks. The Turk Chess Player and the Digesting Duck, which will be discussed below, are more examples of this development towards more anthropomorphic technologies.

In the mid-1700s, Wolfgang von Kempelen created an automaton called “the Turk or the Chess Player,” which could play chess against a human opponent, to impress Empress Maria Theresa of Austria (Iavazzo et al 2014: 254). This humanoid is not just performing a task, but is interacting with a human and has cognitive skills. However, this was still the 1700s, and there was, in fact, a human beneath the surface (Hyman 2011: 6). In other words, “what is striking about this is that *the* distinguishing condition of the automaton – its characteristic of being self-generating – need only be apparent rather than actual” (ibid). This is important in terms of the definition of automaton, which even today applies to “a piece of a mechanism having its motive power so concealed that it appears to move spontaneously” (ibid: 5).

Also in the 1700s, Jacques de Vaucanson created his Digesting Duck. Similar to the chess player, the duck appeared to have the ability to eat, metabolize, and defecate (Richardson 2016:

118). However, a closer look inside would prove that there were two containers inside the duck, one of food and one of feces, which created the illusion that the duck was actually intrinsically alive, the same way the Turk appeared to be “alive” by being able to “think”. Despite the creators of these devices making fraudulent claims about how they were accomplishing the tasks they were doing, they sparked debate at the time about the “extent to which machines could emulate or replicate human faculties” (Standage cited in Richardson 2016: 119). Thus, in 1751, in Diderot and d’Alembert’s *Encyclopedie*:

The automata gave rise to the term *androïde*, defined as “an automation in human form, which by the means of well-positioned springs, etc. performs certain functions which externally resemble that of man” (ibid).

We can see there the development of anthropomorphic technologies and the deliberate ways in which they are constructed to appear human.

In 1818, Mary Shelley published *Frankenstein*. This is “the best-known story about a constructed or artificial person in modern literature” (Kakoudaki 2014: 29). In the novel, a “creature” is formed with both human parts, as well as non-human agents, in the form of a man. Victor, the character who creates Frankenstein, says “With an anxiety that almost amounted to agony, I collected the instruments of life around me, that I might infuse a spark of being into a lifeless thing that lay at my feet” (ibid). Shelley’s account of the “artificial birth” is important since it not only does the technology in this case appear human, but it is becoming human. This is significant since when producing sex robots, the process is similar to that of Frankenstein: covering technology with skin that resembles that of humans so much you would not know the difference.

In the 20th century, the word “robot” was used for the first time. Czech writer, Karel Capek, wrote the play “Rossum’s Universal Robots,” which was performed for the first time in Prague in 1921 (Iavazzo et al 2014: 254):

Robots are presented in this play as small artificial anthropomorphic creatures which obey strictly the commands of their master, but eventually rebelled against their creators. These creatures are called “robotnik” in the Czech and Russian language from the word “robota”, which means “forced labour” (ibid).

The play is set in a factory where the robots are created, and a scientific laboratory where the formula for the robots is made (Richardson 2016: 114). Much like Marx’s prediction, Rossum (Capek’s character) created these robots in the play to take over the jobs of the alienated worker. It has been argued that because of the derivative of the word robot, subsequently it has linked “robots forever to servitude, enslavement, and revolt” (Kakoudaki 2014: 9). The setting of the place makes for “a darkly futuristic vision of modernity,” in which the robots destroy humanity (Richardson 2016: 114). Despite this being the theme for many future works focused on robots, when put in context, this play came out around the time that WW1 and the Russian Revolution ended, and so the general view on humanity and its future was bleak (ibid). Furthermore, as Richardson puts it, the play is also:

... a commentary on humanity and the capacity to (re)animate it in alternative ways, since his robots are made with human body parts, echoing themes occurring in a plethora of Euro-American and Judeo-Christian religious and literary texts, from the Jewish myth of the Golem to Mary Shelley’s *Frankenstein* (ibid).

A common theme in these stories is the fear and destruction that could be caused by anthropomorphic technologies. In 1919, Sigmund Freud, wrote his essay *The Uncanny*, in which he states: “the uncanny is that class of the terrifying which leads back to something long known to us, once very familiar” (1). As described by Richardson, the uncanny can be a result of several situations or objects such as: “the unhomely,” the “double,” or anything that provokes

“intellectual uncertainty,” or difficulty in judging “whether something is animate or inanimate,” or “the confusion when something not alive ‘bears an excessive likeness to the living’” (Richardson 2016: 118). All of these are situations could involve humanoids or robots. Humanoids refer to robots that resemble humans, whereas robots can take many different forms. Therefore, these kinds of objects historically, and, as I argue, presently destabilize “the boundaries between human and machine, living and dead, animate and inanimate” (ibid).

In 1939, New York’s World Fair showcased Elektro – “a robotic man created by Westinghouse engineers that answered audience questions and performed, or pretended to perform, the advertised role of the robot of the future, a helper for household chores” (Kakoudaki 2014: 9). Elektro was so popular, Westinghouse would later add a robotic pet dog, Sparko: “a modern pet for a modern family” (ibid). Elektro and Sparko stand in contrast to the robots in Capek’s play, as they are not threatening to humans and promote a positive relationship with technology (ibid). Not only does Elektro provide a utilitarian purpose, but arguably people liked it enough that Sparko, who has no utilitarian purpose was created. Sparko’s use is solely social, and this is a development in our interactions with non-human anthropomorphic technologies. In the 1940s, Isaac Asimov began to write stories about robots as well as sci-fi characters: the first had robots that were so humanlike, they were indistinguishable from humans, with even one story including a robot being elected as the mayor of New York City (Kakoudaki 2014: 10). In Asimov’s story, these robots were gentle at first, but then eventually took over the world “through a vast network of computer-controlled automated factories” (ibid). In his stories, Asimov takes note of the technological advances happening during the time, such as: feedback and control systems, communications, information, and computer technologies (ibid). Furthermore, post-WWII, the human-machine or human-robot interaction emerges as a key

research focus (ibid). This was also known as “cybernetics,” a term which Norbert Wiener coined in the late 1940s, after the Greek word for governor “kubernētēs” (ibid: 11). As a result of the growing interaction between humans and non-humans, Asimov developed three laws of robots which were a theme throughout his work and are:

A robot must not injure a human being or allow the injury of a human being due to inactivity. A robot must obey the orders which are given by human beings except for those that conflict with the First Law. A robot must protect its existence unless such protection conflicts with the First or Second Law (Iavazzo et al 2014: 255).

The idea that robots to some degree even have “laws” presents the question of personhood, or even citizenship, since historically only those considered to be persons, as opposed to property, are granted rights under the law. The growing interaction between humans and non-humans was prominent enough that boundaries needed to be created.

In the 1950s, the name George Devol became synonymous with the invention of the robot. Devol devised the first programmable robotic arm, patented in 1961 (Dassbach 1986: 54). The same year the “Unimate” was introduced by Devol, and it was an automotive assembly line that led to an industry standard for industrial robots, and paved the way for an industrial robotics revolution, and is still one of the largest producers of industrial robots today (ibid). From a two-dimensional drawing to an industrial and societal revolution, the Unimate robot remains one of the most significant contributions in the past one hundred years to manufacturing. As a result of the Unimate, the field of robotics continued to expand beyond manufacturing to virtually every facet of human life and service. At first, this kind of technology was prominent in the auto industry. While approximately 8500 Unimates were sold and became a popular feature of motor vehicle assembly lines, other significant early contributions to robotics were sponsored by the fields of space technology and medicine for microsurgery. Even in the 1970s, NASA’s Viking mission to Mars included robotic arms that were made of “two light ribbon-like extenders rolled

into a drum. The two halves unfurled and connected, creating a tube to scoop samples from the planet's surface" all the while being guided by operators on Earth (Nocks 2001). By the second half of the 20th century, non-humans with anthropomorphic qualities, were not only becoming realities, but being used more and more, interacting with humans on all new levels, and permeating all different sectors.

In 1965, Ivan Sutherland published a paper about the creation of an "immersive 3D graphic display" (Shields 2004: 55). This can be considered the beginning of what we now call "virtual reality". Sutherland's work inspired the creation of "a 3D head-mounted display helmet, [wherein] the objective was to link more closely the user's mind and computer" (ibid). The introduction of VR created a whole new realm of how humans interact with non-humans in a virtual world, that simulates a real one. VR is defined by Rob Shields as, "a computer-generated simulation or presentation of an environment in which the user experience a sense of phenomenological presence or immersion in the environment" (2003: 54). The reality and use of VR is, "a metaphysical site for extending or exploding the limits of the embodied self" (Kakoudaki 2014: 8). VR really took off in the 1990s when companies such as Nintendo, Sony and Microsoft started manufacturing and selling VR technologies such as gloves, goggles, and controllers that could react (ex. vibrate) to what was happening in the virtual world (Shields 2004: 58). The effects of VR depend on the "immersion" we feel, therefore the more real it seems, the more immersed we are (Reed 2014: 20). The issue with this is that we never actually leave the real world, and so the more people used and immerse themselves in VR it becomes less of a virtual world (ibid). As explained by Shields, VR simulations "usually start out as reproducing actual worlds, real bodies, and situations; but like simulations, they end up taking a life of their own" (2004: 4). This "immersion" experience is also felt with people who are part of

online worlds, and who communicate in cyberspace (Reed 2014: 20). Reed argues that the experience of immersion is not a new one, that we have done it throughout history when we recount stories or read books; however, instead of our imagination filling in the gaps, these alternate worlds are being “digitally simulated” (2014: 21). These new experiences, with these new technologies influence how we see the world and how we see ourselves, especially when users have a harder time distinguishing what is real and what is virtual.

One of the main technologies that have made non-humans, very human-like, is Artificial Intelligence (AI). AI gives the ability of technology, such as robots or computers to appear to have human intelligence and cognitive abilities (Galloway and Swiatek 2018: 735). AI is allowing for technologies to operate for a period of time “without human intervention, making their own decisions and acting independently” (ibid: 738). This has contributed greatly to the development of anthropomorphic technologies, as there is it appears as though there is no medium between the human and the non-human.

New ways of knowing have in the past (like the printing press) not brought an end to the world, but they did bring an end to certain ways of knowing, while adding new ways of thinking, and new identities. And that is surely happening now; we are experiencing a (digital) revolution in how we come to know the world and ourselves (Reed 2014: 5).

The Cyborg: The Future of the Genealogy?

In the 1960s, the word “cyborg” was coined by Manfred E. Clynes and Nathan S. Kline, which “characterizes the increasing entanglement of many humans with digital devices” (Reed 2014: 219). The concept of the cyborg, of existing beyond that of a human state, brings to focus the idea of the posthuman. As technologies continue to develop, so does the interactions between humans and non-humans, which evokes the question of what is human. Posthumanists focus less on the idea of the human, and instead highlight the limits of humanness (ibid: 69). In 1985,

feminist techno-science scholar, Donna Haraway wrote, *A Manifesto for Cyborgs: Science, Technology, and Socialist Feminism in the 1980s*. Haraway, “recognize[s] that the cyborg was the ‘illegitimate offspring of militarism and corporate capitalism’” (Reed 2014: 219); but that there is a “positive potential in thinking about the metaphor of the cyborg as a figure that could break down one of the rigid boundaries that has defined putative human nature” (ibid). Haraway, and other posthumanists posit that the cyborg could bring to fruition a new genderless base for identity that goes beyond the limits of the human and non-human. The cyborg should be its own entity, and not limited to typical human categories such as gender or sexuality. The reason for this is to transcend this idea that non-humans are constrained to being non-humans; in other words, we need to reconsider how we view the non-human, as it becomes more entangled in our every-day life, both materially and virtually. Instead of trying to make it more human-like, these advanced technologies should be seen as autonomous entities, that go beyond the distinction of human and non-human. By applying this kind of thinking to Cyborgs, it could radically change how we regard each other.

The past section outlined the genealogy of the non-human, with specific consideration to anthropomorphic technologies. As we will see in the case studies, our use of these technologies continues to change as the technology changes; this will have an effect on our social networks which directly correlates to loneliness.

Chapter 5: Case Studies

As shown in the genealogy section, technology has developed in such a way that it is possessing more human traits than ever before. The objective of many technological manufacturers has been to create products that resemble humans. The following case studies will demonstrate this progression. Furthermore, the case studies will highlight how anthropomorphic technologies have a major influence on our social world, and that different cultures are receptive to different uses of these technologies. The case studies will also consider whether or not these kinds of technologies can fix loneliness, since as seen in the genealogy section, one of the main causes of loneliness is the need for human connection, that is not being met.

I will specifically be considering different kinds of social robots, as their job goes beyond utilitarian needs. They are created to appear real, which influences how humans interact with them. I will also be looking beyond the robot; and by considering dating sims, which uses artificial intelligence and algorithms to create a virtual world where many human and non-humans create social networks. The last category is the anthropomorphic technologies that possess the recombination of both physical and mental anthropomorphic technologies. The best example of which is the use of VR and haptic technologies, which make virtual simulations appear as real as possible.

Social Robots

Animal Robots: The Case of PARO

One of the most commonly known robots is a seal called PARO. This therapeutic animal robot has been used in several old-age homes, in order to ameliorate the increased need for socio-emotional support in older adults (McGlynn et al 2017: 33). PARO was deliberately created to be a seal, rather than a dog or cat since people tend to have expectations about how

common domestic pets act (McGlynn et al 2017: 34). Although participants were still interacting with PARO, with some even calling PARO a “sounding board,” PARO not talking ensures that “users’ expectations do not get inflated beyond the robots’ actual capability” (Paepcke and Takayama cited in McGlynn et al 2017: 44). PARO has realistic qualities, such as the ability to move. PARO is covered in fur, masking the robotics, which is designed to further promote engagement and attachment (McGlynn et al 2017: 24). PARO was designed for “long-term usage, and its function is solely to elicit positive emotions such as happiness and relaxation” (Shibata et al cited in McGlynn et al 2017: 34). PARO has many technologies that make it as realistic as possible, as described by the PARO website:

PARO has five kinds of sensors: tactile, light, audition, temperature, and posture sensors, with which it can perceive people and its environment. With the light sensor PARO can recognize light and dark. He feels being stroked and beaten by tactile sensor, or being held by the posture sensor. PARO can also recognize the direction of voice and words such as its name, greetings, and praise with its audio sensor (2014).

These sensors, allow for humans to interact with PARO. PARO was placed in an adult home, where he had a positive impact on people’s moods after their interaction (McGlynn et al 2017: 34). One study used an EEG technique (monitors the electrical activity in the brain) and concluded that “interacting with PARO improved cortical neuronal activity in certain individuals such that post-interaction activity indicated less impairment than pre-interaction” (Wada et al cited in McGlynn et al 2017: 34). In McGlynn et al’s study, it was found that PARO’s popularity stemmed from its appearance; for many participants, the animal’s realistic appearance, fur, eyes, and face, is what attracted them, and thus led to them enjoying their interaction with PARO (McGlynn et al 2017: 43). McGlynn et al concluded that “for robots designed for social interaction, special attention should be given to appearance” (ibid). The reason for this can be generalized to robots in general, since a robot’s appearance affects how its users and humans

alike judge the abilities of the robot, and this will then influence how it is used (Wu et al 2012: 121).

McGlynn et al's study noted that many participants enjoyed their interactions with PARO, and even thought PARO could benefit other populations such as children and lonely adults (2017: 44). However, when questioned about their own future use participants were more negative; they did not want to identify as "potential users" (ibid). Despite enjoying PARO's company, the apparent implication that "other users" of PARO were children and lonely adults, was enough for people to not want to identify as someone that would use PARO. McGlynn et al refer to this as "activating a negative age stereotype or providing cues that they are not the intended users of this technology" (ibid). What McGlynn et al do not consider in their study, however, is that PARO originates from Japan, and the participants in the McGlynn study were from Georgia, USA. PARO is the result of the rapidly aging population in Japan, and not enough people to help this population especially in the healthcare sector (Foster 2018). In Japan, PARO has many positive reviews and is used in several older age homes (ibid). One of the reasons for this is that "many Japanese see robots positively, largely because they are depicted in popular media as friendly and helpful" (ibid). Therefore, whether or not the negative age stereotype applies here is debatable; as this is an example of the role culture plays on how we perceive technology, and how subsequently we allow ourselves to get attached or not. I think that PARO is important to consider since its main purpose is one that deals with a health issue, the care of seniors, and loneliness is considered a health issue; which raises the question whether PARO could be used to treat lonely people. This is significant since, as explained by Kiron and Unruh:

Technology isn't just a cause for the loneliness epidemic, as many suggest. It's also possibly a solution. The early popularity of social robots suggests that there's quite a bit of pent-up demand for non-pharmaceutical alternatives – not only to address loneliness once it sets in but also to stave it off in the first place (Kiron and Unruh 2018).

The Case of Call-me-Robby

Hoorn claims that when considering loneliness in older adults, most interventions that exist focus on the negative, that is, attempting to “diminish” loneliness (2018: 1). Hoorn argues for a different approach to loneliness, one that focuses on a positive intervention, for example, improving resilience through the use of robots (ibid). Hoorn argues that those who can be positive, who can be resilient, can then undermine the loneliness they feel. Humanoids, which are robots that resemble humans, come in to play as “facilitators” of this trajectory away from loneliness (Hoorn 2018: 2). Hoorn wants robots to coach humans towards greater resilience. In his study, Hoorn suggests a robotic intervention, “Call-me-Robby!”, which simulates a conference call amongst friends. The conference call has robots converse on the phone while, their users listen; anonymously, the users can interject during the conversation or just listen as the robots speak. Since the robots can converse with their users alone, robots are programmed to “remember” issues or topics brought up by the user, and later on the robots refer to these issues as their own during the conference call to promote the participation of users (Hoorn 2018: 11). Hoorn believes that having these conversations could improve social skills, social support, social contact and maladaptive social cognition (Hoorn 2018: 13).

The Case of Nao and iCub

In less than 30 years, research on Human-Robot-Interactions (HRI) has become its own specialized field (Jones 2017: 559). This is due to humans beginning to interact with robots in a wide range of diverse ways. In 2010, the fifth annual HRI conference “Grand Technical and Social Challenges”, took place in Japan. The conference centered around the idea that “robots may become our co-workers in factories and offices, or maids in our homes. They may become

our friends” (ibid). Despite this being a reality, what the conference failed to incorporate, and what was noted by Diocareetz and Van den Herik in 2009, is the issue of “the personal and intimate relational dimension between a human and a robot” (ibid). This is significant since researchers are working to make technology more human-like. Goodrich and Schultz when talking about the Human-Robot-Interaction (HRI), created a concept known as “dynamic interaction” which they argue is the “conceptual cornerstone” of HRI (Jones 2017: 559).

Dynamic interaction “places the emphasis on shaping the types of interactions that can and will emerge as humans and robots interact” (ibid). Goodrich and Schultz’s notion “of a dynamic interaction directs attention to interactional patterns that evolve in a self-regulatory way: the operator becomes more skillful and the robotic system, too, learns and adapts to its user” (ibid).

The advancement of artificial intelligence has contributed greatly to the depth of HRI. The dynamic interaction of robots can apply to all robots, as the dynamic is “a prerequisite to improving the efficient performance of the task” as the actions of both “operator and machine flow together in synergy to effect and perfect the performance of the task” (ibid). In the case with social robots, “the focus is on interactions that are themselves the task being performed. The assistive or companion robot does something for the human with whom it interacts” (ibid). For example, interactions with PARO, a non-pharmaceutical alternative to elder care that provides happiness through attachment (Kiron and Unruh 2018). Furthermore, as will now be demonstrated, robots such as Nao and iCub are being used to test how to develop human cognition. Therefore, their interactions have more depth than PARO’s.

Nao and iCub are social, humanoid robots, and were designed to be “on the design of living machines that humans should perceive as realistic, effective partners, able to communicate and cooperate with them as naturally as possible” (Anzalone et al 2015: 465). Nao and iCub are

social robots developed to have a high degree of artificial intelligence (ibid). Anzalone et al describe artificial intelligence as a robot having “the whole set of social and cognitive abilities” that will allow for interactions to be human-like, by exchanging “verbal and non-verbal communication, learning how to predict and adapt to the partner’s response, ensuring engagement during interactions and so on” (ibid). In order to achieve this kind of intelligence and to have seemingly human agency with cognitive and social capabilities, multiple algorithms are implemented into the robot including: multimodal people tracking, face recognition, object learning, motor skills learning and action synchronization (ibid). All of these are meant to develop the interaction between humans and robots.

In Anzalone et al’s study, Nao and iCub were placed into interactive scenarios: one being taught by a human, the other being taught by a human amongst children, including some children with autism. In both scenarios, the focus was on “the nonverbal behaviours expressed by the human partner,” and the effects this had on the robot. It was found that “a correct comprehension and proper use of nonverbal behaviours are essential tools to achieve an ‘optimal’ interaction: to provide readable behaviours, and to arouse on human partners the illusion of social intelligence” (Anzalone et al 2015: 273). Robots were useful when trying to develop social cues and developing social skills. In Taniguchi’s loneliness research, it was concluded that social anxiety and lack of social skills was one of the reasons people isolated themselves from others. Despite the fact that Nao and iCub were not meant to deal with loneliness, the existence of social robots, and the efforts to continuously give them more human-like qualities in order to interact on a deeper level, shows a want for new social networks to form.

The Case of Erica

Shiomi et al consider HRI in terms of touch, or as they say “haptic interactions” (2018: 3773). Haptic interactions are interactions that involve being touched, or touching, haptic technologies replicate and transmit touch-like sensations through a network; we see this in PARO when people pet it. However, Shiomi et al specifically look at the “comfortable distance” between human and robots; in other words, they investigated how a social robot should react before being touched, and what distance is appropriate for a reaction (ibid). Shiomi et al used a commonly known humanoid – Erica. Modeled after a 23-year-old woman, Erica was created in Japan and is “an advanced android designed as a research platform to study human-robot interaction. [She] understands natural language, has a synthesized human-like voice, and can display a variety of facial expressions” (IEEE 2018). In their study, Shiomi et al found that 20 centimeters is the “comfortable distance” at which a robot should react to a human’s touch (2018: 3779). Participants also preferred when Erica responded before being touched as opposed to after (ibid). The reasoning that was given for this was that “people might assume that since the robot has human-like capabilities to being touched, they prefer a robot that reacts before being touched as people do” (ibid). This shows that the more humans interact with robots, and the more developed robots are with anthropomorphic technologies, the dynamic between human and robot changes.

Social robots are a new type of robot whose major purpose is to interact with humans in socially meaningful ways. In other words, social robots are designed to evoke meaningful social interaction with their users (Lee et al 2006: 962).

We see this in another case that involves Erica; where she is now moving beyond being a research robot to potentially being a news anchor in Japan.

The Case of Sex Robots

John Danaher, a well-known researcher in the robotic field provides a definition for sex robots:

... any artifact that is used for sexual stimulation and/or release with the following three properties: (1) a humanoid form; (2) the ability to move; and (3) some degree of artificial intelligence (i.e. some ability to sense, process and respond to signals in its surrounding environment) (2014: 72).

The first advertised sex doll appeared in 1968, when it became legal to buy sexual devices through the mail (Vice 2016). These dolls were not as sophisticated as they are today, and were sold through porn magazines (ibid). TrueCompany created two prototype models, Roxxy/Rocky, and RealDoll (Danaher 2017: 6). Roxxy, the first sex robot (different than a doll), was created by Douglas Hines and was unveiled to the public in 2010, in Las Vegas at the AVN Adult Entertainment trade show (ibid). After the conference, Hines received 4000 pre-orders for his sex robots (Morsünbül 2018: 424). Roxxy had two models: RoxxySilver and RoxxyGold (Danaher 2017: 6).

The “silver model” – priced at \$2995 at the time of this writing [2017] – can engage in “sex talk.” The “gold” model – priced at \$9995 at the same time – has preprogrammed personality types and can “hear” when you talk. The personality types include “Frigid Farah,” “Wild Wendy,” “S&M Susan,” “Young Yoko,” and “Mature Martha” – all names rich in sexual overtones and innuendo (ibid).

Users can program the personalities on their robots, or if they prefer, they can swap them online. This idea was advertised by the manufacturers as “the same as wife or girlfriend swapping without any of the social issues or sexual disease related concerns!” (ibid). Roxxy is quite real in the sense that she has a heartbeat and circulatory system, as well she can “gyrate” and “move her private areas inside”; however, she cannot move by herself, other than her head and parts of her face when talking (ibid). Despite Roxxy and her male counterpart Rocky, not being confused for humans, a recent Vice documentary interviewed one of their journalists before and

after sexual intercourse with one of the robots, and the journalist was shocked by how much they enjoyed themselves, and how human-like the interactions ultimately felt.

In 2015, there were 22 sex doll factories across 7 countries (Nast 2017: 760). Sex dolls are anatomically correct and are used for “sex, art, love, and companionship” (Vice 2014). The demand for sex dolls to be more realistic and to become more human like has increased to the point that clients can request for dolls to have personal imperfections to make them more human, such as scars and birthmarks (Vice 2014). In addition to sex dolls, the experience VR provides can satisfy similar needs (Vice 2016). These technologies have the potential to help people, for example those who are shy and in need of companionship.

RealDoll is a product by Abyss Creations, which was founded in 1995. Their dolls sell upwards of \$6000. A multitude of preset dolls with faces and personalities are available and there is the option of building your own. As described by the founder, Matt McMullen, the hardware is the same for all the robots, so you buy one robot, but can then change it. For example, in a video on the site, McMullen takes the “skin” off the face of the robot, to which Harmony the robot says “hey put my face back on” (Abyss Creations 2018). McMullen explains you can buy multiple faces, and when you buy the app you can create your own personalities with distinct voices, therefore creating a scenario of multiple characters that run on the same hardware (ibid). McMullen claims that the robots were created to be simple, accessible, and easily repaired by the users (ibid).

Despite being sold as sex robots, these robots are more. When introducing herself, the sex robot Harmony says, “I am Harmony, the world’s first affordable robot with a practical purpose for home use or in bedroom use” (ibid). Similarly, in the Vice documentary, *Making the world’s first male sex doll*, the sex doll company Synthetics claims that people have been treating their

“dolls” or “robots” as their significant others, as it is “easier than a Tinder date” and many feel as though they are in control (2016). In some ways, this shows that these kinds of robots appear to be so similar to humans, that some individuals are replacing them with humans, as they are able to create attachments and bonds to these technologies as they would a real human. This is significant for lonely individuals who desire but lack both mental and physical stimulation from other humans.

Despite the robots not being real, and sex with a human has yet to be replaceable, the creator of Synthetics noted that “there are not enough words in the English dictionary to describe love, affection, and attraction” referring to the connections being made with their products (Vice 2016). For example, there is an online community called “iDollators” wherein members “view their dolls not merely as sex toys but as life partners” (Danaher 2017: 11). In 2018, Melody Gilbert released a documentary called *Silicone Soul*, looking at people and their close relationship to non-human but human-like dolls and robots. The documentary, shows individuals living with, loving and even getting married to their dolls/robots, and gives these people space to explain their complex relationships with the dolls/robots. One woman even says she uses the dolls as replacements for friendships she wishes she had. At the extreme, it even shows individuals who have baby robots and treat them as living babies. Interviewing a psychologist about the matter, it was concluded that many of the people featured truly believe they are having, and are having, full-fledged relationships with the dolls. This raises questions whether or not we are losing our ability to interact with other humans, and opting for these other relationships that are “easy and in our control” (Gilbert 2018); or whether or not we are creating a whole new set of social relations and social networks. “Just because it is weird doesn’t mean it’s bad,” one of the interviewees in the documentary stated (ibid).

Despite the documentary focusing on dolls, as opposed to robots, it is argued that these dolls will be replaced by robots once pricing becomes reasonable. This would be a game-changer, since as seen in the documentaries, the close relationships that have formed with dolls who cannot respond and with only imaginary identities, will only be exacerbated once the situation is replaced with relationships between robots and humans.

The Case of Lovotics

Dr. Hooman Samani, a professor in Taiwan, and director of the Artificial Intelligence and Robotics Technology Laboratory, proposed the concept of “lovotics,” as a research domain, which combines multiple areas of research and looks at human-to-robot relationships, in order to explore the possibility of robots being able to fall in love with a human, and vice versa (2011:118). This is done through the use of artificial intelligence that makes up: “the artificial endocrine system that contains the physiological bases of love, the probabilistic love assembly that is the psychological foundation of being in love, and finally, the effective state transition based on human emotions” (ibid). Dr. Samani combined all of the above with the intention of simulating love. However, Dr. Samani acknowledges that because the feeling of love is simulated, that a new definition is needed to encompass this created feeling: lovotics (ibid). The definition of lovotics stems from Aristotle’s concept “philia, a dispassionate virtuous love” (ibid). Lovotics looks to “explore the notion of bi-directional Human-Robot love” and where the future is “a place where humans have robots as friends and possibly even life partners” (ibid: 119). Dr. Samani is not the only one; many scholars, most prominently, David Levy, argue that human-robot relationships are the future, since the more realistic these relationships become, the

more genuine feelings are evoked, and “love” may be felt between user and robot (Sullins 2012: 398).

Attachment Theory

As HRI becomes more complex, the attachments between human and non-human become stronger. This thesis hypothesizes that anthropomorphic technologies are more likely to ameliorate loneliness than any other kind of technology; and that furthermore, lonely people are likely to be receptive to it, because lonely people desire human attachment. As technology becomes more human-like, attachments can be found elsewhere, which coincides with Feng’s idea that “failed interpersonal intimacy motivates people to seek material possessions as the focus of secondary attachments” (2016: 1650). Levy points out a phenomenon known as “material possession attachment” which was explained by Feng as well, wherein “attachment to a material possession can develop into a stronger relationship as a result of the possession’s repeated use and the owner’s interaction with it” (ibid). This is possible as robots are being created with more ways in which humans can interact with them. As a considerable amount of research is aimed at discovering how we can deepen the interactions we have with robots.

The Uncanny Valley

One argument against the movement towards these technologies, and one that considers a negative reaction to these technologies from people, is the idea of the “uncanny valley.” Rooted in Freud’s idea of the uncanny, the “uncanny valley” is “the proposed relation between the human likeness of an entity, and the perceiver’s affinity for it” (Mori 2012: 99). Mori traces our affinity for robots, and notices that it increases until it hits “a valley” which marks the spot where

robots are very similar to humans but we are still able to differentiate between them and us and this evokes an “eerie” and uncomfortable feeling (ibid). The example Mori gives of this is that of a robot smiling. He explains:

One robot had 29 pairs of artificial muscles in the face (the same number as a human being) to make it smile in a humanlike fashion. According to the designer, a smile is a dynamic sequence of facial deformations, and the speed of deformations is crucial. When the speed is cut in half in an attempt to make the robot bring up a smile more slowly, instead of looking happy, its expression turns creepy (ibid).

Despite trying to mirror humans, when the robot appears to be one but is not convincing enough, it makes us uncomfortable. Therefore, Mori urges robot manufacturers to avoid the uncanny valley and to keep a reasonable distance by creating nonhuman designs (ibid). Mori gives an example of prosthetic hands. He claims that instead of trying to create technologies that would create a prosthetic hand to feel like a human hand, we should consider prosthetics made out of wood: “the fingers bend freely at the joints. The hand lacks fingerprints, and it retains the natural colour of the wood, but its roundness and beautiful curves do not elicit an eerie sensation” (ibid). So, we can have technologies that resemble human form but we must be able to distinguish the difference between real and unreal easily.

Either way, the demand for robots is increasing. As the technologies develop, people are able to create, or at least think they are creating, quality relationships with robots. An increase in face to face interactions with robots affects us psychologically and sociologically:

... the loved and trusted robot is extricated from the material domain and is installed in the social. The talked-about robot ceases to belong to the category of objects we love, personal things to which we are sentimentally attached; instead, it is talked about as we ordinarily talk about someone we love and trust, and who may love and trust us in return. The robot as an object formed in discourse is thus imagined into a dialogical space (Jones 2017: 559).

This new dialogue influences social dynamics, and ultimately culture. It opens the idea that not only can the experience of loneliness be ameliorated with the intervention of the non-human, but that people will recognize the legitimacy of this, and not think it is “weird” to do so.

Dating Sims

The Case of Online Dating

Artificial intelligence is present in all technologies or systems where tasks are being performed that require human intelligence; in other words, it is when non-human systems appear to understand and respond like humans. Despite AI being used in robots as well, I think it is important to highlight the effect that just AI can have, without a body attached to it. This section focuses on the use of artificial intelligence specifically in terms of online dating, and will demonstrate how meaningful connections can be made, with humans as well as non-humans.

The introduction of the internet has since widened the number of people that one can communicate with since around 2 billion people have access to the internet (Finkel et al 2012: 4). When it first came into cyberspace, online dating provided: “access to potential romantic partners, communication with potential romantic partners, and matching with compatible romantic partners” (ibid). Online dating is popular because humans have shown that it is a necessity to connect deeply with others and that those that are in relationships experience better health and overall increased happiness (ibid: 5). People who are lonely tend to not be in relationships and are at an increased risk of depression and illness (ibid). A case can be made that lonely people should use online dating sites, as these sites attempt to promote and foster intimate relationships.

At first, these kinds of sites were straightforward, you would see a profile and opt to message the person or not, and if all goes well you would meet up, and perhaps start dating.

However, as artificial intelligence develops, online dating has many different facets. For example, now most online dating websites and apps have algorithms that identify who they think would be a good match for you, and then they suggest it (ibid). Some online dating websites artificially monitor your conversations and then suggest things like meeting up, and can even provide examples as to where to meet up based on the messages exchanged between the two users (Silva 2018 n.p.) The reason for using artificial intelligence is “to fight the growing fatigue from searching through profiles in vain, the online dating sector is turning to artificial intelligence to help arrange meetings in real life and act as a dating coach” (ibid). One app that is currently being tested is AIMM, which uses AI “to mirror a human matchmaking service” (ibid); in this app, you talk to an artificial voice that asks you questions about yourself and relationships, and instead of suggesting who to match with by showing you their profile, the app instead talks to you like a person and tells you about the potential match based on information you would have otherwise found on their profile. It can give you advice like, “based on her personality inclination she is a traditional person, I would recommend dinner and a walk” (ibid). The app can also provide advice, for example about things to mention about yourself during the date, and even follows up after (ibid). The artificial intelligence creates the illusion that they know you, as well as the other person, and furthermore, that they care by providing insight and asking how it went. Users may develop a sort of trust with the app, similar to the trust and friendship created between robots that are human-like, as you interact with it face to face. For someone who is lonely, this kind of artificial intelligence could be useful in more than one way. First, it acts as someone you can confide in, and encourage socializing with others. Second, as concluded in Rokash, lonely people tend to have poor social skills, AI helps with this by providing social cues.

The Case of Mystic Messenger

Despite the invention and intervention of AI in online dating, the end goal is still to meet and potentially fall in love with a real human. This is not the case with all online dating. In 2013 Vice aired a documentary called *The Japanese Love Industry*, wherein the main journalist researched and experienced all different kinds of things Japanese people have invented or incorporated into their culture to satisfy the need for intimacy. Two observations relate to online dating: that there is a trend of men being obsessed with virtual reality, which is coupled with being overworked, and intimidated by real women, so they prefer cyber girlfriends over real ones. And two, that many women in Japan feel that children and partners can prove to be obstacles, especially when it comes to their careers. Japan has a whole industry for pseudo-romance.

One example of which started in Japan, but is now used all over the world, is dating sims. Dating sims are essentially video games, with romantic elements, and simulate relationships. Despite critics seeing dating sims as an indication that its users are alienated, and “retreat from human relationships in a machine-mediated society”, its users claim the opposite (Schwartz 2018 n.p.). The growing number of dating sims users, “do not see their interaction with virtual characters as a substitute for human companionship but as a new type of digital intimacy” (ibid). Users are transcending typical cultural understandings of intimacy, and are using media to “generate new forms of sexual experiences and affective bonds” (Race cited in Liu 2019: 51). These new dating sims are then new forms of intimacy that are taking place in a digital world.

In the beginning, dating sims were more or less reserved for isolated men, and thus “the action centered around erotic interactions with virtual girls” (ibid). The media used to report “with a tone of moralizing disgust” on these dating sims and the obsession that resulted with

those that used them (ibid). These games were blamed for the low fertility rates in Japan (ibid). As Japan has had the steepest decline in population in the world (Vice 2016). One man in Japan even married his favorite character from an online dating sim, and this was viewed by many as a last resort for those who simply could not find real romance (Schwartz 2018).

A more recent dating sim known as “Mystic Messenger” has become popular and caters to female users. Mystic Messenger is not only used in Japan but has users across the world. The focus of the game is to fall in love with mysterious characters, that you can communicate with through artificial intelligence. Ultimately you do not win the game with points, but rather when you reach “a good ending where you and your virtual lover live happily ever after” (Schwartz 2018). Fans of the game also participate in online forums where they discuss the game and the characters and possibly develop some kind of relationship there too. One of the characters in Mystic Messenger, Yoosung, is addicted to a computer game known as “League of Loneliness of Life.” Upon playing the game, one journalist noted that “while these characters were basically just interactive cartoon characters that would automatically respond to prompts from the player with pre-scripted answers, they felt lifelike, and talking to them required tact and social norms” (ibid). What contributed to this “real” feeling is the game ran in real time, and thus when you stop playing, that does not mean the game does, it keeps running, meaning you can miss conversations and lose touch with the virtual friends you have made: similar to real life, when you do not communicate with your friends or retreat into yourself you lose contact with people. This creates a need for users to play the game as they do not want to lose contact in the social world they have created – they do not want to end up lonely.

The Case of QQ Dazzling Dance

Created in 2008, another popular dating sim is a Chinese dancing video game *QQ Xuan Wu*, otherwise known as QQ Dazzling Dance. Liu considers the “process of the gamification of dating and assess its implications for understanding intimacies in the digital age” (2019: 38). QQ Dazzling Dance on average has 2.6 million users playing every day and advertises itself as “the most romantic video game” (ibid). Liu considers the approach that if digital dating platforms can be considered as *sites* then by “examining people’s every day and habitual engagement with digital dating media” these sites become “areas for the exercise and negotiation of “new” rules of intimacy” (ibid). Inside the game, there are different avatar designs, game modes, marriage and divorce rituals; which shows the variety of connections and attachments one can make throughout the game (ibid: 40).

Liu considers Chinese culture as one of the leading causes of the popularity of QQ Dazzling Dance. Traditionally, people used to meet romantically by social forums, for example through arranged dates, known as *xiang qin*, and these encounters were then mediated by letters and telephone calls (ibid). Over time, new forms of technology and the digitization of communication had made for the Internet to become the new form of meeting and mediating romantic encounters (ibid). Despite this being the case with other countries, China is different as “today’s China is marked by a moral panic over singleness” (Fincher 2014 cited in Liu ibid); and that being alone is a social problem. This has allowed for digital platforms such as dating sims, to “play a central role in intimate relationships” (Liu 2019: 41). QQ Dazzling Dance is also frequently played in groups, where many users were found to go to Internet cafés together and would team up to facilitate romantic encounters (ibid: 46).

Mason suggests that virtual romance is becoming “the ordinary, the everyday and ongoing” (cited in Liu 2019: 50); so, despite the popularity of QQ Dazzling Dance and Mystic Messenger in China and Japan, these games are not isolated, and as the digital age expands they will too. Liu suggests that the “gamification” of dating is best understood through the concept of “digital intimacies” (ibid). Citing Race, Liu suggests that QQ Dazzling Dance is what Latour would call a *mediator* (an object that can transform or alter their input) “as it is capable of conditioning and generating new ways in which game players experience romantic feelings and establish new forms of intimacy” (ibid: 51).

In Vice’s *Digital Love Industry*, it was said that “the definition of intimacy has become more ambiguous with virtual reality and online lives” (2013). One user of Mystic Messenger claims that the characters meet emotional needs, and allow them to “imagine other ways of loving” (Schwartz 2018).

In Japan, where this debate about intimacy with the virtual has been unfolding since the 1980s, there is a word that gives shape to the idea of loving a virtual non-human. That word is *moe*, which derives from the Japanese verb *moeru*, meaning to burst into bud. This word was originally used in ancient Japanese love poetry to describe nature blossoming into life. But within the dating sim and anime subcultures, it has come to describe the unique feeling of intimacy that one can feel for a virtual or fictional being (ibid).

The English language does not have the vocabulary to describe the new relationships and feelings forming with non-human technologies. This suggests that culture plays a part in how we react to these technologies, as well as our feelings towards intimacy and loneliness. It is not a coincidence but a social reality that some countries are open to new ways of love, and others are not. It has been the focus for the developers of dating sims to incorporate more “anthropomorphic algorithms” (artificial intelligence) to make the characters more interactive and realistic, and bring the gamers closer to the characters (ibid).

Unlike social robots, these online dating sites and sims can be used by a wider array of people, as they do not have the high costs that robots do. The increased use of artificial intelligence has led to wider uses of these technologies; online dating can be more than just retreating into oneself, it can be a place to engage socially with humans and non-humans alike in varying capacities. These technologies can make it easier for lonely people to meet others and form relationships, as technology is used to mediate these meetings.

An argument arises that “computer-mediated conversation” does not equal face to face interaction (Wiederhold 2015: 297); and this is an issue to consider with lonely people. One of the primary indicators of loneliness is the lack of qualitative relationships with people. Since online you can interact with humans and non-humans two issues arise: that these interactions cannot replace face to face interactions, and that the interactions are not real if the people are not. I think that in North America, where the culture is not as open to acknowledging online dating sims as legitimate relationships, those that engage in them can find themselves isolated from the rest of society. However, in other cultures such as Japanese and Chinese cultures, where people accept that these sites are so immersive that there are quality relationships and attachments being made with both humans and non-humans. As defined by Bouwman et al, loneliness is the result of a “mismatch between social relationships one has and one desires” (2017: 793), and their study, conducted in the US, found that online approaches to loneliness interventions can be successful (809). I think that if online social relationships, such as the ones made with dating sims were accepted and subsequently legitimized by one’s culture then this could be a way that loneliness is ameliorated.

Virtual Reality

Virtual Reality (VR), allows users of this technology to take part, in and, for all intents and purposes live in, a simulated environment. In 1991, ABC Prime did a segment on virtual reality (VR). The narrator says, “today, VR is still in its infancy, but, as computers grow more powerful, the graphics more detailed, and the sensations more human, VR will force us to ask: ‘what is real?’ It will be up to our children to find the answer” (Vice 2014). VR has developed immensely, and now uses haptic technology which has really forced us to ask ourselves: what is real?

VR can be understood in terms of liminality. In 1909, Arnold Van Gennep, introduced the idea of liminality in his book “The Rites of Passage.” Van Gennep used this term to describe a “temporary and transitional period” between two phases which an individual goes through during a “rite of passage” (cited in Boersma 2013: 107). Victor Turner expanded the concept beyond the scope of the rite of passage, and extended liminality to “describe any condition or state that put an individual ‘betwixt and between’ general societal norms” (Boersma 2013: 107). Furthermore, Turner came up with the term “liminoid” to specifically classify events that are similar but not limited to rituals, and which individuals have the option to attend or not (Boersma 2013: 108). Esther van Heerden offers set criteria for what constitutes a liminal event. She writes: “This suspended or liminal state, according to literature, presupposes a number of things: a ‘different reality’; the insignificance of everyday concerns; the engagement in unusual activities; and the application of special rules” (Van Heerden 2011: 54). We see this in VR, where anything is possible, there are no “everyday concerns” and we can engage in various activities we would not be able to otherwise, and there are no rules to follow. The concept of liminality and VR is described by Shields:

Like liminal zones and events, virtual spaces are ‘liminoid’ in that they are participated in on a temporary basis, and distinguished from some notion of commonplace ‘everyday life’. Virtual space is not only betwixt and between geographical places in a non-place space of telemediated data networks, but participants take on specific ‘usernames’ or identities, and many surreptitiously engage in activities they might not otherwise consider (2003: 13).

Despite the fact that dating sims can also be considered liminal zones, I think that due to VR’s increased immersion technologies, the experience is heightened for VR users.

Virtual reality has become so popular these technologies can be purchased and experienced at home. VR has been advertised as a fun way to escape into a different world and experience things not normally possible: walking across a tightrope in Manhattan, or a grandmother riding a rollercoaster. Some users have quite realistic reactions. This is significant since their genuine reactions can be understood as users genuinely experiencing whatever is programmed in their VR; as these experiences are highly immersive, and VR is ‘betwixt and between’ different realities, I suggest that this makes it easy for users to blur the line between what is real and what is not.

A particular technology, teledildonics, which are “sex toys mutually controlled via online connection” have become part of the immersive experience in VR. In 1991, Howard Rheingold published *Virtual Reality*, wherein he proposed the concept of *teledildonics*, also known as cyberdildonics, which he argued was “a conjectural and projective formulation that anticipated how, in a somewhat near future, the technologically mediated sexual relation would allow, in a certain way, the overcoming of physical distance” (Faustino 2018: 244). Teledildonics are “a form of digital-mediated sexual interaction” (ibid: 243). In 2014, a Vice journalist attended a VR conference in California, where one of the main attractions was VR pornography. A VR programmer teamed up with pornography stars to create a program in which real porn stars are fabricated and viewers may have a VR experience with them that appears real. This program

allowed viewers to experience sex with someone who is technically a real person (Vice 2014). These experiences in virtual realities can be categorized as liminal events, where there is a suspension of societal norms, which leaves anything possible.

Many companies have capitalized on VR pornography creating ways to make the experience more immersive and more personal. For example, Kiiroo, a company based in Amsterdam, combined VR with haptic technologies (i.e advanced sex toys) to create a very real experience for its users. One of Kiiroo's slogans is, "we use tech to forge new and better ways for people to connect, because, in an increasingly digitalized freelance world, the need is growing every day (Kiiroo 2019). What these technologies do, and what Kiiroo provides, is the "possibility of reciprocal physical stimulation between agents, without their reciprocal presence and direct physical contact" (Faustino 2018: 245). Through Kiiroo, you can simulate sex with a partner or with an artificial person in a virtual reality; as explained below by Kiiroo:

Teledildonic devices send and receive tactile data, which involves a whole new sense in online communication: the sense of touch. Teledildonic devices send and receive tactile data. Some of them vibrate, some compress and some stroke – each has its own way for simulating sexual movement between two people. All this technology that responds to movement and touch is called haptic technology (cited in Faustino 2018: 247).

Lovesense, a company based in Hong Kong, is similar to Kiiroo, except their technology is designed for two users, both of whom have a haptic technology (sex toy), wherein the movement by one user is then replicated simultaneously for the other user; all the while both users are looking at a screen into the simulated environment they have chosen. VR and the haptic technologies are the latest advancements in the nascent realm of cybersex (the latter is defined as "sexual acts performed through the medium of digital technology" (Reed 2014: 111)).

Despite these technologies being advertised for partners who are in a long-distance relationship (and are arguably lonely, and missing their partner), they have since expanded. On

their website, the products are separated based on “for him, for her and for couples.” For him, you can buy the porn star experience, where your sex toy is coupled with over 4000 interactive videos (in both 2D or VR) with the porn star of your choice. The ability to interact with virtual porn stars is only available for men, and not for women or couples. Women and couples are limited to the avatars that are provided by the game, or with their significant other with the necessary technology.

The demand for the expansion of cybersex has less to do with people wanting more sex but rather, the popularity of people using the Internet for sexual purposes. In 2013, Daneback et al examined the characteristics of people who have reported sexual fulfillment of their desires by using the internet (26). Similar to online dating and sims, anonymity and virtual proximity make sexual fulfillment online popular (ibid). Daneback et al found that majority of their respondents used the internet for sexual purposes, and had their sexual desires fulfilled. Furthermore, it was discovered that neither biological sex nor sexual identity had an influence on who would use the Internet more often for sexual needs (Daneback et al 2013: 29). They did find that age, however, was a predictor, with the age group 25-34 being the most likely to use the Internet for such purposes (ibid: 30). Moreover, it was concluded that, “the more interactive sexually related online activities internet users engage in, the greater fulfillment of sexual desires they may experience” (ibid). Limited research has been done to examine the type of people using these kinds of technologies. Younger lonely people are using VR as opposed to robots, as they are more likely to understand the technologies, be open to virtual realities and exploring different experiences, and the cost is still nowhere close to the cost of robots.

What has become apparent when considering loneliness and the use of these technologies is the blurriness between the human and non-human. Our social networks are evolving to include

technologies that allow non-humans to engage and interact with humans on new levels. The development in these technologies have given them “greater emotional, linguistic, and social sophistication” (Kiron and Unruh 2018); the social implications of this are “if part of what makes us human is to connect emotionally with others, and technology increasingly plays the role of emotional connector, what it means to be distinctively “human” becomes a much more complicated question” (Kiron and Unruh 2018). As our technologies develop from robotic dogs to robotic sex dolls, to dating sims and new interactive virtual realities that can foster virtual relationships; which are what lonely people think they are missing, then why are we not using them more often.

Chapter 6: Discussion

Loneliness

Anthropomorphic technologies could be a way in which the issue of loneliness, and how it is experienced can be ameliorated. The genealogy of loneliness demonstrated that humans desire attachments to other people; and that this has become more of an issue the way our society is evolving. By the end of the genealogy it was apparent that technology was exacerbating the issue of loneliness since, despite its aim at increasing the ways in which we could communicate, it fractures the human-to-human interaction.

In the non-human genealogy, it became apparent that there has always been a fascination with the non-human, but that the uses of the non-human have varied throughout time. The implications of this are that they are not being constructed to be viewed in one way, and we should be open to the idea that their uses can and should vary. As well, what was apparent with the non-human was that there has always been a fascination with making them appear to be human, which has led to the idea of anthropomorphism. As we develop anthropomorphic technologies, they need to be understood as technologies that transcend the boundaries of the non-human, since the concept of the non-human is limiting their abilities.

In the case studies, there were several examples that showed the possibility of social robots aiding in the area of health issues. Loneliness is considered by many a health issue as the result of experiencing loneliness can have negative effects on one's health. As these technologies are essentially human-like, it is significant that they are not being considered more seriously to treat loneliness. Furthermore, I found that the prominence of dating sims in China and Japan were significant since despite online dating being popular in the West, dating sims are not. I found that the combination of the genealogies and the case studies that it can be deduced that

barriers to these technologies having more of an influence is due to the negative cultural implications of using these kinds of technologies.

The idea of culture playing a determinant role in the use of robots is significant since the case studies demonstrated the wide array of attachments that humans can make with these technologies.

Ethical Implications

As a response to the advancements made in anthropomorphic technologies, that have made us question the line between human and non-human, Kiron and Unruh posed the questions: “can we make and sell this?” and “should we make and sell this?” I think that this is especially important to consider since as seen above, whether we want to admit it or not, there is a significant possibility that humans can and will create attachments to these anthropomorphic technologies. I think that this can be a positive thing, especially in terms of loneliness; however, we must be wary of some of the outcomes that can result from these attachments.

Before considering the ethical and social implications of using anthropomorphic technologies, I want to briefly discuss the idea of these technologies being considered “tools”. In Shaviro’s account of *The Universe of Things*, it is noted that the main difference between humans and aliens is the aliens’ technology. Unlike human technology, alien technology is “intrinsically alive” (2011: n.p). That the aliens are not separate from their tools, they are part of the aliens themselves; and so, the aliens “exteriorize themselves in every aspect of their environment. Their networks extend far beyond their own bodies and immediate surroundings” (ibid). The Aliens, Shaviro concludes are alive in a “living world” and this scares humans who are naturally mechanic, and thus in this story the human wants to “return to the loneliness and

security of the customary human world: a world in which objects remain at a proper distance from us, because they are dead and safe” (ibid). I think that despite thinking that our tools are passive and static, they are not. We must realize that anthropomorphic technologies resemble the alien technology, they are active, and can be used in many ways.

In their book, Reed suggests that “cultures create technologies, and the extent to which a given technology comes in time to alter culture is never a simple one of technology dictating society” (2014: 10). This is because humans are active users; we are constantly engaging with technology, and developing and creating new uses of these technologies. As Marshall McLuhan remarked: “we shape our tools, and afterwards our tools shape us” (cited in ibid). Therefore, as our tools, our technology takes on life, and begins to shape us, we must consider: “what can it do for us, but also what can it not do for us, what are its limits, and what do we not want the tool to do” (Reed 2014: 11).

Consent

In 2019, one of the most prominent social movements is “#metoo”. The movement is against sexual assault and sexual harassment and has prompted women around the world to share their stories and experiences to heighten awareness surrounding these issues. For example, a prominent issue that has emerged from #metoo is the concept of consent. Consent is defined as an ongoing agreement between individuals throughout a sexual encounter; and is only gained when both individuals have consciously communicated their consent. The question this presents is whether consent should also pertain to all realms of sexual activities, including cybersex, and sex with non-humans.

A study from Newcastle University, “found that VR porn could make some of the more degrading and abusive elements found in some pornography seem more ‘real’” (Blair 2017). For example, violence towards women and family members is often normalized in pornography, and due to VR’s immersion technologies, these fantasies can be acted out by users in a virtual world. It became apparent through the participants that there was a “disjoint” between virtual and real reality (Blair 2017). When asked to describe a situation of a man using VR for the first time, participants were divided in their responses; one group with a normal sexual encounter the other with a precarious one. Those who wrote about a precarious experience raised issues as their stories were included sexual acts that are typically not accepted by society, as they were degrading towards women, involved scenarios where individuals imagined forcing themselves on to women, and violence (ibid). The lead author is quoted saying that the study highlighted the issue of consent, and “what consent means in VR experiences” (ibid). This study suggests that in some cases, consent means nothing during VR experiences; allowing for an unsafe sexual encounter to take place. The study does not suggest that VR porn cannot be used productively, claiming that if designed properly VR porn could influence its users’ behavior; for example, practicing safe sex and enforcing consent.

Although people, in general, should always be held accountable for their actions, even in a virtual world; I think that the people that create these technologies should be aware of the issues that may arise and actively acknowledge them. By being aware, manufacturers can impose limits on what their users can do, or encourage prosocial behavior. The website for Lovesense, the company that creates haptic technologies which can be used with VR, uses as one of their slogans “let him control you”. Similarly, one of Kiiroo’s slogans is “experience the sensation of penetration online. Touch people over the internet. Feel people touching you”. Neither of these

promotes consent, they seem to go against the idea. Although these technologies can be used with another human, who would have the ability to consent or stop when they want to: what happens when users are partaking in these activities with a non-human? Since the technologies are marketed in a way to promote the simulation of all sexual fantasies being possible, does this allow for the sexual assault to happen? If individuals are encouraged to act on their sexual fantasies in VR, at what point will they act on it in real life? On the one hand, the VR experiences can be viewed as a safe outlet for those with harmful sexual fantasies; when acted out on a simulated avatar technically no one is hurt, as it is all fake. This complicates the need for consent, as in this case it would not be used. On the other hand, these harmful experiences could, in turn, affect how users then interact with real people; if users get used to how they act in a virtual world they could transpose these behaviours to the real world. This is especially important to consider when many people have acknowledged the apparent blurriness between what is real and what is not.

This issue is exacerbated with sex robots. Since these robots do not meet the criteria for personhood, legally and morally (which will later be discussed), there are no laws or rules that protect these objects (Danaher 2014: 73). As robots have become more real through technology, many humans are developing substantial, and intimate relationships, especially with sex robots; if humans are given free reign with what they are allowed to do with these technologies, it could contribute to the reinforcement of negative behaviours that could then be an issue in the outside world. Unlike VR, sex robots are not simulated, they are real, and physically exist in the real world. As well, sex robots are not avatars (which could or could not resemble humans), they are created to look and feel like a human. Therefore, when someone is abusive towards a sex robot it raises the issue of them being abusive towards a human.

In Canada, there has been extensive legal debate concerning the laws around sex work. One of the main issues presented in *R. v. Bedford* are the conditions in which sex work takes place, and whether or not sex workers are protected from harmful environments. In 2017 the City of Vancouver announced the opening of a sex doll brothel, Bella Dolls. In terms of legislation and regulations, the only matter being discussed was zoning laws, and that there are no municipal bylaws that would prevent the operation of this business. Instead, Bella Dolls encourages their patrons to “forget the restrictions and limitations that comes with a real partner” and advertises their “ladies” one of which, Deja, is “naughty, kinky, rough and doesn’t care if you hurt her” (Robinson 2018). Despite the fact that the marketing director of Bella Dolls, Ally Chan, claims that they do not promote aggression, it is clear with this kind of advertisement and technology that aggression is still possible. This contrasts with Toronto, where Aura Dolls, a sex brothel was shut down “as an old bylaw prohibited ‘adult entertainment parlours’ in that area; and that furthermore, Kinky S Dolls, Toronto’s first sex doll rental business does not tolerate aggression towards their dolls (ibid).

The onus to create technologies that are representative of societal norms falls on the manufacturers; there should be some form of regulation as these technologies are being created all around the world. They are supplying to a demand; whether or not this demand should be supplied in the first place is another question. Either way, the production of sex robots should be one that complies with societal norms such as consent. Researcher John Danaher points out that one way to achieve this is by making it possible for sex robots to “deliberately mimic signals of non-consent” (2014: 74). Danaher points out that the sex robot Roxxy, can be programmed to have the personality “Frigid Farah”; who, Lovesense, the company describes her as “if you touched her in a private area, more than likely, she will not be too appreciative of your advance”

(ibid). The fact that Lovesense has a prototype for this kind of behaviour shows the demand for it; as does the multiple advertisements for this kind of behaviour for these technologies. The examples of Lovesense and the other companies show that they are actively encouraging sexual advances despite a clear indication of non-consent.

Danaher suggests that “whatever the case may be with Roxxy, I take it that anyone who engages in (penetrative) sexual activity with a robot that signals non-consent is engaging in an act of robotic rape” (ibid). The reason for taking this matter seriously is because people that use these kinds of technologies can be susceptible to being conditioned to acting or reacting a certain way based on their interactions with these technologies. Therefore, some researchers like Danaher, want to have criminal regulations imposed for robotic rape, and other possible sexual assaults, such as child abuse. Danaher argument is that the objective of criminal law is “to regulate conduct that is morally wrong” and that “robotic acts of rape and child sexual abuse fall within the class of morally wrong but intrinsically harmless conduct” (2014: 76). The reason Danaher advances the need to regulate online and virtual behaviour is the ethics surrounding virtual acts have existed for years now, starting with video games; but that sometimes there are particularly disturbing representations that need to be considered (2014: 82). He gives two examples that correlate with the issue of robot rape and child sexual abuse which he argues are particularly disturbing acts: the 1982 game *Custer’s Revenge*, and the 2006 game *Rapelay*:

Custer’s Revenge was a 1982 game in which the goal was to direct a cruelly-pixelated, naked avatar of General Custer to rape a Native American woman who was tied to a stake. *Rapelay* was a 2006 game in which the goal was to stalk and rape a mother and her two daughters (ibid).

Despite the obvious issue that there are users who play these games, there is always the issue that someone had to manufacture the games to begin with. By playing these games, the users are being allowed to express these highly harmful attitudes, which only becomes more realistic as

our technologies develop. Danaher refers to another scholar Patridge, and argues that these virtual representations can “have an incorrigible social meaning” (2014: 84); what Patridge means by this is that, “if a virtual representation has an incorrigible (and morally problematic) social meaning, then there is a limit on the range of reasonable interpretations of that representation” (ibid). As is the case in Rapelay and Custer’s revenge there is clearly a moral issue – rape and violence; and “if a player fails to notice the limited range of reasonable interpretation – (...) for example by enjoying or laughing at these representations – then they must have an improperly developed moral sensitivity” (ibid). And because of this, we can make negative inferences about the users’ moral character.

This is important since studies have shown that “sex crimes occur because of the deviant sexual fantasies of the offender” (Kim et al 2012: 1608). Although there has been some support to indicate that these games would eliminate the need for sex offenders to look elsewhere, there is not sufficient evidence that this is the case. Furthermore, “sex offenders are reported to be experiencing an intense sense of isolation and resort to committing sexual activities to relieve such loneliness and to satisfy their need for intimacy” (ibid: 1611). This is an issue since child-sized dolls are already being manufactured in Japan and China, and as we have seen, it will only be a matter of time until they are robots.

As a society, there should not be robots for pedophiles to satisfy their needs. Manufacturers are not being held to an ethical standard. As seen above, these technologies have been advertised with clear misogynistic undertones, whether it is games about raping women and children, to slogans that allow for men to control you, or the blatant disregard for consent, it is clear that these technologies do not reflect societal norms. As well, there is limited research that proves the effectiveness of these kinds of technologies. Despite claiming that these technologies

could be used as alternatives, there is not sufficient data that proves people will not want the “real” thing after a certain time. This must be considered since these technologies are becoming more real, to the point that lines are being blurred between the virtual and real worlds. We cannot assume that no harm is being done when the user can barely tell the difference of what is real.

Machine Consciousness

The debate surrounding robot rape, and the possibility of their users allowing for sexual abuse brings forth the ontological debate surrounding these anthropomorphic technologies. As we have discussed, these technologies are becoming more human, not just in appearance, but also in terms of their intelligence and capacity to make humans feel as though they are interacting with other “beings”. Our relationships with these technologies are constantly evolving; there are so many uses for these new technologies. On the one hand, this new idea of social robots is in line with Actor-Network-Theory, wherein the subject-object dichotomy does not take in to account the complexities of the HRI. This was also argued by Jones and Kong, wherein they acknowledge that there is a passivity that is imposed on the objects in this dichotomy, and as robots and other technologies become more social and intelligent they arguably are not passive objects (Jones 2017: 556). On the other hand, Jones argues that “the engineering field of social robotics could be described as dedicated to building machines that are liberated from passivity by design. Its discourse constructs entities that will step out of the lab as our ontological equals, having minds of their own” (Jones 2017: 557). When we equate technology with being human, then we are faced with the questions concerning what it means then to be a human or a person.

One argument against the ethical treatment of robots is the idea that because robots are “artefacts”, they do not possess consciousness, and so, they are undeserving of ethical treatment (Levy 2009: 210). In response to this, there has been a new discipline called *machine consciousness* or *artificial consciousness*, which “encompasses the development of robots possessing an artificial form of consciousness, artificial in the sense that the conscious behaviours are programmed into the robot. Programming might also enable a robot to enhance its own consciousness through its acquisition of new knowledge and new experiences” (ibid). This new approach of considering machine consciousness is a step in the right direction. Creating new dialogue surrounding the new abilities of robots will force people to consider their actions towards them. Furthermore, Levy discusses two ways in which this artificial consciousness can be tested. First, there is the “Turing test” (2009: 211). The Turing test considers the apparent intelligence of the technology and looks specifically at the conversations it has with humans (ibid). Ultimately if the human interacting with the technology, cannot tell the difference between whether they are talking to a computer or a person, they are “justifiably judged to be intelligent” (ibid). Stephen Pinker adds to the concept of the Turing test saying “the ultimate test is whether it could cause a real human to fall in love with it” (cited in Levy: ibid). Whether or not the person is in love with these technologies, as seen in the case studies, or whether they are in love with the idea of these virtual realities is still up for debate, but it is clear that intimate connections have been made. The second test is the “mirror test” which argues that if one is able to recognize themselves in a mirror than they have a degree of consciousness (ibid). In fact, this test has already seen success in Japan, where in 2005, Junichi Takeno at Meiji University claimed him and his team “succeeded in achieving mirror image cognition for a robot” (ibid).

This could be seen as a robot showing self-awareness and is thus suggesting some form of consciousness.

As we have seen in the cases with consent, as these technologies become part of our culture and society they have an effect on how we act within it. As argued by Levy, the reason behind giving “consciousness” to these technologies is to humanize them in order for humans to change how they view these technologies (2009: 216). The reason to humanize is so that we regard machines differently which leads to treating them differently. It is not necessarily about giving robots rights, but more so about changing how we view them in order to change how we act towards them. Historically this was accomplished with designating certain rights. For example, slaves and women were seen as property in the eyes of the law; however, when the law changed to reflect the societal views that they were persons, these groups were given a new status in society. As we have seen with the issue of consent, there is a need to regulate behaviours towards technology, that is positive and safe. As these technologies become part of our society, we must find ways to integrate them into society in a positive fashion.

The issue is then why it matters how we treat robots and non-humans. Levy suggests that, “the way we treat humanlike (artificially) conscious robots will affect those around us by setting our own behaviour towards those robots as an example of how one should treat other human beings” (2009: 216). The example Levy gives is that “if our children see it as acceptable behaviour from their parents to scream and shout at a robot or hit it, then, despite the fact that we can program robots to feel no such pain or unhappiness, our children might well come to accept that such behaviour is acceptable in the treatment of human beings” (ibid). In addition to this, if it is acceptable to be harmful towards these technologies, then we are allowing for these kinds of behaviours to be normalized, and this affects how humans are treated in the real world.

The idea of being aware that we engineer the non-human, such as our tools, and that in turn, they engineer us advances the notion that non-humans should be seen as *actants* (Shaviro 2016: 47) since they have an active role in our social world. Perhaps if we consider them as actants, our relationship with them would be more conducive to fostering positive interactions with them and would allow humans to be open to the idea of using them as a way to ameliorate the symptoms of loneliness, no matter where you are from.

Chapter 7: Conclusion

Loneliness is experienced when there is a perceived unmet desire of attachments, or close relationships. Specific technologies, such as anthropomorphic technologies are created with the intention of replicating humans and their abilities; such as forming meaningful attachments. Therefore, I looked at the issue of loneliness and considered whether or not anthropomorphic technologies could provide the same attachment that lonely people desire; and if they could not, why. I considered three different kinds of anthropomorphic technologies, social robots, dating sims, and virtual reality, to assess the attachments made, and if they could be used by lonely people.

As seen in the case studies, these technologies vary in their degree and capacity of forming these attachments with humans, but that attachments are made nonetheless, and this has contributed to ameliorating the symptoms of loneliness that one experiences. In the case of social robots, the case studies suggest that humans are able to form attachments to them. The fact that they are molded after humans allows for humans to interact with them as they would with another human; they can answer questions, respond before you touch them, have the same tactile features as humans, and even have personalities. However, I found that in general, humans find the fact that they look so human but you can tell they are not can make us uncomfortable and did not want to be considered as someone who engages with these kinds of technologies. Thus, because people have not been open to seeing these technologies as anything more than “something” they are not viewed as “someone” and this limits the attachment one can make with these technologies.

In the case of dating sims, it was apparent that they are popular in Japan and China specifically. The cases of Mystic Messenger and QQ Dazzling Dance showed the various possible attachments one can make; be it with the artificially intelligent characters in the game, or by connection with other human users who you interact with through the game. Both these games proved that it was possible to alleviate loneliness by using these games. As well, despite the fact that these games originated in Japan and China, their users expand across those borders. An explanation for this could be that not only is this technology less costly, but also because video games have had time to be integrated into our society; the concept of playing games is not new. What is new is creating attachments with players and characters.

The case of virtual reality is similar to that of the dating sims. They provide a metaphysical site for people to interact with non-humans, if they wish, or to connect with someone else (who consents to join them in the virtual world). However, where virtual reality falls short is that unlike dating sims, there are fewer examples of people getting attached through the use of VR. However, VR is still a new technology and is still evolving.

These three types of technologies provided examples that prove humans can form attachments to non-human entities which is what lonely people lack. However, two major ethical implications arose due to the nature of these technologies (the fact that they appear to be human). First, there was the issue of consent, or lack thereof. These technologies are created to respond to us, but, to date, they are not created to disagree with us. As our connections with these technologies become more intimate, (i.e sex robots, female characters in video games, and haptic technologies in VR) the issue of the

lack of consent becomes an issue. This led to the second ethical issue, machine consciousness; which raises awareness in the importance of how humans treat technology that they are interacting with. Although machine consciousness particularly applies to robots, it can encompass our behaviour towards all anthropomorphic technologies. These ethical implications are important to consider since we live in a world where the non-human coexists with us, they are active social players, and thus they must be treated as such.

It is concluded that anthropomorphic technologies can ameliorate the symptoms of loneliness, and thus the issue as a whole. Due to this finding, and the explanatory, as well as the exploratory nature of this thesis, there are many avenues of research that is presented throughout.

Limitations and Future Research

I acknowledge that there are several limitations to this research. First, there is a limited amount of research that tests the use of anthropomorphic technologies to directly address and ameliorate loneliness. Therefore, I suggest a quantitative research approach, which would empirically test the correlation between the two; thus, testing whether the use of anthropomorphic technologies can alleviate loneliness. As there is sufficient evidence to prove that there could be a correlation between the two, which would impact loneliness policies, and how we are going about handling the issue.

Second of all, I recognize that my thesis may be susceptible to generalizations. I considered a global phenomenon, the issue of loneliness, and suggested one way in which it could be addressed. Since culture played a major role in the reception towards the use

of technology to ameliorate loneliness, I think that a more thorough cross-cultural analysis would be beneficial. What needs to be considered more in-depth is why certain cultures, like Japan, would be more likely to use anthropomorphic technologies than Western countries, such as Canada or the US. A cross-cultural analysis of the use of these technologies would be beneficial in drawing conclusions about why some cultures are receptive to these technologies and why others are not, and how to fix that. I also think this kind of research would be helpful in deducing who is using these technologies and why. As seen in the review of loneliness theories, there are many causes for loneliness, such as culture but also age. This correlates with who is using technology, as that could also be dependent on culture, age, and socio-economic factors. Thus, a more ethnographic research approach would be beneficial. This is important to consider since our use of technology is only increasing, and so it is in our best interest to consider ways to better integrate these technologies in society, and not isolate those that do use it.

Third of all, in my discussion section, I refer to the idea that one's interaction with these anthropomorphic technologies can overtime condition one's behaviour. This is an area that is limited mostly to the use of video games, and how it could condition violent and aggressive behaviour. More information is needed on whether or not this issue of behaviour conditioning applies to these new interactive technologies being used, as this would affect their use.

Lastly, the idea of the non-human was a constant theme throughout this study. At the end of the non-human genealogy, I raised the topic of the Cyborg. This should be researched further as it sheds light on the possibility of changing our understanding of the human and non-human relationship. As seen in the discussion section there are many

social and ethical issues surrounding our treatment of these technologies, which I think stems from our inability to appreciate the interactions we have with them. Humans tend to be able to interact better with non-human entities by humanizing them; but this has issues in of itself, which is why we need new vocabulary such as the Cyborg.

Policy

In terms of policy, there are three policies that need to be implemented. First, there should be regulations on how these technologies are marketed. Currently, the marketing especially for sex robots is aggressive and promotes negative, questionable behavior. This coincides with the second policy recommendation, that the treatment of the non-human and the behavior in simulated worlds should be regulated. As seen in the ethical implications, many of these technologies are being marketed to attract males to unleash their innermost fantasies. Although these policies may affect the sales, arguably, as a society we should always enforce basic human rights, and to set good examples that condition humans to act in a safe way. However, I do think that before adopting these policies, more research needs to be done concerning the idea of how human behaviour can be conditioned. Since, by regulating the use of these technologies, it can allow for certain behaviours to be criminalized, which is substantial.

The third policy would be the implementation of loneliness policies that encourage the use of anthropomorphic technologies in order to normalize their use. Despite there being a need for more research to prove the correlation between lower loneliness rates and the use of anthropomorphic technologies, arguably our views of these technologies

will not change, and thus will not be used unless we accept these technologies, and their possibility of ameliorating loneliness.

References

- Abyss Creations. 2018. "Real Doll" Retrieved March 1 2019 (<https://www.realdoll.com/news/>).
- Anzalone, Salvator M., Sofiane Boucenna, Serena Ivaldi, and Mohamed Chetouani. 2015. "Evaluating the Engagement with Social Robots." *International Journal of Social Robotics* 7: 465-478. doi: 10.1007/s12369-015-0287-7.
- Alberti, Fay Bound. 2018. "This 'Modern Epidemic': Loneliness as an Emotion Cluster and a Neglected Subject in the History of Emotions" *Emotion Review* 10 (3): 242- 254.
- Baynes, Chris. 2018. "Loneliness commission established by murdered MP Jo Cox is wound up." *The Independent*, April 10. (<https://www.independent.co.uk/news/uk/politics/jo-cox-loneliness-commission-wound-down-rachel-reeves-isolation-foundation-a8298761.html>)
- Blackpool, Gjøvik, and Tokyo. 2018. "Loneliness is a Serious Public-Health Problem" *The Economist*, September 1. (<https://www.economist.com/international/2018/09/01/loneliness-is-a-serious-public-health-problem>)
- Blair, Olivia. 2017. "Virtual Reality Pornography could raise issues about consent, researchers warn" *The Independent*, May 19. (<https://www.independent.co.uk/life-style/love-sex/porn-virtual-reality-pornography-consent-issues-reality-fantasy-tech-a7744536.html>)
- Boersma, Kees. 2013. "Liminal Surveillance: An Ethnographic Control Room Study During a Local Event." *Surveillance and Society* 11(1/2): 106-120.
- Bourne, Sue. 2016. *The Age of Loneliness*. [Producer] Wellpark Productions.
- Bouwman, Tamara E., Marja J. Aartsen, Theo G. van Tillburg and Nan L. Stevens. 2017. "Does Stimulating Various Coping Strategies Alleviate Loneliness? Results from an Online Friendship Enrichment Program." *Journal of Social and Personal Relationships* 34(6): 793-811. doi: 10.1177/0265407516659158
- Cacioppo, John T., Nicholas A. Christakis, and James H. Fowler. 2009. "Alone in the Crowd: The Structure and Spread of Loneliness in a Large Social Network." *Journal of Personality and Social Psychology* 97 (6): 977-991. doi: 10.1037/a0016076.
- Christensen, Gerd. 2016. "Genealogy and Educational Research." *International Journal of Qualitative Studies in Education* 29 (6): 763-776.
- Cox, David. 2018. "Are Child Sex Robots Coming Our Way?" *NBC News*, April 1. (<https://www.euronews.com/2018/01/04/would-child-sex-robots-stop-pedophilia-or-promote-it-ncna834576>)

- Cox, Judy. 1998. "An Introduction to Marx's Theory of Alienation." *International Socialism* 2 (79).
- Danaher, John, 2017. "Robotic Rape and Robotic Child Sexual Abuse: Should they be Criminalized?" *Criminal Law and Philosophy* 11: 71-95.
doi: 10.1007/s11572-014-9362-x
- Danaher, John and Neil McArthur. 2017. *Robot Sex: Social and Ethical Implications*. Cambridge, Massachusetts: The MIT Press.
- Daneback, Kristian., Anna Sevckikova, Sven-Axel Mansson and Michael W. Ross. 2013. "Outcomes of Using the Internet for Sexual Purposes: Fulfilment of Sexual Desires." *Sexual Health* 10 (1): 26-31.
- Dassbach, Carl H.A. 1986. "Industrial Robots in the American Automobile Industry." *The Insurgent Sociologist* 13 (4): 53-61.
- Ellens, Harold J. 1997. "A Psychodynamic Hermeneutic of the Fall Story: Genesis 2:25-3:24: Through a Psychological Lens." *Pastoral Psychology* 45(3): 221-236.
- Erlich, Shmuel H. 1998. "On Loneliness, Narcissism, and Intimacy." *The American Journal of Psychoanalysis* 58 (2): 135-162.
- EURON Robotics Atelier. 2006. "Roboethics Roadmap."
- Farahmandian, Hamid and Shima Ehsaninia. 2012. "The Role of Nature in Susanna Moodie's Roughing it in the Bush." *Language in India* 12 (9): 150-162.
- Faustino, Maria Joao. 2018. "Rebooting an Old Script by New Means: Teledildonics – The Technological Return to the 'Coital Imperative.'" *Sexuality & Culture* 22: 243-257.
- Feng, Wenting. 2016. "When Lonely People Encounter Anthropomorphic Products." *Social Behavior and Personality* 44 (10): 1649-1660.
- Ferreira, Antonio J. 1962. "Loneliness and Psychopathology." *Journal of Psychoanalysis* 22 (2): 201-207.
- Finkel, Eli J., Paul W. Eastwick, Benjamin R. Karney, Harry T. Reis and Susan Sprecher. 2012. "Online Dating: A Critical Analysis from the Perspective of Psychological Science." *Psychological Science in the Public Interest* 13 (1): 3-66.
- Foster, Malcolm. 2018. "Robots Making Inroads in Japan's Elder Care Facilities, but costs still high" *The Japan Times*. March 30.
(https://www.japantimes.co.jp/news/2018/03/30/national/robots-making-inroads-japans-elder-care-facilities-costs-still-high/#.XKIyNC0ZO_t)

- Freud, Sigmund. 1919. *The Uncanny*.
- Galloway, Chris and Lukasz Swiatek. 2018. "Public Relations and Artificial Intelligence: It's not (just) about Robots." *Public Relations Review* 44: 734-740.
- Garland, David. 2014. "What is a 'history of the present?' On Foucault's genealogies and their critical preconditions." *Punishment and Society* 16 (4): 365-384.
doi: 10.1177/1462474514541711.
- Gilbert, Melody. 2018. *Silicone Soul*.
- Harris, T. 2015. "Grounded Theory" *Nursing Standard* 29 (35): 32-39.
- Hawley, Louise C and John T Cacioppo. 2010. "Loneliness Matters: A Theoretical and Empirical Review of Consequence and Mechanisms." *The Society of Behavioral Medicine* 40: 218-227. doi: 10.1007/s12160-010-9210-8
- Herakleidon Museum. 2019. "Exhibitions." Retrieved February 1 2019.
(<http://herakleidon-art.gr/en-us/>)
- Holmes, J. 2012 "Attachment Theory." Pp 61-124 in *John Bowlby and Attachment Theory* Taylor & Francis Group. Retrieved from: <http://ebookcentral.proquest.com>
- Honda, American Motors. 2019. "Asimo: The World's Most Advanced Humanoid Robot." Retrieved February 7, 2019 (<http://asimo.honda.com>)
- Honour, Hugh. [1979] 2018. *Romanticism*. Routledge. Reprint, New York: Taylor and Francis.
- Hoorn, John F. 2018. "From Lonely to Resilient Through Humanoid Robots: Building a New Framework of Resilience." *Journal of Robotics* 1-17.
- Hsieh, Hsiu-Fang and Sarah E. Shannon. 2005. "Three Approaches to Qualitative Content Analysis." *Qualitative Health Research* 15 (9): 1277-1288.
doi: 10.1177/1049732305276687.
- Hyman, Wendy Beth. 2011. *The Automaton in English Renaissance Literature*. Surrey, England: Ashgate Publishing Limited.
- Hyyto, Limited. 2019. "Lovesense: Bluetooth Sex Toys for every bedroom!" Retrieved March 5, 2019 (https://www.lovesense.com/?utm_source=google%utm_medium=cpc&utm_campaign=lovesense&gclid=EAIaIQobChMIv9j6Gv4QIVwZJbCh1WdAS-EAAYASAAEgLxt_D_BwE).
- Iavazzo, Christos., Xanthi-Ekaterini D. Gkegke, Paraskevi-Evangelina Iavazzo and Ioannis D. Gkegkes. 2014. "Evolution of Robots Throughout History from Hephaestus to Da Vinci Robot." *Acta Med-Hist Adriat* 12 (2): 247-258.

- Jones, Raya A. 2017. "What Makes a Robot 'Social'?" *Social Studies of Science* 47 (4): 556-579. doi: 10.1177/0306312717704722
- Kakoudaki, Despina. 2014. *Anatomy of a Robot*. New Jersey, NJ: Rutgers University Press.
- Kamide, Hiroko and Tatsuo Arai. 2017. "Perceived Comfortableness of Anthropomorphized Robots in U.S and Japan." *International Journal of Social Robotics* 9: 537-543. doi: 10.1007/s12359-017-0409-8
- Killeen, Colin. 1998. "Loneliness: an Epidemic in Modern Society." *Journal of Advanced Nursing* 28(4): 762-770.
- Kim, Jeong-Hyun., Sang Sub Choi, Moon Sung Rhee, Sun Bum Kim, Ji Sook Joung, and Eun Hye Kim. 2012. "Effect of Sex Offenders Treatment Program on Cognitive and Emotional Characteristics of Mentally Ill Sex Offenders." *Journal of Forensic Sciences* 57 (6): 1608-1613. doi: 10.1111/j.1556-4029.2012.02222.x
- King, Richard H. 2012. "Hannah Arendt and American Loneliness." *Past, Present, Future* 50: 36-40. doi: 10.1007/s12115-012-9616-y
- Kiron, David and Gregory Unruh. 2018. "Even if AI Can Cure Loneliness – Should It?" *MIT Sloan Management Review: Innovation*.
- Kiroo. 2019. "Kiroo Products" Retrieved March 3, 2019. (https://www.kiroo.com/?sscid=31k3_n23mj)
- Kline, Jim. 2016. "The Oldest Story, the Oldest Fear, the Oldest Fool." *Jung Journal: Culture & Psyche* 10 (2): 24-36. doi: 10.1080/19342039.2016.1157411.
- Koopman, Colin and Tomas Matza. 2013. "Putting Foucault to Work: Analytic and Concept in Foucaultian Inquiry." *Critical Inquiry* 39: 817-840.
- Koch, Philip. 1997. *Solitude: A Philosopher Encounter*. Chicago, IL: Open Court Publishing.
- Latour, Bruno. 2005. *Reassembling the Social: An Introduction To Actor-Network Theory*. New York: Oxford University Press.
- Lee, Kwan Min., Younbo Jung, Jaywoo Kim and Sang Ryong Kim. 2006. "Are Physically Embodied Social Agents better than Disembodied Social Agents?: The Effects of Physical Embodiment, Tactile Interaction, and People's Loneliness in Human-Robot Interaction." *International Journal of Human-Computer Studies* 64: 962-973. doi: 10.1016/j.ijhcs.2006.05.002
- Levy, David. 2009. "The Ethical Treatment of Artificially Conscious Robots." *International Journal of the Social Robot* 1: 209-216. doi: 10.1007/s12369-009-0022-6.

- Levy, David. 2007. *Love and Sex with Robots*. New York, NY: Harper Collins Publishers.
- Liu, Tingting. 2019. "Video Games as Dating Platforms: Exploring Digital Intimacies through a Chinese Online Dancing Video Game." *Television and New Media* 20 (1): 36-55. doi: 10.1177/1527476417736614.
- McGlynn, Sean A., Shawn Kemple, Tracey L. Mitzner, Chih-Hung Aaron King and Wendy A. Rogers. 2017. "Understanding the Potential for PARO for Healthy Older Adults." *International Journal of Human-Computer Studies* 33 (47): 33-47.
- Mijuskovic, Ben. 1985. *Loneliness*. New York City, NY: Associated Faculty Press, Inc.
- Mijuskovic, Ben. 2008. "Loneliness and Human Nature." *Psychological Perspectives* 12 (1): 69-77. doi: 10.1080/00332928108408679
- Mijuskovic, Ben. 2012. *Loneliness in Philosophy, Psychology, and Literature*. Bloomington, IN: iUniverse
- Mori, Masahiro. 2012. "The Uncanny Valley." *IEEE Robotics and Automation Magazine*. Translated by Karl F. MacDorman and Norri Kageki: 98-100.
- Morsünbül, Ümit. 2018. "Attachment and Sex with Robots: An Assessment from Mental Health." *Current Approaches in Psychiatry* 10 (4): 417-429. doi: 10.18863/pgy.363669.
- Navaneelan, Tanya. 2010. Suicide Rates: An Overview, Statistics Canada. (<https://www150.statcan.gc.ca/n1/pub/82-624-x/2012001/article/11696-eng.htm>)
- Nimmon, Richard. 2011. "Actor-Network Theory and Methodology: Social Research in a More-Than-Human World" *Methodological Innovations Online* 6 (3): 108-119.
- Nocks, Lisa. 2019. "A Brief History of Robotics since 1950" *Science and Its Times: Understanding the Social Significance of Scientific Discovery*. Retrieved April 1. (<https://www.encyclopedia.com/science/encyclopedias-almanacs-transcripts-and-maps/brief-history-robotics-1950>)
- PARO Robots. 2014. "PARO Therapeutic Robot." Retrieved February 26, 2019 (<http://www.parorobots.com/index.asp>).
- Putnam, Robert. 1995. "Bowling Alone: America's Declining Social Capital" *Journal of Democracy* 6 (1).
- Reed, T.V. 2014. *Digitized Lives: Culture, Power and Social Change in the Internet Era*. New York, NY: Routledge Taylor & Francis Group.

- Richardson, Kathleen. 2016. "Technological Animism: The Uncanny Personhood of Humanoid Machines." *Social Analysis* 60 (1): 110-128. doi: 10.3167/sa.2016.600108.
- Riesman, David. 1950. *The Lonely Crowd*. London, England: Oxford University Press.
- Robinson, Matt. 2018. "Vancouver's First Sex Doll Brothel Could be Opening Soon." *The Vancouver Sun*, September 26.
- Rokach, Ami. 2000. "Loneliness and the Life Cycle." *Psychological Reports* 86: 629-642.
- Rokach, Ami. 1988. "The Relation of Cultural Background to the Causes of Loneliness." *Journal of Social and Clinical Psychology* 17 (1): 75-88.
- Russell, Dan., Letitia Anne Peplau and Mary Lund Ferguson. 1978. "Developing a Measure of Loneliness." *Journal of Personality Assessment* 42 (3): 290-294.
- Russell, Dan., Letitia Anne Peplau and Carolyn E. Cutrona. 1980. "The Revised UCLA Loneliness Scale: Concurrent and Discriminant Validity Evidence." *Journal of Personality and Social Psychology* 39 (3): 472-480.
- Schulenberg, Jennifer L. 2016. *The Dynamics of Criminological Research*. Toronto, ON: Oxford University Press.
- Schumaker, John F., John D. Shea, Melissa M. Monfries and Gary Groth-Marnat. 1993. "Loneliness and Life Satisfaction in Japan and Australia." *Journal of Psychology* 127 (1): 65-71.
- Schwartz, Oscar. 2018. "Love in the Time of AI: Meet the People Falling for Scripted Robots." *The Guardian*. September 26. (<https://www.theguardian.com/technology/2018/sep/26/mystic-messenger-dating-simulations-sims-digital-intimacy>)
- Shaviro, Steven. 2011. "The Universe of Things." *Theory and Event* 14 (3): 476-503
- Shaviro, Steven. 2016. *Discognition*. New York, NY: Random House, Inc.
- Shields, Rob. 2003. *The Virtual*. New York, NY: Routledge Taylor & Francis Group
- Shiomi, Masahiro, Kodai Shatani, Takashi Minato, and Hiroshi Ishiguro. 2018. "How Should a Robot React Before People's Touch?: Modeling a Pre-Touch Reaction Distance for a Robot's Face." *IEEE Robotics and Automaton Letters* 3 (4): 3773-3780.
- Silva, Daniel. 2018. "Dating apps use artificial intelligence to help search for love." *Phys.Org*. November 8. (<https://phys.org/news/2018-11-dating-apps-artificial-intelligence.html>)

- Sisenwein, Robert Julian. 1964. "Loneliness and the Individual as Viewed by Himself and Others." PH.D. dissertation, Department of Education, Columbia University, New York: NY.
- Snell, K.D.M. 2017. "The Rise of Living Alone and Loneliness in History." *Social History* 42 (1): 2-28.
- Specktor, Brandon. 2018. "Meet Erica, Japan's Next Robot News Anchor" Live Science, January 30. (<https://www.livescience.com/61575-erica-robot-replace-japanese-news-anchor.html>)
- Stevens, Laura. 2014. "Alienation in the Information Age: Wafaa Bilal's Domestic Tension." *Australian Drama Studies* 65: 77-95.
- Stivers, Richard. 2004. *Shades of Loneliness: Pathologies of a Technological Society*. Lanham, MD: Rowman and Littlefield Publishers, Inc.
- Sturm, Thomas and Falk Wunderlich. 2010. "Kant and the Scientific Study of Consciousness." *History of the Human Sciences* 23 (3): 48-71. doi: 10.1177/09626695110363355.
- Sullins, John P. 2012. "Robots, Love, and Sex: The Ethics of Building a Love Machine." *IEEE Transactions on Affective Computing* 3(4): 398-409.
- Swader, Christopher S. 2019. "Loneliness in Europe: Personal and Societal Individualism-Collectivism and their Connection to Social Isolation." *Social Forces* 97 (3): 1307-1336. doi: 10.1093/sf/soy088.
- Taniguchi, Emiko. 2018. "Loneliness and Inducing Incremental Theories of Social Interactions to Produce Adaptive Change." *Personal Relationships* 25: 394-410. doi: 10.1111/pere.12250.
- Van Heerden, Esther. 2011. "The Social and Spatial Construction of Two South African Arts _____ Festivals as Liminal Events." *South African Theatre Journal* 25 (1): 54-71.
- Van Staden, Werdie and Kobus Coetzee. 2010. "Conceptual Relations Between Loneliness and Culture." *Current Opinion in Psychiatry* 23: 524-529. doi: 10.1097/YCO.Ob013e32833f2ff9
- Vice. 2014. "The Digital Love Industry." *Love Industries* Season 1 Episode 2. https://www.youtube.com/watch?v=FBRSR_LG1OE
- Vice. 2014. "The Japanese Love Industry." *Love Industries* Season 1 Episode 7. https://video.vice.com/en_ca/video/the-japanese-love-industry/563a6b1b168d315d6407932a
- Vice. 2016. "Making the World's First Male Sex Doll." *Slutever*.

https://www.youtube.com/watch?v=GKFHZuCvvS4&has_verified=1

- Warminski Andrzej. 1995. "Hegel/Marx: Consciousness and Life." *Yale French Studies* 88: 118-141. Retrieved: January 27 2019.
- Weik, Elke. 2010. "Bourdieu and Leibniz: Mediated Dualism." *The Sociological Review* 58: (3).
- Wiederhold, Brenda K. 2015. "VR Online Dating: The New Safe Sex." *Cyberpsychology, Behavior, and Social Networking* 19 (5): 297-298. doi: 10.1089/cyber.2016.29036.bkw
- Worsley, Amelia. 2015. "Ophelia's Loneliness." *ELH* 82 (2): 521-551.
doi: <https://doi.org/10.1353/elh.2015.0022>
- Wu, Ya-Huei, Christine Fassert, and Anne-Sophie Rigaud. 2012. "Designing Robots for the Elderly: Appearance Issue and Beyond." *Archives of Gerontology and Geriatrics* 54: 121-126. doi: 10.1016/j.archger.2011.02.003.
- Yang, Keming and Christina Victor. 2011. "Age and Loneliness in 25 European Nations." *Ageing and Society* 31: 1368-1388. doi: 10.1017/S0144686X1000139X
- Yair, Gad and Michaela Soyer. 2008. "The Ghost is Back, Again." *Journal of Classical Sociology* 8 (3): 323-343. doi: 10.1177/1468795X08092382.

Appendix

Source	Titles
Documentary	<ul style="list-style-type: none">- <i>The Age of Loneliness</i>- <i>Silicone Soul</i>- <i>Japanese Love Industry</i>- <i>The Digital Love Industry</i>- <i>Making the World's First Male Sex Doll</i>
Website	<ul style="list-style-type: none">- Kiroo- LoveSense- Honda- Abyss Creations- EURON- PARO Robotics