Implications of Transhumanist Future Visions on Present-Day Social and Technological Innovation

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Abstract

Transhumanism is a philosophical worldview, which has turned into a cultural movement, which is primarily concerned with the acceleration of human evolution beyond its current limitations through scientific and technological means (Kurzweil, 2005; More, 2013). Transhumanist future visions range from extensive body modifications, such as enhanced cognition, to a world dramatically changed by artificially intelligent machines (Fuller et al., 2014; Kurzweil, 2005). Transhumanists can be considered those who take seriously the subjects and endeavors of radical-life extension, post-humanity, and the development of human and superhuman level artificial intelligence.

Rather than see transhumanist future visions are extreme or dangerous, I take these visions seriously by examining their impacts on technological innovation. Transhumanist visions look optimistically towards a distant future and offer counter discourses to contemporary and popular dystopian future narratives. Although transhumanist narratives are often criticized for being overly speculative, these future visions challenge fundamental values and areas of need in of our current societies.

The future is a wicked problem, as argued by Tutton (2017), in that there is often confusing and competing information, motives and unknown ramifications about the future. The future can never be known for certain, and yet our society has never been more preoccupied with it. This social preoccupation occurs because there are increasing fears about our loss of control over what the future may hold. According to Wood (2021: 1), “Transhumanism is a vision of the future: a vision of what’s possible, what’s desirable and how it can be brought into reality.” While transhumanist future visions are criticized for being overly speculative, these future visions still have real world impacts in the present. Therefore, it is important to study futurist expectations, like transhumanist visions, because they have real social and material implications, such as the ways in which they shape research and development agendas and priorities as well as research and development funding decisions.

I draw on the theoretical framework of the sociology of expectations (SE) literature which emerged within science and technologies studies (STS) from the mid-to-late 1990s. SE examines the future as an object of inquiry, but rather than making predictions of the future SE focuses on the rhetorical and societal effects of future representations. In order to examine transhumanist

discourses and their impact on research and decision making, I engaged in a study of the transhumanist movement and its influence through in-depth, qualitative interviews. Methodologically, "the future" can be studied through three different lenses: discourses, decisions, and materiality (Selin, 2008). Therefore, these three lenses aided in informing my research objectives, which are three-fold. I interview transhumanists with the objectives of identifying what future expectations underpin transhumanist discourses and future visions. Then examine how transhumanist discourses impact decisions surrounding social and financial investment within transhumanist visions. Finally, I interviewed engineers, scientists, and innovators in order to understand how/if transhumanist visions have an impact on contemporary technological development. I consider the interviews to be framed within a case study, which is best used when research questions as 'why' and 'how,' and when studies focus on contemporary phenomenon within its real-world context (Yin, 2018). I analyze my interview data using grounded theory, which relies on inductive reasoning to analyze social processes and relationships.

In the empirical chapters, I analyze the strategic use of historical narratives as well as technological progress narratives to identify what expectations underpin transhumanist future visions. Then I analyze how decisions about the future are made by addressing how expectations inform decision-making in the present. I argue that transhumanism is a flexible movement that enables diverse transhumanists to mobilize together, while at the same time it engenders fragmentation. Finally, I analyze how the material configurations of transhumanist visions enact a range of different temporalities. Across these analyses, I unpack the social and financial implications of transhumanism for technological innovation.

The main issues at stake in my dissertation are the impacts that speculative visions, like the analyzed transhumanist discourses have on decision making. Future visions and discourses are not neutral but entail social and financial investments in making those visions and discourses come to pass.

Dedication

This dissertation is dedicated to anyone who ever had a question, whose answer, only time would tell.

To those who carve their own path, break the molds and relentlessly show up for themselves.

Just trust …

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Chapter 1: Introduction

"The past has been colonized, the present is fleeting, and the future holds all the mystery of lore." (Selin, 2008, p. 1891)

1.1 Introduction

The Future of Humanities Research Institute (FHI) at Oxford University closed its doors permanently last spring in April 2024. FHI was run by renowned technological philosopher and ethicist as well as transhumanist, Professor Nicholas Bostrom. The Institute opened in 2005 as a multidisciplinary research group contributing to research in areas of big picture questions about humanity and its prospects, according to Anders Sandberg (2024), a colleague of Bostrom's at FHI and fellow transhumanist, who wrote the Final Report upon the Institute's closure. The Future of Humanity Institute as an academic institution was significant because it highlighted the importance and legitimization of the need to grapple philosophically and ethically with large scale problems concerning humanities futures, especially related to technological innovation and risks. Sandberg (2024) described one of the missions of FHI: "one major contribution was in showing that it was even possible to do rigorous research on big picture questions about humanity's future." (para. 2). Sandberg (2024) described that FHI not only made many important research contributions within their field, but also let to the creation of new fields and paradigms.

Citing administrative difficulties within its home faculty of Philosophy at Oxford, FHI was closed on April 16, 2024 (Sandberg, 2024). Interestingly, however, shortly before this time, on January 9, 2023, FHI founder, Professor Nick Bostrom, issued an apology, in an attempt to try to get ahead of a public shaming for a 26-year-old post made on the extropian mailing list. He had

received word that someone was poking around on old posts looking for embarrassing content. The post in question contained extremely harmful racially discriminatory sentiments and language. Whether this post contributed to the lack of funding or 'administrative difficulties' within the Philosophy department at Oxford, FHI's closure came suddenly and shockingly to its associated faculty and those in the broader field. The erasure of this space in early 2024 begs the question of whether the current crisis in education is to blame, or if there is a wider cultural, academic, philosophical or technological narrative regarding the changing of the times and need or lack thereof, for this type of institutional large-scale human and existential research.

While these particular questions focused on the FHI are outside of the scope of this project, this example opens a broader conversation regarding the need or redundancy for academic research on technological futures, human and more than human, within in fields such as philosophy, science and technology studies, and humanities, as well as within STEM fields such as science and engineering.

While the closure of a major philosophical hub surrounding the future of humanity appears to signal its wider redundancy, I argue that the current political upheaval globally, but certainly in the western world, where technological oligarchies like Elon Musk have an exorbitant amount of power, signals now, more than ever, the importance of scholarly work concerning the ethical, social, and political implications of possible futures, or what I examine here as technological future visions.

I set out to examine the implications of technological future visions motivated by my own curiosity and concern over serious political and powerful implications of technological innovation surrounding these visions in the hands of technological oligarchies, like Musk, Thiel, Bezos, Zuckerberg, etc. My previous work has addressed concern over powerful actors and technological

monopolies making important decisions about technological innovation that will effectively design our future and may have wide and unforeseen consequences on the population at large.

Specifically, I set out to examine the implications of future narratives from social and technologically futurist institutes such as the Singularity University and social movement, only to quickly broaden my scope to the wider social and philosophical movement of transhumanism, of which the singularity is one particular brand. As is typical in much social science research, my findings regarding transhumanist values and the implications of their future visions turned out to be much more nuanced, complicated and marginal that I had originally hypothesized.

The speculative technological future visions that I focus on for this project are specifically transhumanist. While transhumanism incorporates a multiplicity of meanings and a diversified area of interests and research there are several key themes, values, and characteristics that give it a cohesive identity. As per transhumanist philosopher Max More (2013a), transhumanism can be understood as a particular form of futurism that is fundamentally a philosophical outlook concerned with the acceleration of human evolution beyond its current limitations through primarily scientific and technological means. According to transhumanist advocate, David Wood (2021), "transhumanism is a vision of the future: a vision of what's possible, what's desirable and how it can be brought into reality." (p. 1). For transhumanists, technology or technological innovation is seen as the platform through which to radically amplify or enhance human capabilities across a wide variety of domains. For example, transhumanist future visions range from extensive body modifications, such as enhanced cognition, to a world dramatically changed by artificially intelligent machines, along with longevity projects such as cryonics, genetic engineering, and nanotechnology (e.g., Fuller, 2011; Fuller et al., 2014; Hughes, 2010; Kurzweil, 2024; More & Vita-More, 2013; Sandberg, 2013; Wood, 2022). Transhumanist visions evoke the

responsible application of current and emerging technologies to enhance human cognition and sensory capacities as well as to slow, reverse or eliminate the aging process in humans and beyond (Bostrom, 2005; More, 2013a). Ostberg (2022) argues that these visions suggest that humans with augmented capabilities will transcend humanity, becoming an enhanced species and therefore become 'posthuman.'

While transhumanist future visions vary greatly, generally speaking these visions are grandiose, in that they conceptualize radical forms of technological embodiment, such as enhanced cognition, or even disembodiment, such as mind uploading, which eliminates the need for a body altogether. While transhumanist future visions may be categorized as dangerous or extreme, this project takes these visions seriously by examining the role that these speculative visions play in present day decision making, such as social and financial investments. Therefore, using the theoretical framework of the sociology of expectations, this project aims not to make predictions of the future but to examine what types of social impacts technological future visions play in present, everyday decisions. The aim of this project is to look beyond the grandness of utopian technological dreams in order to understand the motivations, impacts, performance, collaboration, and materiality of technological future visions. I aim to examine not the extravagant, but the mundane everyday practices of these visions and transhumanist narratives.

While transhumanism has a rich history and solidified social movement(s) surrounding future visions of human and technological enhancement, 'transhumanism' or 'transhumanist' are highly contested terms. MacFarlane (2020) argues that for some, transhumanism evokes radical visions of the future, particular narratives, and new notions of politics, culture and identities, while to others the term/label of transhumanism is stigmatizing. Like Lilley (2013), I use the label 'transhumanist' as a catchall for a variety of notable figures, the social movements, and the ideas,

principles and philosophies surrounding them. I recognise that while some accept this descriptor, not all do. I have done my best to respect the titles and labels that my interviewees described for themselves but will undoubtedly categorize some actors under transhumanists who do not qualify themselves that way. According to Bohan (2018), transhumanists can be considered those who take seriously the subjects and endeavors of radical-life extension, post-humanity, and the development of human and superhuman level artificial intelligence. In this project, I will use the term 'transhumanist' as a term for those who advocate for technological human enhancement.

This project then aims to understand the impact of speculative future visions as examined through transhumanism and its contradictions. In this project I examine the core values and principles of transhumanism in order to understand how these future discourses proliferate beyond transhumanist social networks, aka, into broader cultural narratives. I then examine the impacts transhumanist future visions have on decision making about the future and how future visions become configured materially.

The main issue at stake is that futurist expectations, like transhumanist visions, have real social and material implications, such as the ways in which they shape research and development agendas and priorities as well as research and development funding decisions. While transhumanist future visions are criticized for being overly speculative, these future visions still have real world impacts in the present. Therefore, this research project aims to examine the implications of transhumanist future visions as framed by the sociology of expectations theoretical framework using a qualitative case study approach.

This project relies on the method of case study in order to gather data through virtual semi-structured qualitative interviewing. Because transhumanism is a contemporary phenomenon with an active global membership, I gathered data not only primarily through transhumanist actors

themselves, but also through secondary transhumanist literature as well as non-transhumanist secondary literature, such as critical scholarship on transhumanism. I therefore grapple with the fuzziness within the boundaries associated with transhumanist actors within this project. Not only does the term transhumanism have a multiplicity of meanings and interpretations, but the actors themselves do not always occupy clear boundaries as solely participants within this project, because many also occupy theoretical, intellectual and institutional expertise. When attempting to separate the participant data from key transhumanist texts/literature, the fuzziness of these boundaries became apparent.

In this sense, there are three categories of literature that I draw on, academic literature written by non-transhumanist actors, can generally be through of as critical, popular transhumanist literature, that reflects the principles of this worldview and understood to be written or oral, but produced by transhumanists themselves, and finally a blend of the two, as there are many transhumanist actors who occupy research and teaching positions within academic institutions. Therefore, there is an analytical and theoretical fuzziness, as transhumanist produced literature occupies everyday literature, as well as academic discourses and practices within both academic and research institutions. Having identified the fuzzy nature of boundaries between theoretical and analytical sources/data, I will do my best to be explicit on the origin of the data and sources throughout this project.

This perspective is important and generative within this research project, as it allows to not only follow transhumanist values and principles through both primary and secondary sources, aka, within transhumanists own words, but also allows me to follow these claims in order to analyze the implications of transhumanist future visons, through which their core values and principles are

embedded. Relying on transhumanist primary data to follow narrative claims of their values and histories allows for a deep understanding of the narratives and their values.

1.2 Research Problems

This research project is timely and relevant because our technological futures are at stake. While the future cannot be known for certain it is a worthwhile pursuit to study our social expectations of the future, because our expectations inform the decisions and actions that we make in the present that bring about particular futures, making some visions successful, while others are not.

The future is a wicked problem, as argued by Tutton (2017), in that there is often confusing and competing information, motives and unknown ramifications about the future. The future can never be known for certain, and yet our society has never been more preoccupied with it. Brown et al. (2000), argue that this social preoccupation occurs because there are increasing fears about our loss of control over what the future may hold. While seemingly self-evident, within contemporary society, the future is highly uncertain (Adam & Groves, 2007; Alvial-Palavicino, 2016). However, Alvial-Palavicino (2016) argues that "it is a profoundly contemporary phenomenon to perceive the future as empty, open-ended and unpredictable. Despite this unpredictability, there is an increasing need to act in relation to the future, particularly to prevent potential risk or to profit from big promises." (p. 136). Therefore, the uncertainty of the future implies a need to take action towards it. Alvial-Palavicino (2016) argues "an uncertain future is made "actionable" by a set of societal arrangements, attitudes and interventions that can be legitimized in the name of what is yet to come." (p. 136). Or in other words, futures become 'actionable' through social expectations surrounding concerns for the future.

This project is therefore situated within the theoretical approach in STS called the sociology

of expectations, or SE, which situates "the future" as an analytical object, shifting the analytical gaze from looking into the future to looking at the future as a sociological phenomenon in its own right (e.g., Berkhout, 2006; Borup et al., 2006; Brown et al., 2000; Konrad et al., 2016; Selin, 2008; van Lente, 2012).

This project addresses a research gap in this area, as MacFarlane (2020) argues "in the last decade, scientific and technical advances have led to an unprecedented questioning of dominant doctrines concerning the human condition, yet fledgling social formations organised around this prospective technological re-negotiation of humanity remain under-researched." (p. 1). There is a lack of adequate exploration of the role of visions related to innovative technology, and their consequences, as argued by Vicsek (2021). Scholarship has yet to see the sociology of expectations theoretical framework and future visions surrounding innovative technological exploration come together. Sociology of expectations research has primarily focused on Europe and to a lesser degree the United States. A broader international perspective is needed and has only begun to emerge in recent years (Konrad et al., 2016). This project aims to add the theoretical and conceptual frameworks of technological future representations as representative of expectations.

Future expectations should be thought of as particular representations of future visions, however, there is often a disparity between representations of innovative technologies like what artificial intelligence could do, and what it currently can do. According to Dandurand et al. (2020) within representations of AI, "the distinction between what AI *could accomplish in the future* and how technologies that fall under the umbrella of AI *currently perform* is often obfuscated… [some] successes do exist; however, representations of future applications of AI are too often presented in public discourse as inevitable outcomes of technological development rather than challenging processes that may fail to meet initial expectations." (p. 592). Dandurand et al. (2020), argue that

there is a conflation between expectations and realization of these expectations, describing a particularly determinist dominant expectation surrounding technological development. This conflation between future technological expectations their material configurations is an important foundation for this project. Transhumanist future visions are grandiose and often spoken about with deterministic tendencies. This project aims to bridge the gap between future expectations and their configured manifestation, looking at the mundane processes and expressions of transhumanist future visions.

While transhumanist future visions are often criticized for being overly speculative, these visions offer hopeful and positive versions of what may be possible for humans in the future (Wood, 2021). These visions contrast with overwhelmingly dominant dystopian future narratives that fill our news and news feeds. Importantly, even hopeful transhumanist future visions still have real world impacts in the present. Therefore, it is important to study futurist expectations, like transhumanist visions, in order to understand the impacts they have, such as the ways in which they shape research and development agendas and priorities as well as research and development funding decisions.

While this project set out to examine the implications of transhumanist future visions on technological development, my findings point to the ambiguities within transhumanism that keep this social movement and philosophical worldview within its marginal societal position. Because transhumanist principles and social movements have a multiplicity of meanings and values, their future visions are difficult to enact, in that both social and financial investments are difficult to garner and therefore, the implications of transhumanist visions within the innovative technological landscape have been minimal. The main issues at stake in my dissertation is understanding the

implications of a social futurist movement's visions, like the analyzed transhumanist movements discourses.

1.3 Research Objectives

This project examines the implications of transhumanist future visions within the framework of the sociology of expectations in order to understand transhumanism and the broader impactions of their core values. These questions are focused through the three lenses in which futures can be studied: discourses, decisions and materiality (Selin, 2008). Therefore, in this dissertation, I address the following three research questions:

1. *What are the core values and principles within transhumanism that frame their future visions?*

This research question addresses discourses. To address this objective, I set out to examine transhumanist discourses through influential transhumanist institutes like the Singularity University in order to analyse their core principles and values. Upon identifying informants and initiating interviews with key transhumanist actors, I discovered that a broader scope of transhumanism was available and necessary to explore in order to gain a fuller understanding of transhumanist discourses and future expectations. The Singularity movement is only one particular take or fragment of broader transhumanist future visions. Throughout my empirical data collection, I uncovered many other fragments of social movements inspired by transhumanism, such as Mormon Transhumanism, Christian Transhumanism, Solar Punk, Effective Altruism, and political transhumanism such as the US Transhumanist Party.

My aim is to understand transhumanist discourses and their impact on broader social futurist narratives. I argue that while transhumanism has a broad meaning, there are core values and themes that connect these social movements surrounding futurist visions. Based on discourses

provided by transhumanist actors, I analyse these discourses surrounding the following research questions:

What are transhumanist core values and principles?

How do transhumanist discourses proliferate beyond transhumanist social networks?

What do transhumanist future discourses 'do'?

2. *How do future expectations in transhumanism influence present day decisions making about the future?*

In order to address this objective, focused on decisions making, I set out to focus on how social actors (policy makers, funding bodies, research institutes, private businesses) make decisions regarding investments in technological development in order to understand how future expectations in transhumanist discourses influence society. This research question and objective evolved through the data collection phase, as access to these individuals became unfeasible for a project of this scope. I therefore analyzed data collected from both transhumanist and non-transhumanist actors in order to examine how future investment decisions, be it social or financial, become made in the present. The following research questions are addressed:

What visions of the future garner more support and why?

How do discursive practices surrounding transhumanist future visions impact present decisions and investments?

How do transhumanist future visions constitute performative practices?

3. *How does the enrollment of current societal resources come to configure the development of transhumanist future visions?*

To address this objective, focused on materiality, I analyze how technological innovators, engineers and scientists make decisions regarding technological innovation in order to understand

how future expectations in the form of transhumanist visions become configured materially and what implications these materialized technologies have.

How do transhumanist future visions become materially configured?

What impactions do the materialization of future visions create in the present?

The above research questions, which are informed by the sociology of expectations theoretical framework on how to study the future, through discourse, decisions and materiality, frame this study. The case study approach is facilitated by this study examining a current social phenomenon. The theoretical and methodological frameworks as well as the epistemological assumptions inherent in STS, inform what and how I approach research questions within this project, both for the project overall and in regard to informant interviews. This project is not about predicting the future or critiquing transhumanism, but in understanding the implications of future visions, especially within a case with such multiplicity. The driving question of this research project asks: *What is transhumanism and its core values and what types of implications do these speculative future discourses have*?

1.4 Chapter Outline

In this chapter I provide the background and inspiration for this research project. I discuss the research problems leading to the timely relevance of this project as well as the research questions that inform the design of this project. I offer an outline of arguments in the chapters that follow before continuing to detail arguments throughout the following chapters.

In chapter 2, the theoretical framework that informs this project is examined in detail. Theoretically, this project is framed by the sociology of expectations framework, which conceptualizes the future are an analytical object in its own right (Borup et al., 2006; Brown & Michael, 2003; Konrad, 2006; Michael, 2000; Selin, 2008; Tutton, 2017; van Lente, 1993).

Because the impacts of future representations are at the foreground of this project, the sociology of expectations theoretical framework allows me to explore how future visions are socially constructed and socially generative, as well as how future expectations influence technoscientific innovation *and* also how they shape society.

Methodologically, this study is informed by the sociology of expectations as well as the research objectives, which focus on studying representations of the future. Therefore, this study is framed by the way in which futures are analyzed within the sociology of expectations framework. "The future" can be studied through three different lenses: discourses, decisions, and materiality (Selin, 2008). Therefore, these three lenses aid in informing my research objectives, which further inform the 3 analytical chapters (5, 6, and 7) in this project.

Chapter 3 discusses the methods that were used within this study, which focuses on a case study methods, and are also intimately tied to the methodological and theoretical choices as discussed in chapter 2. In this section, I discuss how relevant empirical data was collected as well as how data was thematically coded and analyzed. I discuss the messy nature of studying both future representations as well as a fragmented social group. Research ethics and field adjustments due to the COVID-19 pandemic are also discussed.

Chapter 4 offers a self-history of transhumanism. The scope of this chapter is not an exhaustive history but offers an account of major historical moments as told by transhumanist interviewees as well as within secondary transhumanist literature. I examine the religious historical influences of transhumanism, which include figures like Pierre Teilhard de Chardin and Nikolai Fedorov as well as the contemporary relationship between transhumanism and religion. Then I examine major contemporary moments, such as founding research institutes and social organizations to come out of the transhumanist philosophy.

In chapter 5, I examine transhumanist future visions through interview data with the objectives of identifying core values within transhumanist discourses. This chapter examines historical transhumanist narratives and influences, called proto-transhumanism, which I argue commits the fallacy of anachronism. This chapter also examines contemporary transhumanist discourses, which transhumanist actors described as becoming pervasive within western culture. I examine the tensions and implications of transhumanist visions becoming pervasive, while the term transhumanism has arguably become less popular since its formalization in the early 1990s.

In chapter 6, I examine how transhumanist discourses impact decisions surrounding social and financial investment within transhumanist visions. I analyze how decisions about the future are made by addressing how future expectations inform decision-making in the present. I argue that transhumanism is a flexible movement that enables diverse transhumanists to mobilize together, while at the same time it engenders fragmentation.

In chapter 7, I analyze how transhumanist future visions become materially configured. I analyze interview data from non-transhumanist actors, such as engineers, scientists, and innovators, in order to understand how or if transhumanist visions have an impact on contemporary technological development. Using three specific interview's I tell the stories of the repurposing existing technologies, which I argue is a mundane expression of grandiose transhumanist future visions.

The conclusion chapter summarizes the findings and contributions of this project. This chapter also rearticulates the main arguments throughout the analytical chapters of this project. I pontificate on further research questions and discuss the limitations of this study.

Chapter 2: Theoretical Framework: Sociology of Expectations

2.1 Introduction

In the previous chapter I introduced this research project, including the research objectives and what is at stake. This chapter will examine the theoretical framework employed for this study, the sociology of expectations. This chapter also provides a brief literature review on transhumanist conceptualization of futures as well as an examination of the theoretical concept of social movements in order to understand how transhumanism is framed within this project .

Focusing on science and technology studies (STS) literature regarding emerging technologies, the sociology of expectations (SE) this chapter then provides an important conceptual framework that emphasizes the importance of analysing the role of the future in the present (Birch, 2023; Tutton, 2017). Future expectations are socially constructed and socially generative; that is, SE enables me to explore how future expectations of technoscience influence its development *and* also how they shape society (Borup et al., 2006). The sociology of expectations focuses on how representations of future technologies participate in innovation processes (Dandurand et al., 2020).

The theoretical lens is an important tool in shaping this research project. Creswell (2014) argues that a theoretical lens provides the perspective that shapes the way questions are framed, which questions get asked, as well as informing how data are collected and analysed. The theoretical lens of the sociology of expectations, provides the backbone of this study, informing the types and meanings of question that shape this research project.

In the second part of this chapter the sociology of expectations theoretical framework is discussed by focusing on the key theoretical concepts that relate to future discourses of transhumanism. The section begins with an examination of anticipatory concepts through which

futures can be studied, such as visions, promises, and expectations, where I argue that expectations are the most appropriate theoretical framework for this study. The following section offers a brief history of the sociology of expectations theoretical framework. I then examine the key themes within the sociology of expectations framework that provide the grounds for analysis in the empirical chapters, organized by how they appear within the empirical chapters. This chapter then briefly offers some potential pitfalls of the theoretical framework.

2.2 Future Discourses in Transhumanism

This section offers a brief literature review on the relationship between futures and transhumanism, in other words, examining how the future is treated in transhumanism in order to more thoroughly understand how transhumanist actors think about or understand the future.

As examined throughout this project, the aims of transhumanist visions are multiple and cover many areas and types of human enhancement, such as anti-aging, enhanced cognition and enhanced happiness or quality of life. To reiterate, Tirosh-Samuelson & Hurlbut (2016) define transhumanist goals: "for some, the ultimate aim of human enhancement is to achieve the power to imbue human bodies with superior physical and mental traits, the ability to live longer and happier life and, ultimately, to postpone death indefinitely. Indeed, for some the defeat of death is the ultimate justification for the project of human enhancement (De Grey, 2007)." (p. 7). As argued by Tirosh-Samuelson & Hurlbut (2016), transhumanists look to control the future evolution of humanity through newfound technological innovation, "until now the human species was transformed by evolution, which was a slow, uncontrolled, and unpredictable process, now evolution will be fast, controlled, and directed by humans. This imagined technological future is at once a vision of radical human agency and control engendered through newfound technological powers." (Tirosh-Samuelson & Hurlbut, 2016, p. 7).

Conceptualizing the longer-term goals of transhumanism concerning enhanced cognition and embodies technologies, Tirosh-Samuelson and Hurlbut (2016) describe how technologies are envisioned to work towards these changes.

> Transhumanism anticipates the application of science and technology to the amelioration of the human condition through genetic engineering, robotics, informatics, and nanotechnology. According to transhumanists … augmented transhumans are not going simply to enjoy longer and happier lives devoid of pain and suffering but will make the technology that will render biological humans obsolete. (p. 7).

In this sense, technologies are envisioned to augment and alter human minds, senses and bodies. Further, many transhumanists envision a moment where AI technologies completely surpass human intelligence and capabilities, reaching a technological singularity.

> At some point in this anticipated human–machine merger, the superintelligent machines will become autonomous, decision-making entities that will make their own independent decisions. Futurists who predict this sequence of events (for example, Clark, 1997, 2003; Minsky, 1986, 2006; Moravec, 1988, 1999; Kurzweil, 1999, 2005; Chu, 2014) claim that it will come about after an irreversible turning point— the Singularity— the result of exponential, accelerated process of technological progress. (Tirosh-Samuelson & Hurlbut, 2016, p. 7)

Having defined transhumanist future aims as according to academic non-transhumanists Tirosh-Samuelson and Hurlbut (2016), I reiterate that there is a tension that I identify within this project as a fuzzy boundary between transhumanist actor expertise on transhumanist narrative and values and that of non-transhumanist actors. Transhumanists actors occupy academic, institutional as well as spaces of public commentary, therefore there is a lack of clarity between the insider/outsider boundary. In this section I rely on scholarly secondary literature to sketch a brief and by no means exhaustive review of literature on transhumanism and future discourses.

Throughout this section, and project more widely, it is important to keep in mind that one of the ways in which transhumanists conceptualize and contextualize technological futures is through a long history of the ways in which the human/technology relationship itself has been conceptualized. For example, Tirosh-Samuelson and Hurlbut (2016) argue the boundaries between human and machine have disrupted the material and conceptual boundaries between machine and living being, and that technology itself has become a constitutive force of modernity. While an accounting of the history of technological philosophy is outside the scope of this project and beside the point of this section, it is worth noting that technology has not always been conceptualized as a liberatory or transcendent force, as it is examined here.

Contemporarily scholars like Taillandier et al. (2025) have made sense of transhumanist future visions as a form of world making, because of the future vision's performative and collective qualities. In a case study on effective altruism (EA), which is a philanthropic movement with high-profile techno-entrepreneur advocates, focusing on funding charities on the basis of the number of lives improved per dollar donated, Taillandier et al. (2025), examines EA as a form of technoscientific worldmaking. Taillandier et al. (2025), argue that effective altruism is tied to the idea of moralized obligation towards the future, aka, long-termism, but through a highly capitalistic lens, which sociologists call 'philanthrocapitalism.'

One of the projects that EA's are dedicated to is AI safety, which in itself is a highly moralized valuation of future public welfare, which becomes translated into funding decisions with the EA case. There is a clear link between transhumanism and EA, Taillandier et al. (2025), argue; "The ambition to reshape the long-term future, as a researcher at the Oxford Future of Humanity Institute put it, also makes EA 'the continuation of transhumanism in a much wider sense'." (p. 14-15).

Taillandier et al. (2025) argue that EA is a form of technoscientific worldmaking because of the technological, moral and financial assemblages involved. “EAs fund technological projects with high expected moral value, contest the legitimacy of established knowledge production, and aim to reshape whole fields of expertise. In doing so, they both define global subjects – the global poor, sentient beings or future people – and what counts as global problems.” (p. 3-4). Because of the large-scale problems that EA attempts to reduce, along with major capital, this project quickly becomes a determinist, techno-solutionist project, which Taillandier et al. (2025) argue “assumes a ‘rescue’ idea of philanthropy with deep depoliticizing and paternalist effects.” (p. 3).

In an overlap with transhumanism, Taillandier et al. (2025) argue that EA future visions, which they explicitly qualify as collective and performative, entangle meaning between technoscientific future visions and a positive valuation of future visions, such as desirable social and more order. “Philanthropists, like other economic actors, produce both an idea of the social and the tools to intervene into it.” (Taillandier et al., 2025, p. 4).

Takhar et al. (2022) look at the emancipatory and longevity potential capabilities of nanotechnologies, which they describe as ‘encompassed’ within transhumanism. Regalado (2019) describes transhumanism as “a patchwork of beliefs about how technology will enhance the human condition, maybe radically so.” (Regalado, 2019, p. 72), invoking the fragmented nature that I analyze within transhumanism below. Regalado (2019), as per Takhar et al. (2022), also points a sense of urgency when describing the potential long-termist effects of technologies such as nanotechnology used in the medical field: “there often is a palpable sense of urgency in such ventures because of their potential to extend human life by decades, even centuries, in disease-free and super-able ways (Regalado, 2019).” (Takhar et al., 2022, p. 400).

This sense of urgency or being on the cusp of grandiose technological innovations is one way that future expectations enroll resources. Transhumanist Ray Kurzweil, for instance has been continually predicting an 'intelligence explosion,' of the technological singularity, for decades now. Bostrom (2014) argues that a prediction like an intelligence explosion has been expected since the arrival of computers in the 1940s. "The advent of such machines was often placed some 20 years into the future… its near enough to be attention-grabbing and relevant, yet far enough away to make it easy to imagine significant breakthroughs, might, by then have occurred." (Bostrom, 2014, p. 4).

These types of technological predictions coupled with a sense of urgency, paternalism and capital at stake creates not only counter narratives to popular dystopian future visions but also has the foundational makings of highly politically charged future expectations, as well as having important societal impacts.

Bell and Taillandier (2024) trace a history of transhumanist projects and argue that "analysing transhumanist world-making visions helps to clarify the political ideas underlying current techno-utopian projects and debates about existential risks to humanity." (p. 1). Bell and Taillandier (2024) argue that transhumanism visions are 'extraordinarily ambitious,' or grandiose, as I describe them in this project, in their aim to radically improve human beings through technoscientific intervention. Bell and Taillandier (2024) argue that tracing transhumanist developments as well as understanding their political values in world making aids in the understanding of the politics currently informing technological future visions, especially concerning existential risks regarding humanity.

Urueña (2022) examines the misunderstood concept of anticipation through the lens of both anticipatory governance and responsible innovation, arguing that anticipation has been so heavily

criticized that it is no longer seen as necessary in anticipatory governance or responsible innovation. Urueña (2022) argues that these critiques, which include the misunderstanding that engaging in practices with 'the future' "may reify the future, diminish our ability to see what is happening, and/or reproduce the illusion of control over the future" (p. 271). However, Urueña (2022) stresses that these critiques fail to grasp the heterogeneous characteristics of anticipatory practices and that research on the enactment of anticipatory practices within both anticipatory governance and responsible innovation remains under-developed and fragmented.

Based on the literature examined in this section, transhumanists see themselves as responsible and invested in solving grandiose humanity-scale type problems through technological innovation. These visions are not neutral but politically and culturally motivated. They internalize a sense of urgency because human lives, in terms of a project like longevity and curing aging and therefore diseases, are at stake. Future visions therefore become highly moralized and motivated in an altruistic sense, however, as Taillandier et al. (2025) argued, there is much more at stake than altruistic motivations.

2.3 Transhumanism as a Social Movement

This section briefly examines the theoretical concept of a social movement in order to specify how transhumanism is conceptualized within this project as well as within much of the academic and transhumanist literature itself. Although contested, transhumanism as a 'social movement' is self-defined and taken as self-evident in both transhumanist literature as well as much of the academic literature on transhumanism. I use social movement to describe transhumanist social values and phenomenon in this project but not uncritically. Below, I will discuss the transhumanist history as well as scholarship that use these terms and describe why I feel they continue to be appropriate to address transhumanism contemporarily.

Max More (2013) describes transhumanism as both a social movement and a philosophy in *The Transhumanist Reader*, edited by Max More and Natasha Vita-More, two prominent figures within the transhumanist movement. *The Transhumanist Reader* (2013) was the first comprehensive and authoritative text compilation written by transhumanists. More is credited with the founding of the extropian movement, which is further discussed in chapter 4.

More (21013), a philosopher and futurist, argues about the boldness of describing transhumanism as a 'philosophy.' "To write of 'the' philosophy of transhumanism is a little daring. The growth of transhumanism as a movement and philosophy means that differing perspectives on it have formed." (More, 2013, p. 3). Despite its amorphous meaning, More (2013) argues that there are overlapping themes, values and interests that form a cohesion throughout transhumanism, namely, the three pillars, super-intelligence, super-longevity and super-happiness. Importantly More (2013), citing the Transhumanist FAQ (Various 2003), addresses "the intellectual and cultural movement" (pg. 3) surrounding the desirability and possibility of transhumanist ideals, aka "fundamentally improving the human condition through applied reason, especially by developing and making widely available technologies to eliminate aging and to greatly enhance human intellectual, physical, and psychological capacities." (Transhumanist FAQ, Various 2003 as cited in More, 2013 pg. 3). Transhumanism has been self-claimed as a philosophical outlook, where More (2013) argues; "thus transhumanism is a life philosophy, an intellectual and cultural movement, and an area of study." (pg. 3). I further explore transhumanism as a philosophical outlook in section 4.2.3, where I discuss the contemporary relationship between transhumanism and religion, especially transhumanism's religious contemporary and historical influences.

I highlight the foundational aspect of More and Vita-More's (2013) *The Transhumanist Reader* because of its influence not only amongst transhumanists but within academic texts that

postdate it. For example, More and Vita-More (2013) are cited in the academic volume *Perfecting Human Futures: Transhuman Visions and Technological Imaginations* edited by Hurlbut and Tirosh-Samuelson (2016). Instead of questioning the credence of the social movement surrounding transhumanism Tirosh-Samuelson and Hurlbut (2016) cite More and Vita-More (2013) regarding facts and figures surrounding the movement, giving scholarly validity to transhumanism as a social movement and philosophy. "As a movement, transhumanism is relatively small and membership in the World Transhumanist Organization is only about 5,000 people worldwide and the intellectual coherence of the movement is still subject to ongoing discussion (More & Vita-More, 2013)." (Tirosh-Samuelson & Hurlbut, 2016, p. 9).

Tirosh-Samuelson and Hurlbut (2016) further analyze transhumanism through its self-prescribed frame when they lay out part of their analytical framework: "… [we] develop [a] robust empirical analysis that advances our understanding of transhumanism as a movement, as a philosophical frame, and as a vision of the human future…." (Tirosh-Samuelson & Hurlbut, 2016, p. 12). These scholars analyzing transhumanism through the frames of movement itself, being social as well as philosophical.

Transhumanist historian Bohan (2018) takes transhumanism as a social movement and philosophy as self-evident as well. "[Transhumanism] is often described as a modern philosophy, a social movement and a field of study that focuses heavily on the promise and peril of an affiliated set of technologies and disciplines: nanotechnology, biotechnology, information technology and cognitive science (NBIC)." (Bohan, 2018, p. 11).

MacFarlane (2020) dives deeply into the characteristics of transhumanism as a new social movement in *Transhumanism as a New Social Movement: A Techno-Centered Imagination*. MacFarlane (2020) uses 'New' Social Movement theory (NSMT), which involves a paradigm shift

around World War 2, in moving away from the traditional context of social movements, such as mobilization around financial disenfranchisement, towards issues of personal identity and quality of life. According to MacFarlane (2020), New Social Movement theory replaced earlier paradigms of social movement theoretical frameworks. Twentieth-century social-psychology-based collective behavior models, which viewed social movements as enrolling isolated or desperate individuals in emotion turmoil, such as resources mobilization theory of the 1960's and 70's, supplanted the presumed irrational behavior basis of social movements and instead saw collective behavior as rational in which individuals weigh the positive and negative benefits of participation rationally (MacFarlane, 2020).

Alongside a temporal transition, MacFarlane (2020) argues that widely, the political agendas of social movements have changed from industrial to post-industrial eras and to global as opposed to local scales. "Commentators in the NSMT vein have suggested while classical social movements of the late nineteenth and early twentieth century were close-knit protest groups concerned with class conflict, more recent movements -associated with the latter twentieth century to the present- are far looser networks concerned with addressing forms of political and social conflict (Flynn, 2011)." (p, 26). I argue throughout this project that transhumanism is almost too loose of a social movement as to remain marginal. However, there is no doubt that transhumanist goals entwine both social and political agendas.

MacFarlane (2020) argues that "according to the NSMT model, now one of the most dominant approaches towards contemporary social movement research used today, a so-called new social movement can be analysed according to the following criteria: the point of view of its actors, the relationship between such actors and the wider culture, and the social movements framework for action (Wieviorka 2005)." (p. 27). Although this project has not strictly adopted the new social

movement theory, I use social movement to describe the social phenomenon surrounding transhumanist values and ideals. In this sense, I have represented views of transhumanist actors by giving space for their own representations of themselves and their views, especially in chapter 4, where a self-history is represented. Throughout my analytical chapters, I have analyzed in many facets, the relationship between actors and wider cultural views, in fact one of the motivations for this project, is to discover how transhumanist views impact wider cultural views. Therefore, an examination of the social movements framework for action was also necessary, which was demonstrated through actor's activism as well as wider social movement goals and values. Transhumanism fits the new social movement criteria in its political and social agenda as well.

Regarding the creation of social movements, MacFarlane (2020) argues that social movement framing theory proposes that they are created through the use of frames. "In this respect, the theory attempts to understand the ways social movement organizations and social movement actors use *meaning* to frame ideas and events." (MacFarlane, 2020, p. 27-28). Frame analysis is attributed to Sociologist Erving Goffman (1974) and informed by social constructivism. MacFarlane (2020) argues, "borrowing from Goffman's work, framing theorists suggest the act of framing-that is, inclusion of specific factors/aspects within a given perspective at the inevitable exclusion of others-helps people interpret the world according to their social position and previous experiences." (p. 28).

This type of framing, then, allows social movements to take up issues that appeal to other potential participants. According to MacFarlane (2020), social movements aim to position social conditions as social problems, which enables the movement to work towards a solution. In this sense, transhumanism meets what Benford and Snow (2000) call 'motivational framing' which "provides a 'call to arms' or rationale for engaging in ameliorative collective action, including the

construction of appropriate vocabularies of motive" (p. 617 as cited in MacFarlane, 2020, pg. 28). This type of motivational framing is concerned with mobilizing actions by creating a sense of agency in participants and potential participants of the movement, as argued by MacFarlane (2020).

Motivational framing analysis of social movements provides similar calls to action to future expectations within the sociology of expectations, in eliciting a sense of responsibility and agency in individuals and potential group members, revolving around wider social and political issues. The sociology of expectations is the analytical framework for this project and will be examined below.

2.4 Key Theoretical Anticipatory Concepts

Rhetoric and representations of futures are entangled as both the analytical framework as well as the empirical evidence throughout this dissertation. Future expectations as the analytical concept, however, also empirically show up in the world. This project focuses on analyzing rhetorics as expectations, but it is also an empirical concept. Therefore, clarification of anticipatory terms used throughout this project must be made explicit. This section will offer clarification and distinction of key anticipatory concepts used throughout this project.

Although there are many terms used to denote the anticipatory practices of science and technology, I distinguish between genres of anticipatory concepts in order to establish the analytical framework of this project. Terms such as technological 'promises,' 'visions,' and 'expectation' are commonly used synonymously and connote similar meanings. While all of these anticipatory concepts denote future-orientated or anticipatory statements and representation in STS literature, expectations denote the analytical framing. Konrad et al. (2016) argue that expectations are considered to refer to particular technological developments or future states.

2.4.1 Promises or Hype

Briefly, promises, within the SE analytical framework, are generally coupled with the notion of hype, where promises are seen as strategically exaggerated expectations which are used in order to gain attention and interest in technological innovation (Brown & Michael, 2003a; van Lente, 2012). I associate promises with future investments, as sociology of expectations literature examines how futures become promises through the model of promise requirement cycles, also known as hype cycles (Brown et al., 2003; van Lente et al., 2013).

The model of promise requirement cycles address how futures become promised and how obligation around future promises is incited (Brown et al., 2003; Brown & Michael, 2003; Geels & Smit, 2000b). According to Brown et al. (2003), when making a promise through technological innovation, opportunity is first signaled, followed closely by a promise of innovation that includes the possibility of transformation through this innovation. Following this is the acceptance of said promise, meaning here, financial investment as well as social capital, is followed by the requirement to fulfill the promise. Expectation building or hype in the field of technological innovation, work strategically to deliver explicit promises, which aids in making the predictions more likely to succeed (Brown & Michael, 2003; Konrad et al., 2016; van Lente et al., 2013). Through these promises, expectations then guide innovation and encourage and legitimize financial investment and human engagement (van Lente & Rip, 1998).

Hype is needed in order to create investments surrounding new technological innovations. Hype is understood to exaggerate the benefits of technological innovation and underplay the costs or risks, Roberson (2020) argues, therefore, it is unlikely that these hyped promises can actually be lived up to (Brown et al., 2003; van Lente et al., 2013). Van Lente et al. (2013) argue that because high expectations are needed to garner funding for innovation, disappointment is

essentially built into the way promises and expectations operate within science and technology. According to Brown et al. (2003) these 'hype cycles' of expectations and frequent disappointment has led to serious costs in terms of reputations, misallocated resources, and investments. Even knowing that expectations frequently end in disappointment, Brown et al. (2003) argue that it may still be difficult to give up hope for the future. "Nevertheless, it remains difficult to see whether - this time – our high expectations might be justifiably warranted." (Brown, Rip & van Lente, 2003).

2.4.2 Visions and Expectations

Visions, within SE literature, imply a normative connotation, depicting desirable futures and not necessarily including assessments of likelihood or plausibility (Konrad et al., 2016). Konrad et al. (2016), argue that "visions often relay a fuller portrait of an alternative world that includes revised social orders, governance structures, and societal values." (Konrad et al., 2016, p. 467). Visions therefore are used in this project to represent desired future representations.

As articulated by Berkhout (2006), future visions denote "collectively held and communicable schemata that represent future objectives and express the means by which these objectives will be realised." (p. 302). A particular distinction in scope is made between visions and expectations, wherein, visions connote normative and desirable futures that fulfill objective, order, and technological characteristics, whereby the inclusion of *how* desirable future states are to come about is integral to expectations (Berkhout, 2006). The distinction here is that while expectations can refer to technological objectives alone, visions intend to offer a more holistic picture of the future desired state.

This project utilizes 'visions' to refer to the empirical evidence within this project, or in other words, visions are the 'thing' that is examined in this project. Technological future visions are the empirical object of this study. As such, I understand visions to represent the rhetorics and

utterances of desirable future representations, within this case, such as those from transhumanist's, including my interviewees. Evidence of transhumanist future visions, within this study comes from both primary and secondary transhumanist sources. These visions represent idealized futures, desired future representations, as well as the ways in which individual as well as collective, such as organizations and social movements, conceptualize themselves and what they imagine they will become.

While I use expectations in this project in alignment with the sociology of expectations theoretical framework. Expectations are first and foremost performative and can be seen as influencing decisions and discussion surrounding technological change (Borup et al., 2006; Konrad et al., 2016). Expectations are not merely descriptive statements about what may be possible in the future, as argued by Konrad et al. (2016), "expectations … affect what may actually happen. They are performative." (p. 465). The ways in which future visions perform or are enacted, make them real, in that the performance of these visions is what has impact in the world. Therefore, the performativity of expectations, the ways in which expectations justify decisions and actions, are examined throughout this project.

Within SE literature, visions are used as rhetorical devices to justify change. Berkhout (2006) argues that images are communicable through a shared 'frame' or 'schema' that represent a body of ideas about individuals, social groups, and in this case, the future. "These learned … schema [are] seen as functional to interpretation, sense-making and problem-solving by social agents, and to establishment and maintenance of cohesion and order of social groups. They are a means for reconciling experience with knowledge, while at the same time being grounded in the social and institutional frames within which agents act." (Berkhout, 2006, p. 301). The 'images' or 'schemata' that Berkhout (2006) uses, I call visions. This framing of visions has come to inform

expectations theoretical framework within STS. Berkhout (2006) argues further that expectations shape social actors behaviour, attitudes, and I argue, decision making. Images of the future, Berkhout (2006) argues, to some extent, take the same form as images of the present, or can be seen as modifications of images of the present: "in this sense they are always referenced to attitudes and perceptions about the present order of things." (p. 301). Expectations, as Berkhout (2006) argues, influence and reflect social attitudes and shared frames, or shared understandings of particular contexts. Future expectations are considered in reference to present attitudes and perceptions of the future. Visions, however, incite the need for change as Berkhout (2006) argues, that a function of future visions is to critique the present. "Indeed, many visions of the future are generated with the sole purpose of justifying change in the present. Visions are therefore used to anticipate and to rationalise change." (Berkhout, 2006, p. 301).

In this sense, it is important to be explicit that neither future visions or expectations are neutral and both tend to be interested (van Lente & Rip, 1998), 'moralised' (Berkhout, 2006), value-laden (Dandurand et al., 2020), or assessed through positive or negative valuation (Konrad et al., 2016). Konrad et al. (2016) argue that expectations can be read as promises which carry associated values. "Expectations … can be read as promises or concerns and warnings, implying a positive or negative valuation." (Konrad et al., 2016, p. 467). According to Berkhout (2006) visions are motivated, for example, politically, socially, ethically, and therefore visions of the future are generally organized dualistically, around either positive/negative or utopian/dystopian valuation. "The function of these constructions is to position actors with respect to the vision." (Berkhout, 2006, p. 303). Visions are positioned to seek social and/or financial investment, and therefore grounding visions within a morally charged and familiar notion such as 'progress' or 'hope,' Berkhout (2006) argues, is a way to make visions more attractive and accessible. Visions

grounded in familiar logics, such as progress and hope, or even fear and risk attract investment towards these visions. Berkhout (2006) illustrates moralized visions through the example of urban farming, where a neighborhood participates in producing small scale, low impact, urban agriculture. Within this vision, political and ethical values of stewardship as well as equity and participation are seen as moralized in an ideal vision of positive valuation (Berkhout, 2006).

Positive and negative valuation is particularly relevant to a case study on transhumanism, as while they are often accused of being overly optimistic about futures, these types of positive future representations offer narratives of hope and optimism, which are a drastic alternative to popular future narrative of present. Mali (2016) argues that transhumanist future visions challenge aspects of our current societies, in that they offer alternative possibilities to what is popularly imagined.

While future visions can be criticized for being overly speculative, these visions and future representations also challenge fundamental values and concepts of our current historical and cultural assumptions about time and societies (Jasanoff, 2015; Mali, 2016). Mali (2016) argues that studying technoscientific future narratives may then help us to better understand our current societies. Expectations for the future remind us that the world does not have to be the way that it is, there are many possible futures. According to Mali (2016) the pace of technological progress over recent history has inspired reflection on the role of innovative and emerging technologies in creating human futures or more than human futures.

2.4.3 'Real' or Imagined Futures

This section examines how futures are conceptualized through the lens of science and technology studies and more specifically the sociology of expectations. SE literature definitively examines future representations as 'real' futures, in that representations of the future are

performative and constitutive. Future representations are made real through their rhetorical and material impacts. This section examines the debates within SE literature between 'real' and imagined future representations.

SE literature traces the conceptualization of future representations, which were once conceived of as 'imaginary,' or in other words, only in one's thoughts. However, SE challenges this conception of future representations by arguing that future visions are performative and therefore have real social and material impact in the world. Sociology of expectations scholars (Adam & Groves, 2007; Borup et al., 2006; Michael, 2000; Tutton, 2017) take issue with George Herbert Mead's (1959 [1932]) argument of the future as being solely 'of the mind,' or purely of imagination, and therefore having no 'real' or material impact. According to Tutton (2017), SE scholars have spent significant time and debate surrounding the onto-epistemological status of the future, particularly focused on the question surrounding whether the future should be understood as imaginary, or 'of the mind,' or as 'real,' or having a material presence in the world.

Michael (2000) argues that "the 'performative textualized future'… renders connections and in doing so, constitutes a present" (p. 36), and therefore challenges Mead's (1959 [1932]) conceptualization of representations of the future as imagined by arguing for performative textualized future representations. Michael (2000) argues that "this model of the 'performative textualized future' derives from an emerging, albeit disjointed perspective… [which includes] the circulation and connections of multifarious, heterogeneous entities: humans, knowledges, languages, objects, and processes." (p. 34). In this sense, Michael (2000) challenges the meaning of 'present' in that the connection of past and future performances are in the present. However, Michael (2000) seeks to question the boundaries and meaning of 'present.' "Instead of thinking about the future as a representation, let us think of it as a 'textualization' by which I mean to

connote that the representations take material form." (Michael, 2000, p. 33). Therefore, Michael (2000) argues that "the representation of the future, conceptualized as a performative *materialized* artifact shapes and 'present' in which it performs… the parameters of the present can thus be said to be pliable, and further, this flexibility can be said to reflect the mode of movement [between past and future]." (p. 33-34). It is in the present that the past and future perform, however, the present extends to past and future through the artifacts and utterances performed as such.

Furthermore, Tutton (2017) interrogated the distinction that many sociologists have made between imagined and material futures, arguing that "there is a clear tension in terms of how to think about the relationship between imagination and materiality, between how futures are represented or performed in discursive practices, and their intended and unintended material consequences. I argue that it is this tension which has made the future wicked for sociology." (p. 485). In this regard, Tutton (2017) argues for the consideration of futures as 'entanglements of matter and meaning,' or a material-discursive approach, in challenging the imaginary and 'real' or material divide that is pervasive in sociology of the future. Tutton (2017) argues that a material-discursive approach should be thought of as '*enacted* in practice' as opposed to representationalist or performative, as SE scholars have previously theorized.

Tutton (2017) invokes Taylor's (2003) socialized notion of imaginary in order to provide an alternative to Mead's (1959 [1932]) 'of the mind' imaginary. As per Tutton (2017): "So, while from Mead onwards scholars have tended to treat the future as being only 'of the mind' because it is a time that people imagine beyond the reality of their present, Taylor['s]… work provides an alternative way to think about how imagination is a social practice, and is thus implicated in enacting the future in a different way." (p. 488). Tutton (2017) unpacks Taylor's (2003) argument:

> As opposed to seeing the imaginary as that which is 'of the mind', Taylor (2003: 106) argues for a socialized notion of the imaginary, which describes 'the ways in

> which people imagine their social existence [...] how things go on between them and their fellows, the expectations that are normally met, and the deeper normative notions and images that underlie these expectations'. This imaginary 'enables us to carry out the collective practices that make up our social life' (Taylor, 2003: 106). As Taylor's language of expectations implies, this imaginary is not only about the present but is also very much about the future as part of our everyday lives. (Tutton, 2017, p. 488)

Taylor (2003) therefore offers an alternative way of conceptualizing the enactment of future visions in the imaginary that move beyond the individual imagination and not only move between people but include a normative notion of future expectations as well. As per Tutton (2017) "discursive constructions of the future are not simply imaginative in the traditional sense but are thoroughly social practices. These practices are in turn implicated in forming certain materialities and with letting loose both intended and unintended consequences." (p. 488).

Tutton (2017) offers critique of the work of Adam and Groves (2007). Tutton (2017) argues that while Adam and Groves' work critiques the distinction between imaginary and material, they reproduce particular understandings of the imaginary within their latent futures concept in assuming matter proceeds meaning. Tutton (2017) argues that "one problem with this version of matter and meaning is that it implies a process whereby matter proceeds meaning – a latent material process becomes meaningful only after a certain time and presumably under certain conditions." (p. 486). In this sense, Tutton (2017) draws on Barad (2003) to argue "rather than seeing meaning as following from matter, I stress how matter and meaning are entangled with each other." (p. 486).

Tutton (2017) invokes Haraway (1987, 1988) to solidify his argument regarding both wicked futures and abolishing the distinction between imaginary and material futures. Tutton (2017) argues that Haraway (1987) uses the figure of the cyborg as an illustration of troubling the boundary between imagination and material reality.

> Haraway (1988: 592) insists that 'objects in the world' should not be viewed as 'a screen or a ground or a resource' but 'pictured as an actor and agent.' Accordingly,

> she notes, 'accounts of a "real" world do not, then, depend on a logic of "discovery" but on a power-charged social relation of "conversation"' (Haraway, 1988: 592). Haraway (1988: 596) playfully suggests that: 'the world resists being reduced to mere resource because it is – not mother/matter/mutter – but coyote, a figure of the always problematic, always potent tie between meanings and bodies.' Her invocation of the coyote figure points to an important insight: that relations of matter and meaning are difficult to do – to conceive of and act with. They rarely come easy. In Haraway's terms, the future is not a 'free resource' open to human will to simply refashion, but is wicked – it is difficult, dangerous and tricky to act on – a 'problematic and potent tie' between desires and dreams and the unintended material consequences of our actions. (Tutton, 2017, p. 486)

As per Tutton (2017) on Haraway (1987, 1988), Haraway critiques the Heideggerian conception of world as resource, and instead attributes action and agency to objects, or what I will argue as materialization or configuration, as opposed to objects use as 'standing reserve' to be exploited (Heidegger, 1954). Further, Haraway critiques the political and power dynamics associated with 'discovery,' which is a loaded term in resource extraction, associated with colonization, early science as well as the male gaze. Haraway's (1988) use of the coyote figure compliments Tutton's (2017) wickedness in describing the relationship between material and human, future and present, and dreams and unintended consequences.

2.5 The Sociology of Expectations: A Brief History

It may be tempting to think of today's focus and concerns for the future as novel, however, concern over our futures and how they come to be shaped are not new stories. Concern for shaping the future has been present in social science since the early days of the academic discipline, which began during the political upheaval of the industrial revolution (Adam, 2009; Konrad et al., 2016; Tutton, 2017; van Lente, 2012). Adam (2009) argues that the industrial revolution saw a rise in scientific knowledge along with socio-economic improvements and therefore, people began to impose their will on both their own individual as well as collective futures. Adam (2009) argues this societal change, especially throughout Europe and most specifically in France, brought with

it an awareness of agency and enactment towards futures. “The future, therefore, was no longer a mere continuation of the past but ever more a consequence of actions in the present.” (Adam, 2009, p. 9).

Adam (2009) argues that the socio-political upheaval in France between the middle of the eighteenth and the nineteenth centuries fostered philosophical thinkers to think about how the future could be different and begin to enact these changes. Adam (2009) argues that the social philosopher and political theorist, Karl Marx, although coming from a different political context and tradition, also sought to change the world for the better. “Marx too sought not merely to interpret but to change the world. … Like the French social thinkers before him, Marx provided visions of how the world could (and should) be different from its present alienated form and he identified paths that would lead to the utopian ideal he constructed.” (Adam, 2009, p. 9).

What the French and German philosophical thinkers have in common is the desire and intention to make the word a better place by shaping their futures, as according to Adam (2009). “All viewed themselves as future makers and placed their faith in the power of reason and science as means to achieve their desired visions.” (Adam, 2009, p. 9). Adam (2009) argues that this future-oriented approach to social philosophical analysis ended with the influence of the objectivist social science approach of Durkheim, as well as the work of Symbolic Interactionists. Konrad et al. (2016) argue that it is Durkheim who has influenced the foundations of collective expectations as they are known in SE literature today. Collective expectations represent an interest in expectations as social facts, which relies, in a basic sense, on Durkheim’s dimensions of collective conscience that both constrain and guide behaviour, as argued by Konrad et al. (2016).

The exploration of the impacts of future representations can be traced to the early days of social sciences as well as iconic philosophical thinkers. These influences impact how and why this

theoretical framework has come about. Van Lente (2012) described a similar sociological history to Adam (2009), while arguing that these philosophical influences stressed the inherent nature of humans thinking within a future orientation.

> The classical sociologists Weber, Mead and Schutz stressed that future orientation is an inherent characteristic of human behaviour, since decisions and activities are framed by intentions and ideas about a future situation. People act not only in reaction to the past (socialisation) or present (roles in a social structure), but also related to futures, as designers of their own lives. The orientation towards the future applies to the behaviour of individuals, groups, organisations and society as a whole (Konrad, 2006). In all cases, actions, reactions and decisions are framed in images of the future that circulate in professional networks or in general media. (van Lente, 2012, p. 772)

Van Lente (2012) argues towards what I call normative progress logic in the following analytical chapters. Normative progress logic represents the inherent belief of progress in science and technological innovation. This has become an intrinsic belief that has existed for a long time, as argued by Adam (2009) and van Lente (2012). Van Lente (1993) argues that the sociology of expectations literature is underpinned by the discursive abstraction of 'Western progress.' 'Progress,' in sociology of expectations perspective, describes a cherished and collective, if flexible and ill-defined, staple of western culture (Brown & Michael, 2003; van Lente, 1993). The normative technological progress narratives that are being addressed are not only used within transhumanist discourses, but widely accepted as an autonomous force, which is what makes its use within transhumanist discourses significant and appealing.

Borup et al. (2006), argue that it is important to consider the ways in which concepts change over time, especially over longer time frames. Borup et al. (2006), citing Marvin (1990), argues that "expectations tend to reflect current conceptions of technological utility or, as Marvin puts it, 'the tendency of every age to read the future as a fancier version of the present.'[(Marvin, 1990a)]." (p. 288). This is therefore an important aspect to consider, when analyzing future visions. Borup

et al. (2006) argues that the general conception of the future and therefore also expectations for the future have changed over historical timeframes. For example, Borup et al. (2006) argue that the discourse of inherent belief in the progress of science and technology is a modern phenomenon. This example serves as a reminder that what is valued today, especially when looking to the future, has not always been the case. This conception of visions and expectations within a historically changing timeframe cannot be taken for granted, as I discuss within chapter 4, over a brief history of transhumanism, where the tendency for transhumanists to retrospect transhumanist narratives into historical timeframes, is, I argue an anachronistic fallacy.

I have established above that there is a long and influential history of thinking about and how to influence the future. In the discussion of accounting for changing expectations over time, Konrad et al. (2016), describe these changes as temporal dynamics and pattern, which they exemplify through hype cycles, of promise and disappointment.

Tutton (2017) argues that in the 1960's, scholars in both the US and Britain fought for a revival of the sociology of the future. These sociologists, according to Tutton (2017), relied on the first generation of sociologists, such as Marx and Comte, to offer legitimacy to their cause. While the 1960s revival of sociology of the future was ultimately unsuccessful; there are particular legacies that left their mark, Tutton (2017) argues. For example, the early conception of the performativity of the future is representative through Merton's (1948) notion of self-fulfilling prophecy. Merton (1948), argues that "public [...] prophecies or predictions become an integral part of the situation and thus affect subsequent developments." (p. 195). While Merton (1948) was concerned with the effects of false or baseless predictions influencing other's behaviours, Tutton (2017) argues that sociologists of expectations understand future predictions in a different way,

and instead begin to explore the implications of future visions through the exploration of the performativity of expectations.

The attempt to establish the sociology of the future in the 1960s as a legitimate sub-field was short lived (Bell, 1996; Tutton, 2017). Tutton (2017) argues that "in light of the perceived failure of Marxist anticipations of the future, John Urry (2008) claims that sociologists retreated from making predictions themselves and became weary of imagined alternative futures as misguided or obfuscating today's social and economic struggles." (p. 479). Despite this lack of success, Tutton (2017) argues that the new strands of scholarship on the future emerged from science and technology studies (STS) since the late 1990's. Adam (2011) argues that it has become increasingly difficult to argue against a future-less sociology, especially when the effects of socio-scientific impacts are becoming increasingly farther future.

I have included the multiple generations of sociology of futures history above to highlight the history that has come to inform today's normative progress logic, by which I mean the taken for granted belief in the inherent progress of scientific and technological innovation.

In the mid-1970s scholars, like Rosenberg (1976), an economist who specializes in the history of technology, were beginning to look at technological expectations for the future through the examination of technological innovation. The late 90's to mid 2000's saw a rise in the field of the sociology of the future, when scholars started exploring questions concerning the role of expectations in shaping scientific and technological change (Tutton, 2017). Scholarship within this field comes from areas such as the sociology of technology and science, history, economics, and innovation studies (Borup et al., 2006).

As I have illustrated, the sociology of expectations literature has had a long interest and long influence from the multiple generations of sociology of the future that have come before it.

SE originated in the 1990's with van Lente's (1993) *Promising Technology: The Dynamics of Expectations in Technological Development,* van Lente and Rip's (1998) *The Rise of Membrane Technology: From Rhetorics to Social Reality* as well as the seminal sociology of expectations reader, *Contested Futures: Contested futures: A Sociology of Prospective Techno-Science* (2000), edited by Brown, Rappert, and Webster.

Selin (2008) captures the contemporary intentions and purpose of SE clearly by clarifying that scholars are interested in investigating "the future tense and how the future – as temporal abstraction, as story, as discursive strategy – is a component of social reality." (p. 1891). Selin (2008) argues for the importance of a socio-technical perspective as well as futures perspective when examining what types of resources come together for technological innovation. "[SE] has evidenced how futuristic stories attending new technologies, the promises made, and the future benefits specified, all contribute to or detract from the success, strength, and efficacy of the resources poured into an innovation." (Selin, 2008, p. 1891). The expectations surrounding future technological innovation, be them hope, fear, or hype, Selin (2008) argues, are formative and embedded elements of innovation and should not be seen as separated from scientific and technological processes.

Finally, sociology of expectations (SE) literature, sometimes referred to as sociology of technological expectations, or STE (Birch, 2017, 2023; Birch et al., 2014; Hedgecoe & Martin, 2003), has centered around technological expectations in science and technological innovation for some time. STE, as opposed to SE, is indicative of the influence from the field of economic sociology (Balcer & Lippman, 1984; Birch, 2017; Birch et al., 2014; Rosenberg, 1976). This is indicative of expectations examinations becoming initiated through the field of STS before then

filtering into sociology and then finally to fields beyond, such as economics. (See Beckert, 2013 for fictional expectations or Birch, 2023 for economic sociology/assetization).

From within SE, Borup et al. (2006) make an explicit distinction between expectations and technological expectations. "While expectations in general can be described as the state of looking forward, technological expectations are more specifically described as "real-time representations of future technological situations and capabilities." (Borup et al., 2006, p. 286). For the purposes of this project, I have used the sociology of expectations throughout, because this is an STS and social science project at heart, as opposed to a study motivated by economic questions. I consider these terms synonymous and that their inquiry of the impacts of technological future expectations are the same, however their terms are influenced by different fields of study, making the lens for the way questions are shaped different.

2.6 Sociology of Expectations Theoretical Framework

2.6.1 Introduction

This section examines key theoretical themes from the sociology of expectations framework that are used to analyse the empirical data in the chapters below. Different narrative dimensions identified in the sociology of expectations literature act as different types of rhetorical devices through which to analyse representations of the future, such as collective expectations, performativity, interpretive flexibility, retrospecting prospects, reflexive expectations, materialization, and social and financial decisions surrounding future expectations. Each narrative theme does different kinds of rhetorical work. For example, while performativity frames how visions become enacted (Konrad et al., 2016; Michael, 2000; Van Lente, 1993) and also how they mobilize resources (Borup et al., 2006), collective and individual expectations (Berkhout, 2006; Konrad et al., 2016) allow for an analysis of how transhumanist visions gather support and shape

future decisions. It is important to note that any of these dimensions of future expectations are not exhaustive or discreet but work in combination.

This section begins with the ways in which SE conceptualizes the future and then examines SE themes that are critical to my analysis in later chapters. Themes discussed here include collective expectations, the performativity of expectations, the interpretive flexibility of visions, retrospecting prospects, the materialization of expectations, as well as social and financial decisions implicated in future visions.

2.6.2 Transhumanist Future Discourses Analytical Themes

This section introduces the theoretical and analytical concepts that will be used in chapter 5, where I examine historical and contemporary transhumanist discourses. This chapter examine both historical and contemporary transhumanist narratives and therefore the main theoretical concept used in this chapter is retrospecting prospects, which focuses on the temporal dynamics of future expectations and aids in the examination of part representations of the future.

2.6.2.1 Retrospecting Prospects

I used retrospecting prospects to examine internal historical transhumanist narratives. In 'retrospecting prospects,' Brown and Michael (2003) reflect on the impacts that past futures, particularly past failed futures, have on present future expectations. While the impacts of how past future failures inform decisions surrounding present futures will be explored further in chapter 6, Brown and Michael's retrospecting prospects offers an analytical lens through which to analyse internal transhuman histories. Brown and Michael's (2003) focus on analysing "the relevance of future representations over time rather than their role at any single moment." (p. 7), or 'retrospecting' analytical accounts of expectations. Brown and Michael (2003) focus on what can be learned by looking back to expectations that were once held of the future. Brown and Michael

(2003) illustrate this through a case within clinical biotechnology, specifically xenotransplantation, because the case involves a changing landscape of expectations surrounding the use of animals for convenient and successful donor tissues and cells.

In 'retrospecting prospects,' Brown and Michael (2003) look at "how actors contextualize their present futures in relation to their narratives of the past future, that is, their retrospections on futures that failed or succeeded in being realized." (p. 7). Brown and Michael (2003), use a xenotransplantation case study in order to illustrate the temporal dynamics of changing expectations. Brown and Michael (2003) argue that expectations "take shape in relation to temporal representations of change and the future." (p. 8). Representations of future visions can be temporally dynamic and can be contemporary representations of a future yet to pass but can also represent past memories of future expectations. Brown and Michael (2003) illustrate this by arguing that past expectations of xenotransplantation now appear grandiose and naïve. It is only in retrospection that these visions can be reflected upon in terms of their success or failure.

Borup et al. (2006), argue that technological expectations serve as 'real-time representations' of future desires, as well as being considered constitutive, subjective and normative in nature. This is to say, when we speak of futures we are speaking of a 'substantive representation' of the future (Michael, 2000). According to Michael (2000) future visions are undoubtedly informed by representations of current and past experiences, however, Brown and Michael (2003) explicitly stress the significant difference between real-time current expectations for the future and memories of former expectations, marking a clear distinction between how the future was once thought about, and how the emerging field of expectations is changing how the future is now conceptualized. This is to distinguish between contemporary visions of future

representations that have not yet come to pass, and the clarity that can come with retrospection from future representations from the past.

For example, Brown and Michael (2003) illustrate that one's risk perception is shaped by different identifiers of potential risks in future visions. Actors can see xenotransplantation as new and exotic or can view this process as an incremental extension build upon prior innovation. This example illustrates risks within a contemporary debate about future visions, whereas the previous example, where they reflect on what expectations of the transplantation field were like ten years ago, is a retrospection of memories of future expectations.

This concept aids in examining the examples of internalist transhumanist histories. While transhumanist internal histories do not exemplify failed futures as such, the examples transhumanists use to legitimize a history exemplify some of the pitfalls of retrospective tendencies, such as technological determinism and redefining expectations in the present (Brown and Michael, 2003).

2.6.3 Decisions and Fragmentation Analytical Themes

This section examines the key analytical themes included in chapter 6, which include collective expectations, the performativity of expectations as well as a brief expansion or critique of performativity, fragmentation, interpretive flexibility, wicked futures and reflexive expectation. While collective expectations, and performativity and its critiques come directly from SE analytical themes, wicked futures, interpretive flexibility and reflexive expectations are terms adopted form other disciplines that scholars have utilized within the examination of future expectations. I add here the original concept of fragmentation, a concept that I propose works to examine the implications of the multiplicity of a niche futurist social movement, such as transhumanism.

The analytical themes within this section are utilized to make sense of how transhumanist future visions work to enroll investment, both socially and financially, which ultimately impacts decision making for the future.

2.6.3.1 Collective Expectations

In order to understand how future visions come to create obligation or enroll investment, it is important to understand that commitment is created through shared reference points for future visions, or the collectivity of future expectations. One way in which future representations become expectations and create promise and therefore obligation is through collective or shared future visions, or in other words, that the frame of the visions share common ground. Therefore, collective expectations refer to publicly available statements that must share some degree of commonality. As Konrad et al. (2016) argue, "the main performative roles of expectations in mobilizing, guiding, and coordinating diverse sets of actors involved in technoscientific fields require expectations which are to some degree common, shared reference points." (p. 466).

Collective expectations, Berkhout (2006) argues, involve communicable images that represent a particular set of ideas, which in this case are about technological innovation in the future. The image serves as a 'frame' or 'script' which is seen as "functional to interpretation, sense-making and problem-solving by social agents, and to [establish] and [maintain] cohesion and order of social groups." (Berkhout, 2006, p. 301). Images and visions need to have a certain amount of shared understanding, to create order within and be shared between social groups.

Berkhout (2006) illustrates this example through the concept of ecological utopias, specifically within the expression of urban agricultural. Utopias can be conceptualized as a response to a gap between expectations, in a normative sense, and lived experience, especially within marginalized groups according to Berkhout (2006). The example of the utopian vision of

urban agriculture invokes an objective, which in this example is small scale, low impact urban agriculture, post-pandemic, we can perhaps envision victory gardens. This vision contains order, invoking a cooperative, community, locally embedded process of production and consumption, as well as the technologies that need to be utilized in order for this vision to be realized, which in this case includes low-tech gardening tools (Berkhout, 2006). Berkhout (2006) argues: "The vision also illustrates a set of political and ethical values of stewardship, equity and participation, and so can be said to be *moralized*." (p. 303). The moralized value is a feature of a future vision, which is typically organized around positive/negative valuation, or utopia/dystopian (Berkhout, 2006). Eliciting a morally charged vision serves to construct a position wherein actors become obligated or compelled to participate in bringing this vision to reality, namely by eliciting notions like hope or progress (Berkhout, 2006).

As explained by Berkhout (2006), although future expectations can be both individual as well as collective, it is collective visions that are of analytical interest in the context of the sociology of expectations, in that while most individual expectations remain private they are unlikely to become socially significant. Individual expectations differ from collective expectations in that they describe a psychological understanding of expectations (Konrad et al., 2016; van Lente, 2012).

Collective expectations also serve to coordinate actors and groups. Beyond shared frames, Michael (2000) argues that expectations are relational, in that they are "between-persons, [and] instrumental in the structuring of relations" (p. 22). Michael (2000) captures scale and temporality between individual, collective or even generational future expectations. Each scale provides a different rhetorical function. Generally, a hoped-for effect of collective future expectations is to generate a sense of responsibility, in inviting one to act in aiding a particular future for an

individual or future state to come to pass. Additionally, Michael (2000) argues that future expectations work rhetorically in inviting us to identify with these futures on an individual level or collective level, for example when an expectation concerns the "future generation of 'our' children" (p. 26). Collective expectations, therefore, serve to create coordination of actors through common ground, and obligations through future promises.

2.6.3.2 Performativity of Expectations

Performativity is a fundamental conceptual frame for understanding future expectations, and in analysing the role of decisions for the future made in the present. In order to examine how transhumanist future visions impact decisions and investments we make today, as examined in chapter 6, it is fundamental to understand how futures perform or become enacted.

Much of the sociology of expectations literature examines the performative role of future representations (Konrad et al., 2016). As argued by Alvial-Palavicino (2016), anticipation for the future can no longer be separated from techno-science. The performativity of future expectations has primarily been studied by examining the ways in which future-oriented representations, such as discourses, decisions and materialities influence the ways in which society makes sense of science and technology (Konrad et al., 2016). Expectations are performative, then, in that the rhetoric of future representations both generate and are generative of new technological innovation.

Van Lente (1993) argues that, "the future" is socially constructed, and expectations are performative in that future rhetoric are not only representations of something that does not yet exist, but they *do* something, they are part of the world of action, such as "…advertising, showing directions, creating obligations." (p. 191). It is in this way that Borup et al. (2006), argues that expectations are understood to be performative, in that, by performing such futures, expectations

make these futures real. According to Selin (2008), it is this relationship between expectations and the follow through that creates a "real future."

Future expectations are socially generative, that is the "guide activities, provide structure and legitimation, attract interest and foster investment." (Borup et al., 2006, pp. 285–286). Future representations that are generative can therefore be understood as expectations, in that they elicit promise, action, and legitimation of shared futures.

Rhetoric about futures, or socially constructed visions about the future have an impact on decisions about the future, which include investment and resource mobilization, and also how and what material configurations of future visions become realized or manifested. Alvial-Palavicino (2016) argues that expectations are considered performative because they have an effect on the technological innovation process. According to Alvial-Palavicino (2016), "expectations do not merely narrate the future, but actually have an effect on the technologies they refer to … They fulfil specific functions and contribute to the configuration of the field they refer to: mobilizing actors, resources, providing guidance and coordination, enabling sense-making processes, and legitimizing socio-technical arrangements (Brown & Michael, 2003; Swanson & Ramiller, 1997)." (p. 140). Expectations are performative in that they are more than just words, but have real world impact on future narratives, decisions and as well as technological innovation and design.

Alvial-Palvicino (2016) argues that "the performative aspect of expectations refers to the fact that they are constituents of innovation processes, particularly for emerging technologies." (p. 140). Therefore, future expectations in technoscientific innovation are seen as fundamentally 'generative,' in that they enact change both socially and technologically.

One of the dynamics through which futures perform is the positive and negative valuation of visions, as discussed in the earlier visions section. Visions perform in an interested way,

revolving around hopeful promises or mitigating risks, aka, positive/negative or utopian/dystopian. These valuations enroll actors by eliciting moralized values (Berkhout, 2006).

Another way in which future representations perform is through the configuration of visions through materialization. According to Konrad et al. (2016), the performativity of representations of the future has focused on investigating speech/rhetoric, such as documents or speech, or through material embodiments, such as images, film, technological objects or strategic practices. Much of the SE literature has analyzed future representations performatively through discursive or material means (Alvial-Palavicino, 2016; Borup et al., 2006; Konrad et al., 2016; Michael, 2000; Selin, 2008). Both the discursive as well as material manifestations of future visions will be examined throughout this project.

A further dynamic of the performativity of expectations is their collective nature. Collective expectations serve to mobilize, legitimate and coordinate the real world construction of science and technology both discursively and materially (Borup et al., 2006; Konrad et al., 2016; Selin, 2008; Van Lente, 1993). Future expectations are performative, or as Borup et al. (2006) argue, they are constitutive, in that they are not only words but work to mobilize resources and create shared understandings of future goals between groups, create allies and therefore generating collective expectations. In order to perform this way, future visions need to have common reference points. Konrad et al. (2016) argue that "the main performative role of expectations in mobilizing, guiding, and coordinating diverse sets of actors … requires expectations which are to some degree common, shared reference points." (p. 466). In this case, shared transhumanist visions serve to coordinate heterogeneous groups of actors under positive technological future representations.

The characteristics of the ways in which expectations perform futures above is not exhaustive, but the dynamics of expectations and the ways in which they perform will continue to

be examined throughout this chapter and the rest of this project. While the performativity of expectations is directly analyzed in chapter 6, it is important to understand that within the sociology of expectations, expectations are inherently understood to perform, or some such facsimile thereof, which I examine in the section below.

2.6.3.2.1 Sociotechnical Vanguards, Material-Discursive Enactment, and Reflexive Expectations

In this section, I examine SE literature that builds on or critiques the concept of performativity within expectations and calls for alternative conceptual framings. While this is, however, not an exhaustive list, I examine Tutton (2017), Birch (2023), and Hilgartner (2015), all who add to sociology of expectations literature by building on the concept of performativity.

In examining the role of future visions of small avante-garde social movements, which Hilgartner (2015) calls sociotechnical vanguards, he argues that a unidirectional explanation of performativity, that future visions influence broader technological innovation or that technological imaginaries drive vanguard visions, is too simple. Hilgartner (2015) argues for a more dynamic approach, which considers the co-production (Jasanoff, 2004) of visions and the groups that advocate for them. As to their roles, Hilgartner (2015) argues that vanguard group's play an important role in technological innovation and a broader technological narrative, importantly including the material configurations of these visions. "Vanguard groups … are playing an important role in driving the overall [technological] movement, even as they compete with one another and promote incompletely aligned views. ... As part and parcel of the process of innovation and change such groups do not just articulate visions but they also take action on the ground actually to prototype, build and configure practices that should – literally – realize their ideas." (Hilgartner, 2015, p. 35). Hilgartner (2015) highlights the importance and contributions of these vanguard groups, who, even though they are competing with one another for similar resources,

form an important aspect of the technological innovation landscape. Because of the niche multiplicity of transhumanist groups, I consider their representations through the concept of sociotechnical vanguards in chapter 6.

However, Tutton (2017), argues for a material-discursive lens which examines futures as *enacted* in practice as opposed to performative in nature. As such, Tutton (2017) challenges the binary between the real and the imaginary that once permeated the sociology of the future. Tutton (2017) argues that the sociological tradition of seeing the future as imaginary and therefore not 'real' or material should be abandoned. As per Tutton (2017), "[we must think] sociologically about the future in material-discursive terms as *enacted* in practice rather than in representationalist or performative terms." (p. 485). Tutton (2017) seeks to challenge the distinction between real and imaginary futures in previous sociology of expectations literature, which is examined above in section 2.4.3. This division will be explored more thoroughly in chapter 7, regarding the materialization of future representations.

Birch (2023) combines the concept of expectations from the sociology of expectations literature and reflexivity from innovative financing to discuss reflexive expectations. Birch (2023) argues that social actors may change or make decisions in response to their understanding of how expectations work to enrol others, and in this sense then expectations should be considered as reflexive as much as performative. Birch (2023) argues, "Analysing how [expectations] reflexively bring the future 'into being' … requiring us to examine the practices, processes, and discourses that stretch from now into the future – and not simply to analyse how *the* future is enacted in *the* present." (Birch, 2023, p. 33). This concept will be explored more thoroughly in chapter 6. While these themes will be explored later, it is important to understand that the concept of performativity

as related to futures, while seminal within the sociology of expectations theoretical framework, has been taken up and challenged in a plethora of ways.

2.6.3.3 Fragmentation

I use fragmentation in this project as an original contribution to the analytical framework. I use fragmentation as an addition to the expectations theoretical framework, to aid in the analysis of a heterogeneous social group with a plethora of future values and goals. I use fragmentation within the specific case study of this project to identify the multiplicity of social groups that represent a fractured state of the transhumanist philosophical worldview. Because transhumanism does not have its own value ethics, and its definition is broad, meaning that it can support many different worldviews, through fragmentation, I consider the lack of cohesion and defining visions within transhumanism.

Transhumanism does not stand for a singular and unified purpose, it has been interpreted through different ethical, political and religious worldviews, and I therefore consider the factions, a variety of social groups, as fragmented. While there are many social groups that work towards transhumanist or transhumanist type goals, which represents its whole, I argue throughout this project that the meaning behind transhumanism has fractured beyond having much influence beyond a personal identity, which is the sentiment I capture within fragmentation.

Furthermore, I apply fragmentation to describe the distinctive division between materialized enactments of future visions in chapter 7. The main distinction of fragmentation that I make throughout the analysis of three narrative stories is between the categorization of medical and therapeutic technologies and technological future visions. By fragmentation of material configurations, I mean that there is a particular enactment or intention behind the material configuration, in this case mainly between medical and scientific applications.

2.6.3.4 Interpretive Flexibility

While the concept of interpretive flexibility (Pinch & Bijker, 1984) is not specifically or widely used as a sociology of expectations concept, Berkhout (2006), uses interpretive flexibility to illustrate the need for future visions to be malleable in order to enroll investment. While interpretive flexibility is generally understood to make sense of the capacity of technological objects to be interpreted differently by different social groups and actors (Pinch & Bijker, 1984), this section relies of sociology of expectations literature to examines how interpretive flexibility applies to future expectations (Berkhout, 2006; Borup et al., 2006, Brown and Michael, 2003).

Because future expectations offer potentialities for different futures, these visions generally require endorsement for them to become actualized, Berkhout (2006), argues. In order to become successfully adopted, future visions therefore need to have a certain amount of flexibility. There is some reflexivity enrolled within this process, as Berkhout (2006) argues, "this means that their modification in the process of adoption by other social actors is also typically already anticipated by the bidder." (p. 301). Bidders and investors both understand that visions have a certain amount of flexibility, because without this interpretive flexibility, as Berkhout (2006) argues, it would be difficult to enroll new actors into a future vision. "To be adopted by a new adherent, a vision would need to be matched to a new set of interests and a new (and in part private) image of the present." (Berkhout, 2006, p. 301). Both bidders and proposers of a vision understand that there will be modifications or changes to future visions before they become realised. Berkhout (2006) argues that "no one proposing a vision of the future … will normally believe that their vision will be fully realised. Bidders will also typically anticipate the need for some further elaboration of a vision." (p. 302). Investors also understand that they may be one of many bidding of particular future visions, and therefore that each bidder also has their own interest in particular visions of the future.

Berkhout (2006), therefore argues that they battle over expectations is never complete, because even after becoming realised, future visions may undergo changes. Therefore, expectations need to be understood as malleable and open to interpretation and reinterpretation, both until realization and also beyond, pointing out also that not all visions become realised.

Brown and Michael (2003) argue that the difference in expectations between groups may also come from asymmetries in access to information that expectations are made on. I discuss this in chapter 6, where some actors express insider knowledge of technological development that the general population does not have access to. This type of information enables decisions making about the future in a different way, because they have a different understanding of what types of innovation may be available in the near future, that others do not, even if this innovation changes before it becomes realized.

While Berkhout (2006) and Brown and Michael (2003) examine the flexibility of visions between social groups or actors, Borup et al. (2006), argues that expectations can be flexible within an individual depending on who the vision is being delivered to. Borup at el. (2006), illustrate this point be arguing that an actor working in a scientific field may wear many different 'hats' when discussing expectations in their field, which ends up offering contradictory expectations. "When wearing a public entrepreneurial hat they might make strident claims about the promise of their research, but when among research peers, they will be much more cautious and equivocal, though publicly still committed to the promises associated with their field." (Borup et al., 2006, p. 292).

This project therefore uses interpretative flexibility as a way of understanding social future expectations as opposed to applying it to technological objects. The interpretive flexibility of future visions within transhumanist narratives is an important part of my analysis in chapter 6, especially because of the multiplicity of transhumanist meanings and values.

2.6.3.5 Wicked Futures

While not an SE concept, Tutton (2017) utilizes the concept of 'wicked futures' through which to examine the contemporary scale and scope of future problem solving. I adopt the use of wicked futures from Tutton's (2017) "Wicked futures: Meaning, matter and the sociology of the future," which articulates the nuances as well as empirical and methodological difficulties that sociologists have in studying the future, in that the future is a wicked problem, or a difficult and pernicious problem. Tutton (2017) defines wicked futures as per Horst Rittel's 'wicked problems,' via Churchman (1967):

> In adopting this language of wickedness, I allude to Horst Rittel, who coined the expression 'wicked problem' to refer to that 'class of social system problems which are ill formulated, where the information is confusing, where there are many clients and decisions makers with conflicting values, and where the ramifications in the whole system are thoroughly confusing' (Churchman, 1967: 141). (Tutton, 2017, p. 479)

This project is thoroughly saturated in the examination of future representations. Tutton's (2017) wicked futures offers a lens through which to understand why and how the future has not only become understood differently over time, but that present representations of the future are, generally speaking, negatively valued. Concern, risk and warnings abound about potential futures which look grim. As Tutton (2017) describes, these narratives abound because of the nature of these future representations as well as the way they are addressed in the present. Because futures are wicked problems, they are understood differently between social groups and actors, multiple solutions to future risks are interested, in that there are both political and financial investments in solving wicked problems. However, the nature of wicked problems is that they do not become truly solved, only re-attempted solutions.

The defining features of a wicked problem are also explored, as I frame transhumanist future visions as within the boundaries of wicked futures in chapter 7. Tutton (2017) refers to Rittel and Webber (1973) in defining the features of a wicked problem which includes:

> 'Open societal systems' problems (the example they provide is that of poverty) are wicked in the sense of being malignant, vicious or tricky in contrast to scientific problems which they characterize as 'tame,' 'benign' and ultimately solvable. They note that describing a wicked problem is difficult not least because each wicked problem is a symptom of another (intractable) problem; such problems are never solved only *re-solved* time and again, and what stops work on tackling them are resources or time or political will; further, their resolution is judged not by objective criteria but by different social actors; own judgements of what is 'good' or 'good enough' or 'bad' or 'worse' compared to another and consensus is not likely to be reached; every re-solution creates consequences, some or many of which are unintended and unforeseen; and there is no fixed number of available re-solutions available to be tried out to re-solve these problems. (Tutton, 2017, p. 479)

In other words, wicked problems are large societal problems that are pernicious, and difficult to solve because they are not discreet societal issues but wrapped within one another. Wicked problems do not get solved because of a lack of resources and time, as well as political and social disagreement. Working towards solutions on wicked problems also implies unforeseen consequences (Tutton, 2017). Rittel and Weber (1973) interestingly contrast scientific problems, which they consider easily solved, from societal or social problems. However, I consider transhumanist visions and goals to be sociotechnical in that the social cannot be separated from technical or scientific problems. I examine these characteristics of wicked problems by applying them to transhumanist future visions, framed by Tutton's (2017) wicked futures in chapter 6.

2.6.3.6 Reflexive Expectations

Reflexive expectations, as coined by Birch (2023), impact decision making in that future visions affect decisions made by social actors about the future today, and that they may change their decisions based on other actors or expectations. Actors themselves also become a way in

which expectations affect the future and start to deliberately create expectations that they think will cement their objectives but often forget about unintended side effects of effects of contestation.

Birch (2023) combines expectations from sociology of expectations literature and reflexivity from innovative financing to discuss reflexive expectations. Birch (2023) cites Giddens (1984) to describe that reflexivity as "the idea that social actors change their actions in response to knowledge claims about the world (Giddens, 1984)." (p. 33). Birch (2023) argues that social actors may change or make decisions in response to expectations, and in this sense then expectations should be considered reflexive rather than performative. As per Birch (2023), "Reflexivity is particularly important to consider when it comes to the discussion of expectations, because it implies that expectations are not constitutive or generative as previously theorized, since the stories, narratives and knowledge claims that underpin them can reconfigure the world although not necessarily performatively." (p. 33). Therefore Birch (2023) argues that expectations are reflexive in that actors do not make decisions to reinforce expectations but in response to them. This is an important concept in considering how transhumanists reflect on their visions and the reception of their visions by a wider public, as explored in chapter 6.

2.6.4 Radical Futures/Mundane Presents Analytical Themes

This section examines the four key analytical themes included in chapter 7, which include the material configurations of expectations, implications of social and financial future decisions, and mundane presents. While the first two themes are framed within the sociology of expectations literature, mundane presents is not direct SE analytical themes. I discuss the concept of mundane presents, which is a final point of analysis in this project, wherein, I argue that grandiose future narratives are contemporarily showing up as mundane interventions. Mundane, here, can be understood to embody the everyday practices of future making (Adam, 2005; Tutton 2017).

These analytical themes are used in chapter 7, Radical Futures/Mundane Presents to explore how future visions become materialized. This chapter focuses deeply on three stories from non-transhumanist actors who are technological innovators or communicators in order to explore what impacts transhumanism has on technological innovation.

2.6.4.1 Material Configurations of Expectations

Chapter 7 examines the ways in which representations of the future are constituted materially within the sociology of expectations (SE) theoretical framework. According to Borup et al. (2006), expectations circulate in a variety of shapes and forms. Theorists in SE consider the relationship between imagination and materiality by examining visions as both imaginations, utterance, or promise, and the ways in which future expectations become embedded or inscribed within objects, such as texts, actions, bodies, or machines, as well as the relationship between the two (Borup et al., 2006; Michael, 2000; Selin, 2008; Tutton, 2017).

Michael (2000), argues that representations of the future are grounded in the material, in that "the performativity of these representations does not take place in some abstract, a-material domain. It is conducted in material settings, where bodies and texts, for example come into contact or close proximity at least." (Michael, 2000, p. 33). In this way, van Lente (1993) argues that visions become scripted into technological design. Therefore, as per Alvial-Palavicino (2016) "concretely the future is embodied and made present through expectations, which have a performative effect in the constitution of socio-technical fields. These expectations are embedded in socio-material practices through which they are produced, shared, shaped, and contested." (p. 135). In other words, expectations have material impacts. To reiterate, expectations have real social and material implications, such as the ways in which they shape research and development funding decisions.

For example, Alvial-Palavicino (2016) explores the anticipatory practices, or "the socio-material practices in which expectations are embedded" (p. 151), by exploring technologies two technologies that have recently gone through 'hype cycles,' graphene and 3D printing. Alvial-Palavicino (2016) highlights the difference in cases, "graphene stands for a science-push discovery that is turned into a commodity. In contrast, 3D printing is the result of the activities of user communities; it represents a bottom-up development that is now being taken up by market actors." (p. 151). These cases involve different sets of actors, institutions, networks and expectation, according to Alvial-Palavicino (2016), these examples embody different forms of "doing 'techno-science." While both are hyped, they embody different practices of anticipation. Alvial-Palavicino (2016) argues that "while it seems intuitive that different actor groups, such as scientists versus venture capitalists or industries, would engage in different forms of anticipation, it is nevertheless important to analyse the conditions that enable different practices to take place in each case." (p. 156). Within the 3D printing case, different groups of actors came together, "where the interests of hackers, makers and industrialists met, practices change and new ones emerge." (Alvial-Palavicino, 2016, p. 156). Alvial-Palavicino, (2016) argues for the importance of the dynamics in anticipation, aka, the relationship between a diverse set of practices, their contest and the evolving relationship between the two. The anticipation practices are unique between the cases of graphene and 3D printing, and of course unique again when looking at transhumanist future visions and their material implications and assemblages.

Tutton (2017) examines the relationship between material and meaning, by arguing for the need to examine meaning and matter in an entangled relationship, as opposed to the taken for granted assumption that matter follows meaning. In critiquing previous conceptualizations of this

relationships, Tutton (2017) points to Heidegger's (1954) standing reserve, and Adam and Grove's (2007) latent futures, as taking for granted the process of meaning proceeding matter.

> One problem with this version of matter and meaning is that it implies a process whereby matter precedes meaning – a latent material process becomes meaningful only after a certain time and presumably under certain conditions. Arguably, what this overlooks is how other meanings – for example, that the future is a 'resource' to be exploited for the gain of those living in the present or that Nature is inexhaustible – might be at work and are deeply implicated in the emergence of such latent processes … Rather than seeing meaning as following from matter, I stress how matter and meaning are entangled with each other. (Tutton, 2017, p. 486)

Tutton (2017), argues that the meaning of matter or the material, cannot be thought of as secondary to its meaning. Therefore, throughout this project, namely in chapter 7, I examine the material implications of transhumanist visions, by analysing the narratives and material aspects in which non-transhumanist actors in technological fields discuss present and speculative technologies.

The materiality of expectations have temporal aspects. When I analyse materiality in this way, I am referring to the way expectations and their materialization change and evolve over time. Konrad et al. (2016) argue that a primary concern in the sociology of expectations are the temporal patters or dynamics of how expectations change over time. Tutton (2017) argues that these temporal dynamic patterns of expectations add a further level of uncertainty to future visions. "The timescale over which futures unfold adds a further complication since what might appear relatively benign over a 50- to 100- year duration, might become far more pernicious over a much longer time." (Tutton, 2017, p. 487).

The hype cycle within collective expectations would be indicative of a dynamic temporal pattern, according to Konrad et al. (2016). Hype cycles, also referred to as promise requirement cycles, exemplify dynamic temporal patterns because the cycle involves a dynamic process where

investment is garnered through promises, that are generally known to be over-hyped. Brown et at. (2003) argue that because high expectations are needed to garner funding for innovation, disappointment is essentially built into the way expectations operate within science and technology. Brown et al. (2003) argue that the cycles of expectations and frequent disappointment has led to serious costs in terms of reputations, misallocated resources, and investments.

This type of dynamic temporal pattern then begs the question of how actors reflect on successful and unrealized future visions, or how actors retrospect prospects (Birch, 2023; Brown & Michael, 2003; Konrad et al., 2016). Even while knowing that expectations frequently end in disappointment, it may still be difficult to give up hope for the future. (Brown et al., 2003; Konrad et al., 2016) "Nevertheless, it remains difficult to see whether - this time – our high expectations might be justifiably warranted." (Brown et al., 2003, p. 1). Konrad et al. (2016) argue that in order not to threaten current, and I argue future, promises, the reason for failed past visions become rationalized.

2.6.4.2 Social and Financial Investment

Investment, both social and financial are key theoretical concepts in this project. In many ways these two concepts are distinct but not completely discreet. According to Birch (2017), "expectations are 'generative' in that they provide direction, legitimation, and create interest in technoscientific solutions, bridging the temporal distance between current research agendas and future research outcomes." (p. 436). Expectations create interest and elicit investment in the future, for example, different temporal dynamics, such as near-term vs far term elicit different levels of call to action (Michael, 2000). Near-term visions especially, attempt to elicit social and financial investment in order to become successfully materialized.

I use social investment as indicative of collective expectations, wherein there is a shared understanding or 'frame' for the future vision, even though there is a certain degree of flexibility throughout the vision, both between individuals as well as in the way that it may become conceptualized and materialized upon wider social adoption. As Konrad et al. (2016) argue, "the main performative roles of expectations in mobilizing, guiding, and coordinating diverse sets of actors involved in technoscientific fields require expectations which are to some degree common, shared reference points." (p. 466). I rely on this collective identity of expectations when enrolling social investment. Beyond those already interested visions of the future, visions need support to become successful. "[SE's] focus are concerned with how … expectations help mobilize resources in the pursuit of technoscience. However, rather than representing an example of discursive performativity or political-economic regime, the [SE] literature argues that future expectations are constitutive because of their role 'in brokering relationships between different actors and groups' (Borup et al., 2006, p. 289)." (Birch, 2017, p. 436). Expectations within SE broker relationships between actors and individuals, this makes expectations and the social investment surrounding them a vital concept within this project.

Future visions, which in this case study, are often in their pre-application state, where their utility and value has not been demonstrated, Brown and Micheal (2003) argue, are contingent on investment mobilization. Brown and Michael (2003) demonstrate the 'hype cycle' or promise requirement cycle. Future expectations are constitutive, they both shape and are shaped by technological innovation (van Lente & Rip, 1998). However, the ways in which future expectations are constituted depend on the enrollment of both public and private resources (Birch, 2017; Brown et al., 2000). At this stage of garnering investment, hype or promises are at their peak, and generally understood to be over promised. Birch (2017), citing Brown and Michael (2003, p. 13) argues that

"the basic dynamics of the futures market means that expectations are capable of generating enormous near-term share value (with which to conduct research or financially reward research staff), but without any necessary requirement for entrepreneurs to fulfil their longer-term promises." (Birch, 2017, p. 436).

Investment socially and/or financially gives actors a certain a sense of agency over the future, in attempting to mitigate uncertainty. For example, Birch (2023) cites Beckert's (2016) fictional expectations to argue that "fictional expectations – characterized as the stories actors tell – are an important social means to manage the vagaries and unforeseeable outcomes of political-economic uncertainty… Stories – or fictional expectations – help us to manage this uncertainty by providing more than descriptive narratives; they are constitutive or performative" (Birch, 2023, pp. 32–33). Future visions are not simply narrative about what the future may hold but constitute and are constituted by future technological innovation.

2.6.4.3 Mundane Presents

I use the concept of mundane to drill down to the rather banal material conceptualization of contemporary transhumanist and longevity technology. I make this argument, in chapter 7, being cautious not to commit the fallacy of basing future expectations on the present, in that I do not want to make the mistake of not accounting for development outside longevity, or the dynamic temporal patterns of expectations (Konrad et al., 2026). I engage in this conversation with the knowledge that there will inevitably be development of technology in other fields of that may bring about other longevity or transhumanist technological breakthroughs. Additionally, I do not want to commit other fallacies, such as in not considering that these problems are anything but wicked and knowing that they are larger than they appear.

One of the ways in which the future is or becomes enacted, is through the performance of mundane everyday action. I use mundane with a particular enactment of performativity, as according to Tutton (2017), one understanding of future enactments is through the performative activities of everyday practices. Tutton (2017) argues that this representation of performativity is illustrative of the 'ontological turn' in STS.

> It is this understanding of performativity which scholars, associated with the so-called 'ontological turn' in STS (see Woolgar and Lezaun, 2013; Moser, 2008; Mol, 2002), have taken up to move away from questions of representation or knowledge to address the 'way that objects are enacted in practice' (Mol, 2002 in Woolgar and Lezaun, 2013: 326). These scholars are interested in world-making and their insights might be useful for future-making as well. As Steve Woolgar and Javier Lezaun (2013: 326) note, 'material objects [...] should in principle be treated as practical achievements, as qualities also "enacted in practices."' In other words, '"materiality" [...] needs to be understood as the contingent upshot of practices, rather than a bedrock reality' on which meanings are then articulated. (Tutton, 2017, p. 487)

Tutton (2017) argues that meaning matters within the material-discursive enactment of the future. Adam (2005) argues similarly regarding the enacting futures in everyday practices.

> Futures are created continuously, across the world, every second of the day… [and created by] socio-political, legal, scientific, economic and everyday performative, enacting practices. The actions and processes associated with this 'future in the making' are ongoing, producing layers and layers upon layers of past and present futures as well as future presents and pasts. (Adam, 2005, p. 2)

These enactments of what I argue are mundane representations of future making, as opposed to, for example, large scale scientific and technological 'discovery' and innovation are indicative, as Tutton (2017) argues, of the 'ontological turn' in STS. This mundane conceptualization of performativity is indicative of a particular understanding of future making, that aids in a more complex understanding of the performativity of the future, in that material objects and the conceptualization of these objects create futures in the present as well as an understanding that future visions range greatly in scale, from grandiose to mundane and everything in between.

2.6 Potential Pitfalls of the Sociology of Expectations

For the conclusion of this section, the limitations of the sociology of expectations theoretical framework will be explored. As Tutton (2017) concludes, "arguably, there can be no conclusion to a paper on the future." (p. 490). Even with the absence of proof, Selin (2008) argues, sociological studies of expectations have shown that the future-oriented visions maintain some semblance of legitimacy. Legitimacy for futures is therefore gained for future representations through the power of their rhetoric, according to Selin (2008). Not all future visions are equal. "The rhetoric supporting new technologies derives legitimacy from the expertise of those making the claims yet also from the widespread belief in the determinacy of scientific and technological progress." (Selin, 2008, p. 1879). Some visions gain credibility and power, while others don't, Selin (2008) argues, depending on affiliation and alignment with either 'serious' science or on the other hand science fiction. Legitimacy is gained for future representations through the power and legitimacy for those who voice or enact them, as well as the belief in the normative progress logic of scientific and technological innovation. According to Selin (2008), the authority attached to these visions invokes questions of the political nature of promises, hope, and hype.

Similarly, Hilgartner (2015) argues that legitimacy is gained for future representations through visionary leaders of futurist groups, or what he calls sociotechnical vanguards. "These vanguards and their individual leaders typically assume a visionary role, performing the identity of one who possesses superior knowledge of emerging technologies and aspires to realize their desirable potential." (Hilgartner, 2015, p. 34). Therefore, the legitimacy and credibility of the actors making future claims as well as the social and financial investment is what creates legitimacy and therefore enactment around future visions.

According to Birch (2023), future expectations are brought into the present through actor's actions, decisions and practices. Expectations perform through actors' promises, utterances, hype. Legitimacy for future visions is garnered through testimony and affiliation with particular visions. Selin (2008) argues, "since we cannot deal with truth and credibility when it comes to different representations of the future … [SE has] shown that even in the absence of proof, future-oriented testimony maintains some semblance of legitimacy. The simple act of attaching oneself to the short or long term is an act of affiliation …" (p. 1889).

Selin (2008) argues that there are sociological tools that equip scholars to look at futures, yet they do not enable taking the social reality of futures seriously. Selin (2008) argues that sociologists are generally comfortable studying past and present futures, but not future futures. According to Selin (2008), studying future futures presents scholars with problems of method and methodology, and problems of developing theories that are fluid and can account for progress and change throughout the process. Selin (2008) further argues that a historical analysis can always show trends and changes over time, however, looking at the past to predict the future, assumes that the future will look like the past. In the following chapter on methods, I will discuss how to mitigate and/or address the challenges, or potential pitfalls, of studying representations of the future in STS.

Chapter 3: Methods: A Qualitative Case Study

3.1 Introduction

This chapter addresses the methods and methodological underpinning and framing of this research study, which employed a case study with virtual qualitative semi-structured interviews that included snowball sampling recruitment.

To examine transhumanist discourses and their impact on research and technological development, I engaged in a study of the transhumanist movement and its influence through in-depth, qualitative interviews. I approached these qualitative interviews through the framework of a case study, which is best used when research questions as 'why' and 'how,' and when studies focus on contemporary phenomena within its real-world context (Creswell, 2014; Yin, 2018). I analyze my interview data using grounded theory, which relies on inductive reasoning to analyze social processes and relationships. The case study method will be discussed, followed by research and field adjustments based on the feasibility of the study during a worldwide pandemic, then I discuss the research ethics process of this study, followed by data collection, the qualitative interviewing process, data analysis and a section of my own reflexivity throughout this project.

3.2 The Case Study Approach

I chose a qualitative methodological approach for this project because qualitative methods seek to explore meaning that individuals or groups ascribe to a social or human problem (Creswell, 2014). This approach is indicative of the research problem I aim to explore, which focuses on particular future visions of transhumanist social groups. Qualitative research involves emerging questions, where data analysis requires the researcher to work out from particulars towards general themes. Through analysis the researcher will interpret the meaning of the data and the final written report is flexible in style (Creswell, 2014). In that this project focuses on a social phenomenon,

drawing meaning from individual and collective meaning making, qualitative research is appropriate. Creswell (2014) argues that qualitative research is appropriate for those looking to engage in an inductive style of research, where focus is placed on individual meaning as well as the complexity of a situation.

My methodological approach is based in a case study that examines the implications and impacts of transhumanist future visions. Transhumanist future visions are suited to a case study analysis, because of the contemporary phenomenon as well as the individual and collective scale of meaning making of future visions to collective expectations process. Both individual understanding of core values and principles of transhumanism as well as the complexity of implications of these values embedded within future visions are examined within this project, making it ideal for a case study approach. Because future visions impact discourse, decisions, and the configuration of the materiality of said visions, they have a real and important implication within the world. This case study aims to understand the implications of transhumanist future visions.

Selin (2008) argues that "there are two fundamentally different approaches to studying futures – those that rely on predication and those that don't." (p. 1886). There are different methodological choices appropriate for different lenses of future studies. While foresight studies best address prediction, Selin (2008) argues that "STS [relies] on more traditional social science tools of interviewing, ethnographic immersion, surveys, focus groups, and the scouring of source material." (p. 1886). Therefore, this study relies on a case study approach using semi-structured qualitative interviewing of transhumanist actors along with non-transhumanist technological innovators, for empirical data collection.

A case study approach is best chosen because my research questions ask "why" and "how"

and because my study focuses on contemporary phenomena, aka, a "case," as opposed to, for example, historical events in which the researcher has little to no control over behavioral events (Yin, 2018). The case study approach will allow for a mixed methods approach, involving mainly semi-structured qualitative interviewing. Yin (2018) argues that the case study as an empirical method allows the researcher to "... investigate a contemporary phenomenon (the "case") in depth, and within its real-world context, especially when the boundaries between phenomenon and context may not be clearly evident." (Yin, 2018, p. 15). The case study, therefore, has been chosen, as opposed to methods such as experiments which separate phenomenon from context, historical research, which is *non*contemporary, or survey which struggles to limit the amount of data points to be collected, aka, struggles to limit the number of items on a questionnaire. Because transhumanism is a contemporary philosophical worldview, with both present and future technological visions and goals, wherein the context and phenomenon cannot be separated from one another, a case study is the ideal approach.

I use an embedded single case study design. According to Yin (2018), a single case is chosen with the rationale of studying an unusual case. Yin (2018) argues that "a rationale for a single-case arises when the case represents an *extreme* or an *unusual* case, deviating from theoretical norms or even everyday occurrences." (p. 50). As I am studying the future visions produced by niche social groups whose future technological visions are grandiose and involve extreme forms of bodily modification, this case represents an extreme of unusual case. As per Yin (2018), studying an unusual case is a common research strategy in that the findings may offer insight about normal processes. In this sense, Mali (2016), argues that future visions challenge aspects of our present, in that they offer alternative possibilities to what is popularly imagined. This single-case study is embedded as opposed to holistic in that it involves multiple units of

analysis, aka, questions pertaining to future visions arising through three future lenses: discourse, decisions and materiality.

According to Yin (2018), potential challenges to a case study approach include a lack of generalizable data, an unmanageable level of effort, and a perceived lack of scholarly rigor. Because case studies deal with one (or a limited number) "case" there is an apparent lack of generalizability. Yin (2018) counters however, that the concern of lack of generalizability could similarly be voiced over scientific experiment, however, generalizable data is not taken from one single experiment, but taken from multiple experiments that have replicated the same phenomenon under different conditions. Yin (2018) argues that like experiments, case studies are generalizable to theoretical propositions and not to populations or universes. In adopting a case study approach, the goal of this project is to expand and generalize theories (analytic generalizations) and not to extrapolate probabilities (statistical generalizations) (Yin, 2018).

Within this case study, this project involves three different areas of analysis, discourses, decisions, and materiality, based on data collected from two different networks of actors, transhumanists and non-transhumanist actors. I focus on these three areas because, methodologically, "the future" can be studied through these three different lenses: discourses, decisions, and materiality (Selin, 2008). This project analyzes all three aspects of the future as they relate to expectations and transhumanist future visions.

The first stage of this project aims to identify what kinds of future expectations underpin transhumanist future technological visions. I will examine transhumanist core values by interviewing transhumanist actors as well as examining secondary literature from transhumanist research institutes and initiatives in order to analyse their influence on technological innovation. The second stage of this project aims to examine how transhumanism visions inform present

decision making, in order to understand how future expectations in transhumanist narratives influence society. In stage three I will analyse how transhumanist future visions become configured materially, in order to understand how future visions within transhumanist narratives influence society.

3.3 Research and Field Adjustments

My methodological choice for this project was informed by theoretical and practical choices that I encountered during the time of this research. One challenge arose in defining the boundaries of this project. While I set out to focus on the impact of transhumanist future visions surrounding AI innovation, my findings facilitated that I broaden my scope to technological innovation as opposed to specifically AI. My initial research demonstrated that AI technologies would be the main focus of transhumanist narratives, because the research codes of ethics surrounding the types of biotechnologies that some transhumanists envision make these types of experiments currently impossible, as discussed by Steve Fuller on episode 3 of the FUTURES podcast with Luke Robert Mason (2019). Therefore, the ethical and policy restrictions surrounding AI innovation are not as strict as those surrounding some biotechnologies, as envisioned by some transhumanist visions. However, I did not find AI to be the main focus of data collected by transhumanist interviewees. While many interviewees had strong opinions when I asked about AGI or superintelligence, many focused on a plethora of topics and visions. Therefore, I broadened the scope of this project beyond the limitation of AI technologies, focusing instead on visions surrounding the the broader concept of technological innovations, which of course, includes AI innovation.

The fieldwork for this project took place between summer 2021 and summer 2022 which meant that travel restrictions and social distancing as well as York University's guidelines and

regulations for human participant research during the global COVID-19 pandemic prevented me from executing interviews in person, in places such as San Francisco, Boston and various locations in Arizona. Therefore, I adjusted my methods and took advantage of the York University [sponsored] virtual communication platform Zoom to conduct and record interviews remotely and virtually. While I initially worried that virtual interviewing would hinder intimate and generative conversations, I did not find this to be the case. Virtual interviewing allowed me to not only access actors from around the world, but something also that would have been financially prohibitive for in person interviewing.

Based on virtual interviewing, the physical boundaries of this project were able to expand because I was not limited to only actors in North America based on my existing network. Although I set out to interview Singularity affiliates, my snowball sampling technique worked well, therefore I expanded my network and gained access to actors across North America as well as Europe. Through this approach, I ended up casting a much wider net and getting a more diverse sample of transhumanist actors, giving me at once a much broader perspective of transhumanism overall and sharpening my perspective to the multiplicity of those engaging with transhumanism.

While the transhumanist network was opened extensively due to remote interviewing, I also set out to interview key investors and decision makers in order to understand how transhumanist visions inform investment. While I was able to gain insight on social and financial investment from both transhumanist and non-transhumanist actors who were interviewed, I was not able to gain access to actors such as policy makers, investors, or decision makers. This did not negatively impact my study as I gained more than sufficient data for my research objectives from those who I did interview.

3.4 Research Ethics

As this project involves research interviewing human participants, before data collection involving participants, this project was thoroughly reviewed and approved by York University's Office of Research Ethics. My research design conforms to York University's 'Research Ethics Protocol' for minimum risk research, which meets the standard of the Canadian Tri-Council Ethics Research Board. All University-based research involving human participants is subject to an ethics review process, which adheres to the *Senate Policy for the Ethics Review Process for Research Involving Human Participants*. The *Senate Policy* review procedures adhere to the Tri-Council Policy Statement (TCPS) guidelines, which include the Canadian Institutes of Health Research, the Natural Sciences and Engineering Research Council, and the Social Sciences and Humanities Research Council.

Interviews were initiated only once interviewees read and signed off on my Informed Consent Form, consisting of information regarding the purpose of the research, what was expected of interviewees, confidentiality protocols and ethics approval.

Potential risks to any participants involved in the study include a potential risk to privacy because using zoom in order to conduct interviews provides a potential risk to privacy. This study used Zoom to collect data, which is an externally hosted cloud-based service. When information is transmitted over the internet privacy cannot be guaranteed. There is always a risk that an informant's responses may be intercepted by a third party (e.g., government agencies, hackers). Further, while York University researchers will not collect information or use IP address or other information which could link your participation to your computer or electronic devices without informing you, there is a small risk with any platform such as this of data that is collected on external servers falling outside the control of the researcher. Alternative arrangements will be

offered if privacy through zoom is of concern, such as a telephone interview. All data collected from interviews will be saved in a password protected file on an external drive.

Maintaining the safety of participants has been of key importance throughout this project. Protecting the privacy and confidentiality of participants is a standard requirement for projects with human participants under the institutional ethics review boards in Canada. This study presented unique challenges in anonymizing transhumanist actor's interview data.

The transhumanist community, particularly the English-speaking community throughout Canada, the US and the UK is a relatively small community within which members are intimately familiar with one another's work and opinions. Many of the transhumanist interviewees are public figures who have published their thoughts and ideas formally or informally. This makes anonymizing their ideas somewhat difficult, as particular actors are known for specific ideas and arguments. While I have no doubt that some of the information that I have used throughout this project will be identifiable to members inside of the transhumanist community, I have done my best to anonymize data to the best of my ability and made difficult decisions over what quotes to include or not include based on identifying arguments and views. While many transhumanist actors stated that they did not choose to remain anonymous, I have all kept interviewee data anonymous for both consistency's sake, as well as to carry out this project out in alignment with the ethical standards of academic research in Canada.

3.5 Data Collection

In order to find interviewees for this project, one of the first things I did was create a Linked In profile in order to be able to identify transhumanist actors, and in an attempt to track networks through associated members accounts. I chose Linked In for its associated professional and workplace networking. I also wanted potential interviewees to be able to see my professional

account that gave them some idea of what I was working on as well as who I was affiliated with, being York University.

While I had an understanding of some of the key themes and debates within transhumanism, based on my prior bachelors and masters work concerning the singularity social group, data collection for this project began with purposeful sampling. I read popular journal articles, from sources such as Wired, New York Times, or the Singularity Hub, as well as publications, such as the Institute for Ethics and Emerging Technologies and the Center for Humane Technology sub stacks. Additionally, I listened to technological and transhumanist specific podcasts, such as Luke Robert Mason's FUTURES podcast and the Radical AI podcast. These publications and podcasts provided context and familiarity on the current debates in the field of AI and technological innovation as well as to look for key participants in the field in order to facilitate interview invitations.

Through the plethora of sources already mentioned, as well as google searches, I began identifying notable transhumanist actors and transhumanist associations/institutes and compiled a list of potential interviewee candidates and began tracking down email addresses for individuals through personal websites, Linked In, or other associated institutions and affiliations.

Informants were recruited through targeted emails. I sent out an initial contact and followed up a week later if I had not heard back. Often, the second contact was more successful than the initial reach out. Snowball sampling worked very well within the network of transhumanist actors, where almost all participants suggested other actors to reach out to. I not only received direct contact information from many interviewees for other transhumanist actors, but this made my need for engagement on sites like Linked In much less critical.

Snowball sampling, however, did not work well amongst non-transhumanist actors, where much less of a connected network existed, if at all. Regarding non-transhumanist actors involved in technological innovation or adjacent fields, I received scattered responses and little to no recommendations from others they knew that might be interested in having similar conversations with me. Ultimately within this sample, there was nothing really tying these actors together other than a particular qualification adjacent to technological innovation. Even when I asked the transhumanists to recommend non-transhumanist actors, I received little to no reply. This was indicative of the request for non-transhumanist actors as either framed too broadly, or not reflective of the impact, or lack thereof, that transhumanism has had on technological innovation.

Data collection for this project was conducted through qualitative semi-structured interviews and field notes along with audio and video recordings taken during the interview process. I conducted and recorded the interviews through Zoom, a virtual communication platform. Transcripts were recorded through zoom during the interview which utilizes natural language processing. Transcripts were reviewed thoroughly for accuracy following interviews. Interview material and transcripts were stored on my password protected personal computer.

3.6 Qualitative Interviews

I conducted 25 semi-structured in-depth qualitative interviews over zoom. Although interviewees were also offered telephone interviews, none chose this option. Interviews were scheduled for 1 hour, however, most interviews exceeded an hour, with the average interview lasting roughly 90 minutes. The purpose of the interviews was to gain deep insight along with personal perspective and passion that cannot be gained from secondary sources.

I interviewed 14 transhumanists or actors very closely associated with these future visions, which included academics, activists/spokespersons, politicians, religious leaders, and

technologists. Under the category of transhumanist actors, I contacted 26 potential interviewees, aside from the 14 interviews that I conducted, I received 3 declines, 6 no responses after an initial contact and a follow up a week later, 2 people who had agreed to be interviewed, however, throughout communication became difficult to track back down and were not interviewed, and 1 actor of whom I declined to interview upon conducting background research on this individual. The response rate, therefore, of transhumanist actors was quite high. I attribute this success to not only the small community but also the snowball sampling style and recommendations, often with direct contact information provided by some actors of others. The purpose of interviewing transhumanists was to identify the future expectations that underpin transhumanist future technological visions, as well as how these narratives are taken up within society.

Additionally, I interviewed 9 non-transhumanist actors, which included specialists in technology, philosophy, and science. The response rate within this category was much lower than with transhumanist actors. I contacted 27 actors, 9 of which I interviewed, receiving 13 declines, most citing being too busy, and 5 declined responses after an initial contact and follow up email 7 days later. I attribute this lower acceptance rate as indicative of this project focusing specifically on transhumanism as a social group, therefore the purpose of non-transhumanist actors' opinions may not have been clearly laid out to participants. Some that I contacted did not feel qualified to make the types of statements they thought I was looking for. I found it difficult to target these actors specifically, in that these actors did not come from a specific social category and therefore snowball sampling within this category of participants was almost non-existent. The purpose of interviewing non transhumanist actors in adjacent fields was to both identify how transhumanist narratives impact society and technological design as well as how transhumanist future visions become configured materially.

Interviewees were contacted by email and were provided the ethical standards of this research project, the interview questions and some background on the research project on initial contact. Interview questions were grouped by theme beginning with general information about the interviewee, such as their current and past careers. I followed with questions which included topics that included past, present and future influences and visions, existential risk, religion and transhumanism, AGI or superintelligence, and what the future looks like. Interviewees were asked open-ended questions, starting with questions specific to them, such as what they do for a living and how they got into the field they are currently in. These types of questions were generative, in that it not only put interviewees at ease, in that talking about themselves and their career paths was not intimidating as well as, in many cases, generating rich historical data about the history of the transhumanist movement. While the interview schedule was provided to interviewees prior to the interview, I was not strict with asking questions in a specific or prescribed order. While some interviewees were comfortable with a more traditional question and answer format, others were more conversational, and I attempted to balance asking my primary research questions along with the flow of an organic conversation. All interviews ended with a final question posed, where I asked interviewees if there was anything else they wanted to include, had I missed anything important or obvious, or was there something I should have asked and didn't. This question left room for interviewees to include anything they felt was important that I had overlooked.

Interviewees largely consisted of middle aged to senior white males despite my best efforts to include diversity within this project. This demographic is indicative of the population of whom I studied, which is further indicative of the gender inequality in STEM fields.

3.7 Data Analysis

Data analysis began with thematically coding data. NVivo 12 and NVivo 14 were used as a coding management system in the thematic coding process of data analysis. Once transcripts were painstakingly edited by watching recorded interviews, any identifying information was removed, and transcripts were uploaded to NVivo.

Mixed methods were used for coding and analysis of interview data. The analysis and coding began with a content analysis approach, wherein some codes were developed before coding began. Here codes were based on the framing of the research questions (abstract) mainly, and partly from the research questions (more concrete to get more detail on certain issues, drill down) (Adu, 2019). The coding process also involved a thematic or grounded theory (inductive) approach, wherein I also generated codes from what I was analyzing in the data (Adu, 2019).

For the first pass of coding, I engaged with a descriptive coding strategy, wherein I acted as a journalist, reporting on what the data was telling me. Here I engaged in bracketing, meaning an attempt to acknowledge and set aside my pre-conceived notions about what may appear in the data, or what I previously thought the data might contain (Adu, 2019). In this first pass of coding, I allowed myself to see the data with fresh eyes and coded thematically by what I saw emerging.

My second pass of coding involved re-reading interviews with the previously created codes as well as new codes in mind. New codes included anchor codes which are associated with the research questions I was addressing. Here I was able to look for and create relationships within and between codes, aka, code relationships in NVivo. I identified relationships between topics, such as when transhumanist history is spoken about there are always one of two very specific examples that are used to illustrate the argument, which is indicative of particular cannon within transhumanist internal narratives.

My third pass of coding focused on interpretation. For this pass, I was looking at codes and coded excerpts in an analytical way, for example, examining how future expectations are framed by transhumanist visions. At this point in the coding process, I began to think about important and dominant narratives in regard to guiding the analytical chapter outlines while also addressing the research objectives and questions. Then I began structuring chapters with coded information to provide the basis of examples regarding selected topics.

The analytical process of making sense of coded themes and sorting them into a coherent argument was not a straightforward process. The more I learned from transhumanist interviewees about what they consider transhumanism to be, the less I felt I knew about what the boundaries of the term contain. 'Transhumanism' is a contested term that holds a variety of meanings which makes definitive statements about transhumanism difficult to construct. The messiness of the research process has revealed a multiplicity of meanings of the term as well as ways of being transhumanist. As Law (2004) argues, when social scientists attempt to "describe things that are complex, diffuse and messy" (p. 2), the description and answer to research questions is undoubtedly messy. Law (2004) argues that "simple clear descriptions don't work if what you are trying to describe is not itself very coherent. The very attempt to be clear simply increases the mess." (p. 2). As I discovered through research, data collection and analysis, unpacking a social phenomenon like transhumanism is undoubtably messy. My attempts to make clear and concise what transhumanism is or what transhumanists say, leaves a certain sense of unease and further attempts to clarify.

The two main components of this project are both quite messy, in that studying futures, as Tutton (2017) qualifies them, are wicked problems. Wicked problems are indicative of large scale social systems problems, where information is not clear, ill formulated, and confusing, there is

little consensus about how to solve problems because of conflicting values, therefore wicked problems are never fully solved, but only re-solved over and over again (Tutton, 2017). The future is speculative, and therefore articulating analysis definitively on futures is messy. As Tutton (2017) argues, "Arguably, there can be no conclusions to a paper on the future." (p. 490). However, legitimacy is gained for future visions in two ways: by the credibility of the speaker who gives the testimony of the visions, as well as in the actions that are taken towards particular future visions to bring them about (Selin, 2008).

The social phenomenon of the transhumanist movement, which has become clear across my research are transhumanist movements, are also tricky to define. The meanings, values, and goals amongst transhumanists are vast. Therefore, describing anything as definitively transhumanists has been challenging.

Therefore, framed by a sociology of expectations theoretical framework, this study aims to provide an analytical analysis of transhumanist future visions and their implications in society. I do this by analyzing empirical data from a multiplicity of stakeholders within the broad conceptualization of technological innovation.

Within analytical terms, I relied upon transhumanist interview data gathered as both primary and secondary data. By this I mean that because of transhumanist expertise has liminal boundaries, I used their narratives and core values in to order to analyze their understanding of the world in which they represent it, which enables me to understand in which ways transhumanist narrative have impact.

3.8 Reflexivity

This study is situated in a social constructivist epistemology, in that it seeks complexity in understanding individual subjective experiences. The goal of the research project is to rely on

participants' views, therefore interview questions remained broad and open ended, so that participants could construct their own meaning of the question. This study is inductive, in that it seeks to make sense of the meanings others have about the world and work towards a theory based on interpretation of the data, as opposed to working to prove or disprove a theory (Creswell, 2014).

Creswell (2014) argues that subjective meanings are derived socially and historically and formed through interaction with others, and that subjective meaning is formed through cultural and historical norms. An understanding that subjective perspectives of the world are formed through cultural and historical norms and the cultural and historical norms are formed through collective interaction is a foundational understanding for this research project. Conceptually, however, cultural norms are broad and multiple, one group's social norms may conflict or be very different from another. This study aims to understand the specific context in which participants live and work, in order to understand the historical and cultural settings of the participants (Creswell, 2014). As a constructivist researcher, I do my best to account for and recognise how my own position, background, and subjective being shape my interpretations.

Finally, I am grateful to all the participants who gave their time to this project. The Executive Director of Humanity+, Natasha Vita-More (2009) describes that one of the benefits for academics or those interested in transhumanism, is that the pioneers of this philosophical worldview and social movement are still living.

> The philosophical worldview and social movement of transhumanism has the benefit of existing while many of its pioneers are still living. This makes it more accommodating for those unfamiliar with transhumanism to investigate and argue its tenets with the most recent writings at hand … researchers can easily locate people through Google and send an email or make a call. (Vita-More, 2009, para. 2)

With this in mind, I have done my best to represent and analyse transhumanist visions and discourses accurately and fairly, while maintaining academic integrity. This project has maintained

scholarly rigor in upholding transparency, in being open and honest about the limitations and potential biases within this research project, maintaining reflexivity throughout the project and not just as a final point on the project, as well as maintained both academic and ethical integrity maintaining alignment with the ethical research standards set by York University's Office of Research Ethics.

3.9 Limitations of the Study

This section addressed limitations of this study, including what my data collection and analysis could and could not represent based on the approach and worldviews of my interviewees, limitations of the methods of studying future representations, as well as the generalizability of the case studies within this project. I conclude this section and this chapter by discussing my passion and my therefore the potential limitation of my critical distancing within this project.

Selin (2008) warns of the potential political pitfalls for scholars studying future representations. In looking at the future, Selin (2008) argues, social scientists have a particular set of qualities to strive for, such as neutrality and transparency, while also keeping temporality and power relations in mind.

> Social scientists as practitioners have the additional role to question who's legitimating what, to look into questions of winners and losers, and to become curious about what's being bought, sold, and traded in the future tense. Social scientists should tend to the cultural, political, and economic conditions from which future studies arise. What these visions articulate, how they do so, and to what effect are all ripe for inquiry… social scientists have more value not as futurists per say but as scholars seriously interested in the future and responsible for asking how it is constructed, by whom, through what means, and with what consequences. (Selin, 2008, p. 1889)

The difficult task for social scientists is that they are often asked to make predictions of the future. Or in other words, Selin (2008) argues, they are asked to perform the role of futurists or foresight practitioners. According to Selin (2008), STS scholars maintain that technologies are a

part of our social and cultural spaces and should therefore be scrutinized during early stages of development to ensure beneficial outcomes for the public with minimal risk. However, Selin (2008) warns, that this kind of inquiry, "… immediately throws social scientists into and at the future and in the center of politics." (p. 1890). The field of expectations studies is rich with "dilemmas and delights," and that as social scientists begin to take account of futures, special attention needs to be paid "to the politics of such rendering." (Selin, 2008, p. 1892).

As a scholar who studies future representations, I have been asked, many times, to play the role of futurist and make predictions. To the best of my ability, I have maintained a boundary between myself, the scholar studying those who speak about future representations, and those actors themselves. I am not a member of the social group I am examining within this case study, and therefore have done my best to maintain a professional boundary between myself and my interviewees during this project. I experience the crossing of this boundary more so in the presentation of this work, through the curiosity of others, who wish to place me in the role of foresight practitioner rather than expectations analyst. This project addresses the impacts of technological future narratives, and therefore focuses on questions of how that future is constructed, as opposed to making predictions. I have rigorously aligned and maintained alignment throughout with the ethical standards of the York University Research Ethics throughout this research project.

A further limitation of this project is the generalizability of the case studies, which is a common critique of case studies within the field of STS. In the lack of generalizability of the case studies themselves, I have contributed to the field both in a theoretical and methodological way, which I further discuss in the conclusion of this study.

Finally, based on the methodological choices for this study, focusing mainly on qualitative semi-structured interviews with transhumanist actors, I acknowledge some limitation that this method elicits. Because I spoke to transhumanist actors for first-hand accounts, there is a clear lack of criticality about their worldviews coming from informants themselves. What the worldviews of my interviewees reflected and what may not have been reflected are therefore a limitation of this approach. My data primarily covered transhumanist narratives and core values, therefore largely absent are biases or problematic issues within these narratives and values. Although some informants were highly critical of one another, it is obvious that they would not be highly critical of themselves and their own worldviews, therefore I consider that the data I collected for this project is absent of problematic areas and biases within transhumanism and is therefore one of the limitations of this project.

This type of limitation or erasure of biases or blind spots is particularly important to keep in mind within chapter 4, which these issues do not appear within the self-reported history of transhumanism, therefore this chapter is absent of issues of erasure of racial, gender or class dynamics because of the nature of the self-reported historical accounts.

While my passion and curiosity for futures and the potential for the technologies that may change all our lives significantly often shines through, I have done my best to maintain a critical and scholarly distance from my interviewees and with the project. While I am not a transhumanist and do not subscribe to transhumanist worldviews, I maintain an enthusiasm for this blend of philosophy meets futurism meets technological solutionism that I find endlessly fascinating, although not unproblematically. Although I am not uncritical of transhumanism, these critiques have not been fully captured within the scope of this project based on the transhumanist worldview that was captured.

Chapter 4: A Transhumanist Self-History

4.1 Introduction

In the previous chapter I discussed the methods and methodological framework for this project which uses a case study method that included semi-structured qualitative interviews with transhumanists as well as scientists and technologists. These methodological choices were informed by the theoretical concept of the sociology of expectations from STS which were discussed in chapter 2 and 3.

In this chapter, I provide a brief, descriptive and by no means exhaustive narrative literature review of the self-history of major developments within transhumanism, as told by transhumanists from empirical evidence derived from interviews. This purpose of this chapter is to provide context before examining the implications of transhumanist discourses in the following chapters. This chapter examines some of the major moments throughout transhumanism as described to me by transhumanist actors during interviews and bolstered by secondary sources from both transhumanist actors as well as non-transhumanist academic analysis that engage with these topics.

Transhumanist history can be traced through a mix of academic sources, transhumanist texts, and public discourses from non-transhumanists, such as newspaper articles. I used this mix of literature to corroborate each other and to ensure that I had captured a thorough understanding of the major transhumanist historical events. Because transhumanism was formalized in the 1990's I had the privilege of speaking to some of the founding and important members of this community, gaining insightful oral histories, which I use in this chapter to trace how transhumanists understand their core values and the historical developments that have create transhumanism.

I present a self-told history here, not to draw a distinction between subjective and objective historical evidence, but to provide a unique perspective in presenting this chapter through the

words of informants to tell the story of their own historical narratives, core values and principles. The self-telling of transhumanist values is important to include for many reasons, primarily being that transhumanist actors themselves do not always occupy clear boundaries between interlocutors/participants within this project, and hold expertise within theoretical, intellectual and institutional capacities. Therefore, rather than offering something like a claimed objective or neutral history, this chapter offers a unique position in following transhumanist claims about how core values and principles have come to shape the formalization of transhumanism as it is known today.

As important as the self-reported history is to present here, I also acknowledge the limitations of this approach and therefore the erasure of certain aspects of information within this chapter. Because I focus here on self-reported transhumanist worldviews, there is little in the way of serious critique of biases and blind spots within this worldview, within this chapter. Transhumanism, and technological enhancement more generally can be seen as problematic because of the way in which it erases human capabilities. Technological enhancement can be seen as erasing certain disabilities, and frame race and gender in ways that have very particular political and social implications. For instance, transhumanist politics, can be generally said to be masculine and heteronormative, however, this is not necessarily the political agenda that transhumanist actors will state outright. This chapter is important for this representation of self-told transhumanist history, but also represents the missing context of a self-told history which contains the absence of blind spots such as racial, class, and gender erasures and biases.

This chapter begins by examining transhumanist historical narratives and historical influences, described as proto-transhumanism. Additionally, I follow transhumanist narratives through historical religious underpinnings and influences, followed by a brief discussion of the

contemporary relationship between religion and transhumanism, as understood by transhumanists themselves. Then I provide a brief timeline of contemporary transhumanist politics, research projects, and major research institutes, based on the empirical data provided by transhumanist actor interviewees, as well as transhuman literature and academic literature focused on transhumanism, of which there is relatively little.

4.2 Historical and Religious Influences

4.2.1 Introduction

To provide context for the subsequent chapters, this section follows transhumanist influences and historical narratives, as understood by transhumanist actors, regarding early uses of the term, which include influential historical and religious figures such as Nikolai Fedorov and Pierre Teilhard de Chardin. I followed with a discussion of the contemporary transhumanist commentary on the relationship between transhumanism and religion in order to demonstrate the tension between the dominantly secular position of contemporary transhumanism despite its influential religious underpinnings. This section relies on both scholarly publications, popular transhumanist publications, and empirical evidence from this study.

4.2.2 Etymology of 'Transhumanism' and Entanglements with Religion

There is an ongoing debate surrounding who coined the formalized or modern definition of transhumanism. 'Transhumanism' has been coined independently, with different meanings, multiple times throughout history before an explicit rendering of what constitutes 'transhumanist' type activities solidified in the late twentieth century (MacFarlane, 2020; More, 2013a). The etymology of transhumanism is tracked through both transhumanist literature as well as academic accounts written by non-transhumanist actors on transhumanist history. Transhumanist historian,

Bohan (2018), argues that the solidification of the term is, to a certain point, open to personal interpretation, depending on one's definition. Many transhumanists argue for the formalization of transhumanism in the early 1990's and thus I will consider this the case. Bohan (2018) argues more exactly, that while "Max More and Tom W. Bell co-founded the first official transhumanist magazine, *Extropy*, in 1988, which was tied to the first official transhumanist movement, extropianism, [Bohan] date[s] the official emergence of transhumanism as a philosophy and movement to 1990 because this is the year that first philosophical documents outlining core transhumanist tenets were produced." (Bohan, 2018, p. 11).

Before the formalization of transhumanism in the 1990s, the term was used in a plethora of historical examples, which all describe a transformational state for a human or humans, however not always used within the technological transformational state as transhumanism is understood today. The first recording of the word transhuman is religious in context, appearing in Dante Alighieri's *Divine Comedy* (1312), which was translated into English in 1814 by Henry Francis Carey: the term is used in the context of passing beyond a human body while ascending into the sphere of heaven (More, 2013a; O'Gieblyn, 2017; Vita-More, 2019). This use denotes a spiritual transformation, as opposed to a technological or physical type of transcendence, which the modern term connotes.

Centuries later, T.S. Eliot used the term 'transhumanized' in *The Cocktail Party* (1949), in which the context was not of a technologically mediated transformation but of 'illumination' in relations to human suffering before a transformation or illumination (More, 2013a; Vita-More, 2013, 2019). Pierre Teilhard de Chardin's, *The Future of Man* (1959) also discusses 'transhumanizing' in the context of fulfilling human potential (Bohan, 2018; Vita-More, 2019). Bohan (2018) argues that "Teilhard de Chardin also employed a number of very similar terms to

transhumanism, with similar connotations to the modern term, in the mid twentieth century." (p. 343). Additionally, Bohan argues (2018) that "I have not found any other sources on the origins of transhumanism that acknowledge this." (p. 343). I, however, had many interviewees speak to the importance of Pierre Teilhard de Chardin's influence on modern transhumanism, which are examined below. Writer O'Gieblyn (2017) argues that "transhumanists have acknowledged Teilhard and Fedorov as forerunners of their movement, but the religious context of their ideas is rarely mentioned." (para. 12). Therefore, I argue that a tension arises, in that although transhumanist literature accounts for the influences of figures like Teilhard de Chardin and Fedorov, their religious influences are often overlooked or discussed anecdotally or not at all.

The first recording of the word transhuman is religious in context, appearing in Dante Alighieri's *Divine Comedy* (1312), the term is used in the context of passing beyond a human body while ascending into the sphere of heaven (More, 2013a; O'Gieblyn, 2017; Vita-More, 2019). The context of use here illustrates the Christian resurrection, describing the moment that the dead will rise, and the living will be granted immortality. Although Christian prophecies generally evoke the supernatural, or that God will bring about the resurrection, as argued by O'Gieblyn (2017), "since the medieval period, there has also persisted a tradition of Christians who believed that humanity could enact the resurrection through science and technology." (para. 9). The Christian figures O'Gieblyn (2017) points to include Roger Bacon and Nikolai Fedorov. These types of beliefs, resurrection or transcendence through science and technology, are therefore not new, and foreshadow transhumanist ideals and visions. Roger Bacon, often considered the first western scientist, was a friar and alchemist in the 13th century, who tried to develop an elixir of life that would mimic the effects of Christian resurrection (O'Gieblyn, 2017). Bacon illustrates what O'Gieblyn (2017) is arguing, that the search for transcendence through scientific and technological

means persists from the Christian ideal of resurrection. I am arguing, therefore, that, although considered by many to be secular, the quest for transcendence through technological means, or what is considered modern transhumanism, takes inspiration and has entanglements with religious ideals.

Further influence on transcendence comes from the European Enlightenment in the 18th century which was based upon the values of skepticism, reason, individualism, and secularism as well as notions that humans could be modified or enhanced. Immanuel Kant (1784/1992) argued "*Sapere Aude*![1] [Dare to know!] Have courage to use your own understanding!"--that is the motto of enlightenment." (p. 1). Kant (1784/1992) famously conceived of the Enlightenment as the liberation of human beings, he argued "*enlightenment is [hu]man's emergence from [their] self-imposed immaturity. Immaturity* is the inability to use one's understanding without guidance from another. This immaturity is *self-imposed* when its cause lies not in lack of understanding, but in lack of resolve and courage to use it without guidance from another." (pg. 1). According to Brooks (2020) Kant established the formal basis to think for one's self and to question accepted notions of any field of human knowledge rather than relying on a belief imposed by an outside authority.

Kant (1781/1922) further argues: "All our knowledge begins with the senses, proceeds thence to the understanding, and ends with reason. There is nothing higher than reason…" (p. 242). Brooks (2020) breaks down Kant's contribution when he describes that the Enlightenment brought about both new understandings of the physical world based on the scientific method as well as "applying rational inquiry towards human life and the organization of human society." (p. 351). According to Brooks (2020), the Enlightenment brought about a space where "ideas were now

[1] "Dare to Know!" "(Horace, *Epodes*, 1, 2, 40. [42-30 BCE]). This motto was adopted by the Society of the Friends of Truth, an important circle of the German Enlightenment." note from translation (Kant, 1784/1992).

exchanged between thinkers in a network of learning that itself provided a kind of intellectual momentum." (p. 351). While often criticized for being too individualistic, the concept of humanism that arises from the Enlightenment largely underpins the tenant of contemporary transhumanism.

Despite the influence of skepticism and reason, O'Gieblyn (2017) argues that the Enlightenment only strengthened Christian resurrection prophecies. "If anything, modern science provided more varied and creative ways for Christians to envision these prophecies." (O'Gieblyn, 2017, para. 10). The scientific revolution, which precedes the Enlightenment, serves to provide further paths for transcendence, as argued by O'Gieblyn (2017).

In a foreshadowing to transhumanism, or indicative of proto-transhumanism, journalist and science writer, Dvorsky (2022) argues that during this time period, French philosopher Denis Diderot (1976[1830]) wrote in *D'Alembert's Dream* that "humans might someday redesign themselves into a multitude of types 'whose future and final organic structure it's impossible to predict.'" (Dvorsky, 2022, para. 9). Dvorsky (2022) also suggests that Diderot thought it would be possible to revive the dead, as well as enhance animals and machines with intelligence. Diderot's (1976[1830]) ideas are a foreshadow to both of the major contemporary transhumanist projects cognitive enhancement as well as longevity endeavors, such as cryonics.

Dvorsky (2022), describes Russian cosmism of the late 19th and early 20th centuries, as foreshadowing modern transhumanism. Nikolai Fedorov, a Russian Orthodox ascetic, known as the 'father of Russian Cosmist philosophy,' was the first to think about technological resurrection. According to transhumanist historical discourses, Fedorov is a well-known religious transhumanist influence (Interviewee #2, Interviewee #9). Technological resurrection, a popular idea amongst Mormon Transhumanists today, considers using the means of science and technology to resurrect

the dead from the past. Futurist, transhumanist, Chair of the London Futurists, and author of *Vital Foresight* (2021) and *The Singularity Principles* (2022), David W. Wood (2021) explains technological resurrection:

> Briefly, such a scenario involves beings in the future with the god-like ability to bend space and time, in non-destructive ways. These future beings might be able to reach into the distant past to preserve someone's consciousness at the point of their death (whether they died by illness, by violence, or by accident), in order for that person to be able to continue living, in a different substrate, that we can hardly imagine at the present. (p. 439)

Interviewee #9, a technologist, philosopher and prominent leader within a social religious transhumanist group, described Christian influences on transhumanism when they describe: "For [Fedorov], the technical resurrection was not just something that technology kind of hinted at, but also was something that theology drove his work, Christian theology in particular…" While not all cosmists were religious, Fedorov's ideas were theological in nature, in that they reflect, as Interviewee #2 discussed an important breakthrough between religion and science in that promises of resurrection, like in the Christian religion, could now be considered through the conceptual framework of science, rather than revealed through religion. In what is clearly a foreshadowing of the singularity movement, Interviewee #2 explains Fedorov's philosophy: "Fedorov thought that humans are meant, by God, to take over the universe, moving beyond the Earth, colonizing other planets, [expanding] the biosphere, [etc.]…". By merging the worlds of religion and science, Fedorov aims to achieve God's will through technological and scientific endeavors. Therefore, Fedorov's work lays an important precursor to contemporary transcendent ideas, such as Ray Kurzweil's Singularity theory. Furthermore, Dvorsky (2022) highlights technological resurrection as "a portend to cryonics-a staple of modern transhumanist thinking." (papa. 10).

In the 20th century, Pierre Teilhard de Chardin (1966), popularized the philosophy of the noosphere, along with biochemist Vladimir Vernadksy and mathematician and philosopher,

Édouard Le Roy (Bohan, 2018). The noosphere is a concept that is also grounded in theology and influential to transhumanism. Interviewee #9 discussed transhumanist history and spoke in detail about Teilhard de Chardin. As a foreshadowing and influence of transhumanism, Bohan (2018) argues: "The two Frenchmen [Pierre Teilhard de Chardin and Le Roy] conceived of the noosphere as "a bridge between science and religion"[(Samson & Pitt, 1999, p. 5)] and viewed it as "a predestined process driven by the human phenomenon." (p. 93-94). Teilhard de Chardin (1964) envisioned the noosphere, a philosophical concept that envisions a new type of biosphere that is formed by human kind's rational activities.

Teilhard de Chardin (1964) argued that humans can overcome their present state. At the heart of this change is a particular type of human socialization and connectivity. Teilhard's noosphere foreshadows the internet. Teilhard de Chardin (1964) argued "... the fruit of socialisation, far from being a mere spark in the darkness, represents our passage, by Translation or dematerialisation, to another sphere of the Universe; not an ending of the ultra-human but its accession to some sort of *trans-humanity* at the ultimate heart of things (italics mine)." (Teilhard de Chardin, 1964, pp. 296–297 as cited in Bohan, 2018, p. 343).

Interviewee #9 described Teilhard de Chardin's entanglements between religious ideals informing his futurism, and therefore ideas that eventually inform modern transhumanism.

> Yes, it should be obvious, that it is evident that religion has deeply informed the origins of Transhumanism. Deeply! Examples: … [one] would be Pierre Teilhard de Chardin, who was a French Jesuit priest, so Catholic, and he was also a paleontologist, a formally trained scientist. He was an evolutionist. He believed that humans had evolved from less complex live forms, and also a Christian; and he advocated an idea that he called the Noosphere, and the Noosphere was kind of the next step in the evolution of not only humans, but also the rest of life on earth that would follow on the evolution of the biosphere, and the Noosphere would introduce high levels of connectivity between living creatures where they would have greater access to each other's ideas and potentially thoughts and emotions even. And this dude lived a long time before the Internet but for scientific reasons and religious reasons he foresaw the future

> of humanity and the rest of living creatures on earth evolving towards what he called this Noosphere, this interconnected mind world, and that ultimately this would reach what he called the Omega Point.
>
> He associated [the Omega Point] with the return of Christ and universal resurrection, and that the Omega Point would be when that interconnected Noosphere becomes so thick and pervasive and rich and strong, that all things are part of it; and God becomes in and through all things… This is deeply informed by both his theology and his perspective on the potentialities of evolution. (Interviewee #9)

Interviewee #9 describes that Teilhard de Chardin's identity, as both scientist and Jesuit priest/Catholic, informed his theory of the Noosphere, a concept that foreshadows internet type global connectivity and beyond. Both Interviewee #1 and Interviewee #25 also spoke about De Chardin and the Noosphere. Interviewee #25 is a non-transhumanist actor, who is a global futures researcher, explained that we are working our way towards the concept of the Noosphere.

> … as we increasingly create a technologically enhanced collective intelligence, it also influences our mind. Noosphere is the mind of the Earth. It is like slowly we connect up and then we get to the mind of the Earth. We aren't there yet, but participating in the mind of the Earth, is maybe one functional definition of enlightenment. (Interviewee #25)

Furthermore, transhumanist and writer, Interviewee #1 discussed both their own complicated past with religion and also how these types of transhumanist influences allow them to hold space for those who find compatibility between transhuman values and religion, seemingly two distinct sets of worldviews.

> … I would [not] dismiss anyone who could find spaces of reconciliation between these two sets of beliefs that, on the one hand, you could be this kind of, let's take, Pierre De Chardin, a Jesuit, who at the same time, had no complaints about thinking of the noosphere, the global mind, global brain, mass civilizational interconnectedness. To him that was about as spiritual an idea you could think. Yet he was Christian, you know. So got me thinking, yeah, I don't have any kind of issue with that. If you, if it works for you, you know whatever floats your boat. (Interviewee #1)

The Noosphere reflects Christian ideals as pursued through scientific and technological means. These themes are highly reflected within transhumanism, for example in transcendence,

new worlds with different types of beings, abundance, morphological freedom, or the singularity, however, within modern transhumanism are strongly disassociated from their religious influences.

This history is important to understand, in that it is reflective of the multiplicity of transhumanist visions and goals today. While dominant transhumanist narratives reflect secularism, they are influenced by religious ideals. Michael (2000) argues that these worldviews do not need to supersede one another, science is not modern while myth is anachronistic, they co-exist together and at once.

Beginning to move towards a technological idealization of transcendence, as per Doat and Dorthe (2023) in April 1951, Julian Huxley, coined the term 'transhumanism' in his William Alanson White Memorial lecture, which took place in Washington DC. The term supported the idea that "the human species can, if it chooses, transcend itself…. We need a name for this new belief. […] I believe in transhumanism: once there are enough people who can really say that, the human species will be on the threshold of a new kind of existence" (Huxley, 1951, as cited in Doat & Dorthe 2023, p. 695). Huxley, often considered the 'father of transhumanism,' also wrote a chapter titled "Transhumanism" in *New Bottles for New Wine* (1957), where he describes transhumanism as: "[hu]man remaining [hu]man but transcending [them]self, by realizing new possibilities of and for [their] human nature." (p. 17). Bohan (2018) argues that Huxley's lecture reveals his early ideas for the need of a new social movement, one that is inspired by 'cosmic evolution.' Bohan (2018) argues that "the lecture bears some trappings of proto-transhumanism, as Huxley declared that "the essence of human destiny is thus to introduce evolving life, in the person of [hu]man, to fuller realization and new possibilities." [(1950)]. However, Huxley did not name transhumanism as this new, cosmic evolutionary ideology until the following year." (p. 346).

Transhumanist historian Bohan's (2018) argues that a common mistake has proliferated the particular history of Huxley's coining of transhumanism.

> When introducing transhumanism, many scholars have perpetuated the following attribution error, first made by James Hughes in *Citizen Cyborg* [(2004)]. Hughes credited Julian Huxley as the first person to use the term transhumanism. While Huxley *may* have been the first thinker to use that precise word in something akin to its modern sense, Hughes attributed Huxley's use of the term to his 1927 book *Religion Without Revelation*. Yet the passage Hughes quotes does not appear in this book, nor does the book contain any mention of transhumanism. Despite this, a number of scholars have re-cited this mistake.[ex. (Bostrom, 2005, p. 6; Cordiero, 2014, p. 236)] (Bohan, 2018, pp. 344–345)

Bohan (2018) furthers the argument by highlighting a common history amongst transhumanists themselves:

> Most academics and journalists in recent years have cited Huxley's essay "Transhumanism" in the collection *New Bottles for New Wine* (1957) as the true original source of the term transhumanism. The historian of science and religion, Peter Harrison, and the Chaplain and theologian, Joseph Wolyniak, appear to be the only academics to have pointed out that this is also an error. They trace an earlier use of the term to Huxley's two-part lecture, "Knowledge, Morality and Destiny," delivered as the third William Alanson White Memorial Lecture in 1951 and first published in two parts in the journal *Psychiatry* the same year [(Harrison & Wolyniak, 2015)]. The lecture was subsequently reprinted in the book *New Bottles for New Wine* in edited form. (p. 345)

Finally, Bohan (2018) argues for a possible reason for this confusing and mistaken history:

> A possible reason for some of the confusion over the correct date of Huxley's first use of the term transhumanism is that the book *New Bottles for New Wine* was republished in 1960 as *Knowledge, Morality, and Destiny*, while the lecture "Knowledge, Morality and Destiny" (1951) appears in edited form in the book *New Bottles for New Wine* (1960). This is genuinely confusing. As if that weren't enough, Huxley also delivered a lecture in 1950 called "New Bottles for New Wine: Ideology and Scientific Knowledge," published the same year in *The Journal of the Royal Anthropological Institute of Great Britain and Ireland*. [(1950)]. The term transhumanism does not appear in that lecture… To reiterate, Huxley appears to have first used the word transhumanism in 1951, six years before the essay "Transhumanism" appeared in the book *New Bottles for New Wine* (1957). (Bohan, 2018, p. 345-346)

This clarification and distinction that Bohan (2018) has recorded for the history of the coining of the term transhumanism is important to include here for posterity and historical accuracy as well as to avoid repeating this commonly found mistake.

Vita-More (2013) discusses Huxley's direct influence of Teilhard de Chardin through a shared reference between the two,[2] as well as the potential of influences from T.S Eliot (1949) and Dante (1312), who's work preceded Huxley's. O'Gieblyn (2017) describes Teilhard de Chardin and Huxley as friends, describing that Huxley used Teilhard de Chardin's ideas in his writing, however explicitly removing the religious connotations.

> Huxley, a secular humanist, believed that Teilhard's visions need not be grounded in any larger religious narrative. In 1951, he gave a lecture that proposed a non-religious version of the priest's ideas. 'Such a broad philosophy,' he wrote, 'might perhaps be called, not Humanism, because that has certain unsatisfactory connotations, but Transhumanism. It is the idea of humanity attempting to overcome its limitations and to arrive at fuller fruition.' (O'Gieblyn, 2017, para. 12)

O'Geiblyn (2017) highlights the way Huxley took up and built on Teilhard de Chardin's ideas, particularly within the context of framing them scientifically rather than religiously. The history and evolution of transhumanism is important in order to understand how the movement came to be as well as how it has continued to shift since its formalization in the 1990s.

As I have described and will continue to analyze throughout the following chapters, transhumanism has a broad definition and therefore a multiplicity of meanings, visions and goals. The purpose of exploring the etymology as well as religious influences on transhumanism is to highlight the way in which these particular future visions are informed, as well as the impact on

[2] In the notes in Vita-More's *Aesthetics* (2013), she draws this comparison. 'Peking Man,' a subspecies of homo erectus of which Teilhard de Chardin took part in the discovery ("Pierre Teilhard de Chardin," 2024). "Huxley stated 'human species will be on the threshold of a new kind of existence, as different from ours as ours if from that of Peking man' (1957: 13-17)" (Vita-More, 2013, p. 25)

the multiplicity of social movements and pursuits of these visions today, namely the secular underpinnings of transhumanism.

4.2.3 Contemporary Relationship Between Transhumanism and Religion

In moving towards discussing the more modern influences on transhumanism as well as the contemporary relationship between religion and transhumanist values, this section examines how these religious influences come to inform modern transhumanism.

It is important to consider the multiple perspectives and co-existence of the religious as well as science fiction, technological and scientific influences on contemporary transhumanism. Michael (2000) argues that influences on future expectations are connected and conjured from "disjointed perspective[s]… [including] the circulation of multifarious, heterogeneous entities: humans, knowledges, languages, objects, and processes." (p. 34). Furthermore, Michael (2000) argues:

> Importantly, such connections entail contact and communication between disparate entities. For example, how is it possible that the same motifs appear in science and myth? How are these connected? As Latour (1987) and Harari and Bell (1982) notes, Serres' approach to this 'parallelism' does not entail a dominance of one text or tradition over another – there is no critique or commentary or metalanguage exercised by one over the other (say, science over myth). Rather, there is seen to be what Latour calls a cross-over, wherein the insights to be derived from myths or fables are no less valuable than those that flow from physics. One is not anachronistic, the other modern. They co-exist; they are co-present. (pp. 34–35)

Multiple perspectives, influences and understandings, Michael (2000) argues, co-exist, that is, one is not more or less valuable than the other, all of these aspects play an important part in what comes to inform both what transhumanism means as well as how and what the future visions value and conjure.

More (2013a) considers modern transhumanism as a life philosophy because of its roots in in Enlightenment humanism, from where its emphasis on technological progress and secularism is

derived. It is through humanist values that More (2013a) describes transhuman values as explicitly secular: "…taking personal charge of creating better futures rather than hoping or praying for them to be brought about by supernatural forces, on reason, technology, scientific method, and human creativity rather than faith." (p. 4). More (2013a) further argues that transhumanism could be referred by the term "eupraxsophy," coined by secular humanist Paul Kurtz (1988), "as a type of nonreligious philosophy of life that rejects faith, worship, and the supernatural, instead emphasizing a meaningful and ethical approach to living informed by reason, science, progress, and the value of existence in our current life." (More, 2013a, p. 4). More (2013a) offers the dominant secularist view of transhumanism.

Brooks (2020) explains Kant's thoughts on the Enlightenment, which I understand to be the epitome of how More (2013a) conceptualizes transhumanism.

> The basic argument that underwrote the thought of the Enlightenment is that reason is universal and inherent to humans, and that if society could strip away the pernicious patterns of tradition, superstition, and ignorance, humankind would arrive naturally at a harmonious society…While Kant's essay probably overstated the Utopian qualities of the thought of his era, he was right that it did correspond to a major shift in how educated Europeans thought about the world and the human place in it. (Brooks, 2020, pp. 351–352)

More (2013a) pointedly stresses the importance of the secular point of view of transhumanism along with its salvatory qualities, which in and of itself provides a tension in the pursuit of transcendence. For example, Wood (2021) argues that similarly to the religious concepts of rebirth or salvation and analogous to sinfulness, transhumanism looks to overcome the limitations of our current human biological and evolutionary conditions and constraints. Wood (2021) also argues that transhumanism can be seen as similar to religion through the concept of omnipotence or immortality. Wood (2021) argues that "superintelligence won't deliver a full omniscience, but it will provide more information and more insight than ever before. Super-

longevity isn't the same as immortality, but it will result in lives spent in a youthful state for an indefinite period of time. There's a sense, therefore, that transhumanism envisions the conquest of death." (p. 439).

Alternatively, Interviewee #3, an anti-religious transhumanist, described the visions of conquering death to be the ultimate act of defeating religious worldviews in favor of scientific experimentation and discovery.

> So many people are afraid of the normal unknown things … this is normal … For example, death. We have always died, until today. No human has survived death until now. Therefore, we tried to explain why it is good to die. Religions explain why it is good to die, because it is sad to explain why it is bad. So, we tried to say that it is good, it is a higher level, it is loyalty to species, any of these bullshit concepts. But death is not good, even when people are dying you can see they would like to live a bit longer … And that was okay, because there was no alternative until now. Now, we know we have an alternative. (Interviewee #3)

Interviewee #3 is overzealous in stating that there are definitive alternatives to death, they along with Wood and More, illustrate a multiplicity of the contemporary viewpoints between transhumanism and religion.

While many others would agree with More's secular views, my understanding of this worldview is that it has an interesting and complicated past with religion. As discussed by Wood (2021) and many interviewees, transhumanism can also be seen as deeply informed by religion. Interviewee #9 described, "…it should be obvious, that it is evident that religion has deeply informed the origins of transhumanism. Deeply!"

Counter to the dominant narrative of transhumanism as being secular, there are many religious transhumanists and organized religious transhumanist groups, such as the Mormon Transhumanist Association and the Christian Transhumanist Association. My sample of interviewees included transhumanists who were definitively secular, those who were spiritual,

others who were outright anti-religious, and those who integrate transhumanism alongside their faith.

As an illustration of the wide use and meaning of transhumanism, and a counterexample to the common secular definition, three separate interviewees discussed that discovering transhumanism helped them to resolve personal crises of faith by adding a different perspective to their religious worldviews. For example, Interviewee #9, a transhumanist social movement leader, described transhumanism helping them solve a crisis of faith. They begin by describing that while some in their religious community do not get excited by transhumanism and its visions, others do.

> [Transhumanism] helped situate many theological ideas that I liked and cared about but could no longer believe it on an intellectual level. It helped me resituate those and assert them in a more living way, a way that I could embrace, without losing my strong attachment to science and to technology. In fact, that strong attachment to science and technology actually helped rebuild my faith with the help of transhumanism. (Interviewee #9)

Interviewee #9 describes how transhumanism has aided in resolving a crisis of faith alongside embracing the scientific and technological ideals and logic of transhumanism. They illustrate both the importance of religious transhumanism alongside an issue that I examine in the following chapters, that argues that transhumanism has too broad a meaning and lacks a value judgement, therefore transhumanist ideals become taken up by different social groups in way that are not easily reconciled with one another.

Because transhumanism has a broad meaning and can support different worldviews, the history and historical influences of transhumanism are important to unpack and understand. Wood (2021) provides an alternative view to More (2013a), arguing that transhumanism has been influenced by religion as well as a variety of other views. According to Wood (2021), "[Transhumanism is] a movement that can be seen as the culmination of many previous historical forces, including both religion and humanism." (p. 357). While Wood (2021) argues that

transhumanism is often critiqued as 'religion in disguise,' he also argues that: "I accept that transhumanism has key similarities with religions. It provides a comprehensive view of life, history, possible futures, and the role of humanity. It highlights the possibility of modes of existence that far exceed those of current everyday living. It suggests that profound human fulfillment lies beyond what we can already see." (Wood, 2021, p. 438). However, Wood (2021) also emphasizes that there are key differences separating transhumanism from religion, arguing that there are no scriptures, rituals or prophets in transhumanism. Additionally, Wood (2021) argues that transhumanists place emphasis on human action and agency, whereas religions place human destiny "in the hands of powers beyond our control." (p. 439). Wood (2021) offers a non-dominant take, countering the strictly secular view of transhumanism. Wood's argument is illustrative of the multiplicity of uses of the term transhumanism and indicative of the multiple worldviews that transhumanism can support. Further, Wood (2021) provides complexity in different understandings of transhumanism's roots.

While there are many that seek to critique transhumanism as a religion gone wrong, or a bastardized version of religious sentiments (Damour, 2017; Evans, 2022; O'Gieblyn, 2017; Smith, 2018), I want to make clear that I am not judging or prescribing transhumanism as a religion, but stating that is has roots in religious ideals and some key similarities or entanglements with religion.

4.2.4 Conclusion

This section has discussed the co-existence of secular and religious underpinnings using empirical and secondary sources of analysis on transhumanist values and discourses. These values are personal and political in nature. I view the influences of both religion and science as co-existing within transhumanist narratives. According to Michael (2000), one is not modern while the other

is anachronistic. Therefore, this section has discussed both the historical and contemporary relationship between transhumanism, secularism and religion.

4.3 The Formalization of Transhumanism

4.3.1 Introduction

This section will continue exploring more contemporary self-histories of transhumanism, focusing on the term and its usage throughout the mid to late 20th century through to the formalization and institutionalization of modern transhumanism. Below I highlight events that transhumanist actor interviewees expressed as important and have organized them into a chronological timeline. In this section I focus attention mainly between popular transhumanist documents and on the narrative histories that interviewees described.

4.3.2 Towards a Formalization of Transhumanism

As a precursor to transhumanism, in the mid 20th century, scientists began exploring what were once deeply science fiction ideas. Specifically between the 1920s and the 1950s, Dvorksy (2022) argues that scientists such as British biologist J.B.S. Haldane, Irish scientists J.D. Bernal, and British biologist Julian Huxley "were openly advocating for such things as artificial wombs, human clones, cybernetic implants, biological implants, and space exploration." (para. 10). As discussed above, Huxley coined 'transhumanism' in 1951, wherein he associated it with the possibility of the human species transcending itself.

Bernal, a scientist and historian, who is considered an early STS scholar, wrote the monumental four volume *Science in History* (1954). Republished by MIT Press in 1971, and still in print, *Science in History* was "the first full scale attempt to analyze the relationship between science and society throughout history… This remarkable study illustrates the impetus given to

and the limitations placed upon discovery and invention… and conversely the ways in which science has altered economic, social, and political beliefs and practices." (*mitpress.mit.edu*, n.d.). Bernal (1954) made an impact on early STS in being the first to write a historical account considering the relationship between science, technology and society.

Bernal's work was influential to early transhumanists through future thinking in science, society and beyond. Jasanoff (2015) argue of the profound influence that science fiction has had on scientific and technological visions as well as some of their material configurations. For example, "one hundred fifty years passed between the youthful Mary Shelley's fantastic story of a vengeful creature brought to life by Dr. Frankenstein and the production of new life forms in twentieth-century biological laboratories (Shelley 2008 [1818]). (p.1)." With his influential book, *The World, The Flesh & The Devil: An Inquiry Into the Future of the Three Enemies of the Rational Soul* (1929), Bernal proposed the Bernal sphere, which was envisioned to be a type of space settlement intended to be a long-term home for permanent residence. Futurist Arthur C. Clarke described *The World, The Flesh & The Devil* (1929), as "the most brilliant attempt at scientific predictions ever made" (Clarke, 2000 as cited in Brown, 2005, p. 70). Scholar Robert Scholes (1977) argued that this is a "book of breathtaking scientific speculation" that "is probably the single most influential source of science fiction ideas." (p. 240).

Bernal's (1929) work is indicative of the science fiction of its time, as Ball (2019) argues, early days in the field of biology and biochemistry made today's future visions look conservative. According to Ball (2019), Bernal's visions included cyborg type existences, that would get rid of "the useless parts of the body" and be replaced with mechanical devices, such as artificial limbs and sensory devices. Bernal (1929) describes a vision analogous to a "brain in a vat," scenario, where machines support life, in lieu of a body.

> Instead of the present body structure we should have the whole framework of some very rigid material, probably not metal but one of the new fibrous substances. In shape it will be rather a short cylinder. Inside the cylinder, and supported very carefully to prevent shock, is the brain with its nerve connections, immersed in a liquid of the nature of cerebro-spinal fluid, kept circulating over it at uniform temperature. The brain and nerve cells are kept supplied with fresh oxygenated blood through the arteries and veins which connect outside the cylinder to the artificial heart-lung digestive system—an elaborate, automatic contrivance. (Bernal, 1929, p. 17 as cited in Ball 2019, p. 291)

Ball (2019) argues that Bernal's work, along with Julian Huxley, and other biologists and biochemists of this era, S. Haldane, Joseph Needham, and Conrad Hal Waddington, "laid the foundation of both development and molecular biology while at the same time weaving those advances into a committed vision of the social roles of science." (p. 290-291). Bernal illustrates an example of profound future thinking that came to influence many scientific endeavours, as well as the importance of considering the social implications of these types of grand technological innovations.

The next author to take up 'transhumanism' was FM Esfandiary (1972) (also known as FM.2030), according to Doat & Dorthe (2023). FM.2030 and first used the term 'transhuman' to refer to a transition beyond human in the final chapter of *Women the Year 2000* (Esfandiary, 1972). 'Transhumanism' also appears in FM.2030's essays *UpWingers: A Futurist Manifest* (1973) and *Are You a Transhuman? Monitoring and Stimulating Your Personal Rate of Growth in a Rapidly Changing World* (1989). FM.2030 used the term in the context of a 'transitional human,' in which the transition refers to the transition towards post-humanity, or "early manifestations of new evolutionary beings" (Doat & Dorthe, 2023; Esfandiary, 1989, p. 42; MacFarlane, 2020). MacFarlane (2020), describes the context in which FM.2030 (Estandiary) uses the term: "Esfandiary's description here deliberately evoked a strong sense of teleological-rational progress, as he maintained the technological transhuman would imminently surpass the organic human, and, inevitably, the transhuman will itself, in turn, be superseded by the posthuman." (MacFarlane,

2020, p. 28). In *Are You A Transhuman?* (1989), FM.2030 defines transhuman as "a new kind of being crystallizing from the monumental breakthroughs of the late twentieth century. ... They are the earliest manifestations of new *evolutionary* beings." (FM.2030, 1989, pp. 204–205 as cited in Bohan, 2018, p. 344). Therefore, as Bohan (2018) argues, "although the etymology of the term "transhuman" goes back further, FM.2030 is notable for using it in something approaching, though not fully resembling, a modern transhumanist worldview." (p.344).

As discussed in chapter 2, while transhuman and posthuman are broadly used synonymously, there are important nuances between the two. MacFarlane (2020) argues that within FM-2030's framework, transhumanism represents engaging in measures to overcome human biological limitations, whereas the posthuman represents the emergent possibility of shedding the constraints of human frailties, such as sickness, ageing or death. More (2013a) explains that becoming posthuman entails "exceeding the limitations that define the less desirable aspects of the 'human condition'… (but they are likely to face other challenges)" (p. 4). Post-humans are thought to have greater physical capabilities, which is referred to as "morphological freedom" (More, 2013a, p. 4), while also experiencing greater cognitive capabilities as well as more refined emotions, meaning more happiness and joy and less anger and depression. While, transhumanism, as More (2013a) describes, "typically looks to expand the range of possible future environments for post-human life, including space-colonization and the creation of rich virtual worlds." (p. 4). Transhumanism, then, relies primarily and heavily on technology to enact these changes to the human condition (More, 2013a).

Doat and Dorthe (2023) argue that in addition to FM.2030, other activists helped to shape transhumanism in the 1970s. "A small group of authors and activists shape transhumanist ideas in the countercultural context of the 1970s California, such as Robert Ettinger for cryonics, Timothy

Leary with psychology and experiments with psychedelics, Eric Drexler on nanotechnology, or the designer Natasha-Vita More." (p. 696). European academic researcher, transhumanist and futurist, Interviewee #5, spoke in great detail about the major events that led to the formalization of transhumanism as well as the political landscape of the movement along the way. Interviewee #5 spoke of the influence of the California ideology that emerged in the mid 1990's. They described many different futurist groups emerging and merging through the facilitation of the early internet and being able to come together and think optimistically about technological future visions through the Extropian movement, which was the first explicit transhumanist organization. Interviewee #5 explained the influence of formalizing the extropian movement and its influence on the California ideology.

> So, the transhumanism movement as we know it today, started forming in the 1980's. You can, of course, trace it much further back. And [Ed] Regis [(1990)] book, *The Great Mambo Chicken and the Transhuman Condition* is actually a pretty good description of the state in the late 1980s, showing that you have the cryonics people, you have the life extension people, you have people interested in mega scale engineering and space settlement. All these future groups were kind of starting to come together and then the Extropian Institute showed up, which was kind of the first modern organization that had an explicit transhuman agenda, was explicitly calling itself transhumanist, trying to formulate that transhumanist philosophy. Max More, I think, did a wonderful job of trying to formulate some of these ideas, and then many people were quite interested, and we are talking kind of optimistic California here, so you got what some people call the California ideology.[3] (Interviewee #5)

Interviewee #5 illustrated the influence of a variety of social groups interested in the pursuit of what becomes known as 'transhumanist' visions. In the following chapters, I examine the multiplicity of meanings and values throughout transhumanist social groups. I argue that the term transhumanism is broadly used and therefore the meaning of the term has diminished over time. Other altruistic and techno-solutionist movements have emerged in its place, as many

[3] California Ideology: see (Barbrook & Cameron, 1996; Turner, 2006)

interviewee's described, such as effective altruism. What is important here, is that Interviewee #5 described that even prior to its formalization, the philosophies surrounding the values of early transhumanism, aka, extropianism, were multiple and consisted of a variety of goals and values.

For example, Doat and Dorthe (2023) argue explicitly that the transhumanist movement was built on the foundation of three different groups of actors.

> The sociology of the transhumanist movement was already structured into three groups of actors, that would help developing it up to today: (1) industrialists and entrepreneurs of neoliberal or even libertarian obedience; (2) activists who gather in associations in a dozen countries, more and more leaning towards the technoprogressist branch of the movement (especially in Europe) that advocates for an equal access to technology and public funding for research on healthy longevity; and (3) academics working in bioethics or sociology at Oxford University (UK) and in some US universities who tend to distance themselves from More's extropianism, root transhumanism into the utilitarian tradition, and moderate its technosolutionist optimism by an exploration of existential risks. (Doat and Dorthe, 2023, p. 696)

As Doat and Dorthe (2023) describe, entrepreneurs, activists and academics shape transhumanism into the modern formalized movement with three pillars of focus, super-intelligence, super-longevity, and super-happiness. Different political leanings inform different goals and social agendas. Examples of what Doat and Dorthe (2023) describe includes Silicon Valley or Bay Area libertarianism, such as Ray Kurzweil and the Singularity, technoprogressivists, which include James Hughes and the IEET, and the existential risk academics, such as FHI and Nick Bostrom. However, eventually politically motivated differences arise which I will be exploring throughout the following chapters.

Moving towards the formalization of modern transhumanism, the principles of extropy were written in the late 1980s by Max More, a British philosopher. The principles of extropy were the first iteration of an explicitly transhumanist agenda. The philosophy or extropy, or extropianism is outlined under the Principles of Extropy (More, 2013a). Extropianism is "a philosophy of the

future to proactively advance the human condition using strategic applications of science and technology." (MacFarlane, 2020, p. 28). It was in the 1990's that the term was first used to deliberately label transhumanist philosophy in *Transhumanism: Towards a Futurist Philosophy* (More, 1990). "Extropy" was a concept used not as a technical term opposed to entropy, but as a metaphor under which to define and formulate the goals of transhumanism (ibid).

> The Principles [of Extropy] were formulated to 'use current scientific understanding along with critical and creative thinking to define a small set of principles or values that could help make sense of the confusing but potentially liberating and existentially enriching capabilities opening up to humanity' (More 2003). The goal was not to specify particular beliefs, technologies, or policies. The Principles of Extropy consist of a handful of principles (or values or perspectives) that codify proactive, life-affirming, and life-promoting ideals supportive of transhumanism. (More, 2013a, p. 5)

Defining the core principles of extropy became the first explicit and comprehensive document embodying the core elements of transhumanism, including "perpetual progress, self-transformation, practical optimism, intelligent technology, open society, and rational thinking." (More, 2013a, p. 5).

The Extropy Institute, founded in 1991 by Max More and Tom Bell (known as T.O. Morrow), operated as a not-for-profit educational organization. The goals for the institute were to "(1) develop an elegant, focused philosophy for transhumanism—the philosophy of "Extropy"; (2) encourage discussions and debates on improving the human condition; and (3) develop a culture for activists, energized and devoted to bringing these ideas to the public." (*Extropy Institute: Next Steps*, n.d.). The board of directors felt they had met these goal through their journal, *Extropy: The Journal of Transhumanist Thought*, 5 Principles of Extropy Conferences, public forums such as email lists, and public presentations such as news, radio and tv presentations (*Extropy Institute: Next Steps*, n.d.). The Extropy Institute therefore closed its doors in 2006, stating that "ExI deems its mission as essentially completed." (*Extropy Institute: Next Steps*, n.d.).

Although there are multiple and contested versions of transhumanism, all versions share some grounding with the Principles of Extropy. However, differences in political views become a major dividing point between different transhumanist social groups. Extropian views were libertarian leaning, a political view that some transhumanists found themselves opposing (Interviewee #4, Interviewee #8).

> I associated transhumanism with the extropian movement associated with Max and Natasha [Vita-]More. And this is a bit simplistic, but Extropianism was associated with free market fundamentalism, libertarianism, and my background certainly has been left liberal, more kind of welfare statist, though, ideally transhumanism seeks to transcend labels of left and right, you could say in some ways that my conception of transhumanism is more paternalist, indeed, you know, the very idea of compassionate stewardship of the biosphere. (Interviewee #4)

Interviewee #4, a European transhumanist philosopher, specializing in ethics, demonstrated some of the political undertones and views of Extropianism which is also illustrative of a larger political tensions and division within transhumanist groups, further explored in chapter 5. Furthermore, Interviewee #5 described how the political views eventually divided and therefore broadened the movement, leading to different understandings, outlooks, and social movements, which I examine as fragmentation in chapter 7. Interviewee #5 explained: "The Extropian community, that was a fairly libertarian Californian discussion, but as it got wider, of course, you got the European Social Democrats and the people with different political views and life outlooks, so it became broader and there was a lot more debates and different interpretations."

The internet in the early 1990's helped bring about the formalization of the transhumanist movement. Many transhumanists, being tech enthusiasts, ended up on early transhumanist mailing lists or message boards, a development that helped them meet other like-minded future thinkers and technological enthusiasts. Doat and Dorthe (2023) argue, "investing [in] the new means of communication provided by the emerging Internet, many entrepreneurs and future figures of the

Silicon Valley, academics such as David Pearce, Anders Sandberg, and Nick Bostrom, as well as various supporters, enthusiastically joined this nascent movement." (p. 696).

In the late 1980s and early 1990s computing technology was becoming more powerful, sparking transhumanists like David Wood (2021), a pioneer of the smartphone industry and Chair of London Futurists, to ask themselves how to steer these new technological capabilities in a positive direction.

> Back in the late 1980s and early 1990s, my work colleagues and I could see that computing technology was becoming ever more powerful. We debated long and hard, revisiting the same questions many times as forthcoming new hardware and software capabilities came to our attention. What kinds of devices should we design, to take advantage of these new capabilities? Which applications would users of these devices find most valuable? How might people feel as they interacted with different devices with small screens and compact keypads? Would the Internet ever become useful for "ordinary people"? Would our industry be dominated by powerful, self-interested corporations with monolithic visions, or would multiple streams of innovation flourish? My initial involvement with these discussions was informal… But I enjoyed animated the lunchtime discussions… where technical arguments about, for example, optimising robust access to data structures, were intermingled with broader brainstorms about how we could collectively steer the future in a positive direction. (Wood, 2021, p. 2)

Vita-More (2019) credits the internet for turning the philosophical views of transhumanists into an emergent cultural movement. Extropians and transhumanists used the internet for newsletters and message boards, quickly realizing that there were others who shared their futurist views. However, Vita-More (2019) is explicit in that the internet was a meeting place for these groups, arguing that the enthusiasm for transhumanist type visions pre-date the internet: "However, *before* the Internet, transhumanism was seeded by people who were curious about new technology and how AI and nanotechnology can change the world. This curiosity was the intellectual fuel accelerated alongside the tech industry. We simply wanted to think about and talk about where technology was heading." (Vita-More, 2019, p. 51).

Interviewee #10, a transhumanist actor who focuses on longevity, describes the Extropy magazine, which contained explicitly transhumanist ideas, as an eye-opening experience for many, explaining that the circulation of the magazine made people realize there was a community of people who thought like them, who had never encountered one another before, suddenly realizing they were not alone. Interviewee #5 describes being able to access the internet as an undergraduate student. They describe the enthusiasm of joining transhuman mailing lists, further, stating the joy of reading posts from people they had been reading about engaging on these lists.

4.3.3 Institutionalizing Transhumanism

Interviewee #5, who has been an active transhumanist since the early days of the internet, described the progression and cohesion of transhumanism in the 1990's, which led to its formalization, through the aid of the internet, as an international social and philosophical movement with the establishment of the World Transhumanist Association.

> But what happened in the 90's was a lot of talking ideas, some people had more practical projects like the cryonics organization [they] always had to have some liquid nitrogen and treating patients they always had to deal with the actual real world, and many people had software businesses and other things, but it was a lot of talk. And I think what happened then in the 90s was a big cohesion building exercise as the web emerged, especially my website was very much a bit of a lightning rod in helping people [discover] like, 'oh there's something called transhumanism and I'm actually in it.' So that helped them link people to organizations, we started more organizations… and then we created the World Transhumanist Association, which later became Humanity+. And that also led to a widening of the movement. (Interviewee #5)

Interviewee #5 described the way in which transhumanism became formalized, which was facilitated with the information and communication technology of the internet.

Bohan (2018) argues that while extropianism has its largest member base in the US, with roots in California, the World Transhumanist Association (WTA) was founded in the UK in 1998 by David Pearce and Nick Bostrom and was legally incorporated in 2002 with the help of James

Hughes who served at the first executive director. Bohan (2018) argues that while the WTA was democratically oriented, the online extropian culture inspired the WTA leaders. While remaining on good terms with extropians like Max More and Natasha Vita-More, who are transhumanist thought leaders during this time, Bohan (2018) argues that "with new blood, and new transhumanist collaborations afoot, the collective philosophy of transhumanism became more nuanced, politically savvy, and influential." (p. 209).

The WTA was established to advocate for the ethical use of technology to improve the human condition as well as to promote transhumanism as a legitimate area of scientific research and public policy. Bohan (2018) cites Bostrom (2005) to explain the purpose of the WTA. "As Bostrom relays, the WTA was created "to provide a general organizational basis for all transhumanist groups and interests, across the political spectrum."[(Bostrom, 2005, p. 12)]… The WTA slowly picked up where extropianism tapered off, becoming the most prominent transhumanist brand and institution of the 2000s." (Bohan, 2018, p. 209). Importantly, the first Transhumanist Declaration, which provides the movement with a structured set of core values, was written in 1998, facilitated by the founders of the WTA, Nick Bostrom and David Pearce, argues Doat and Dorthe (2023). According to Bohan (2018), by the mid 2000's the WTA had more than 3,000 members with chapters holding regular meetings all over the world.

4.3.4 'T' is for Toxic

Within its first decade the WTA had succeeded in becoming more credible than the extropian movement has, according to Bohan (2018). Despite this success, in 2008 the WTA changed its name to Humanity+ in a rebranding effort to become more mainstream. Bohan (2018) argues that transhumanists such as Russel Blackford were highly aware of the 'nerdy,' marginal, white male dominated space the WTA occupied. With 89% of WTA membership being male, at

that time, the WTA was looking for a meaningful voice in social issues and distance themselves from genetic engineering associations like eugenics, according to Bohan (2018).

Humanity+ still operates today under leadership of Natasha Vita-More as Executive Director, and Ben Goertzel, Jose Cordiero on the board of directors, with Max More, Martine Rothblatt, David Wood and Anders Sandberg as featured advisors. According to Humanityplus.org, "Humanity+ advocates for the ethical use of technology and evidence-based science to expand human capabilities." (*Humanityplus.Org*, n.d.). Interestingly, Humanity+ sets its current goal as to "reclaim the true meaning of transhumanism" (*Humanityplus.Org*, n.d.), as well as to clear up misconceptions, stating:

> What has been missing from the transhumanist scope of the past decade is a necessary attention to the misconceptions of transhumanism. Often opinions are made that are based on errors in both academic works and mainstream articles that skim off the top of faulty information without checking for accuracy. Humanity+ has made it an important part of our organization to do our best to correct misconceptions and misrepresentations of the philosophy and worldview. (*Humanityplus.Org*, n.d.)

As described earlier, the goal of clearing misconceptions and promoting the 'true meaning' of transhumanism has been a long-time interest of Vita-More's. I find this contemporary mandate of Humanity+ interesting because it is indicative of my findings for this project, that the boundaries and meaning of transhumanism have become fuzzy and broad. I argue that because of the broad use and multiple meanings of the term, as well as other social movements filling these techno-solutionist future visions, 'transhumanism' has diminished in its value. Many transhumanist interviewees for this project were highly aware of the stigma attached to 'transhumanist.'

Wood (2021) describes that when writing *Vital Foresight: The Case For Active Transhumanism,* he was actively encouraged not to use the word 'transhumanism.' "[The] advice I received from a number of friends when they heard what I was writing about… 'Don't put that

word on the cover of your book!'… They urged me to avoid "the T word" – "transhumanism". That word has bad vibes, they said. It's toxic." (p. 1).

However, American scholar and transhumanist, Interviewee #8, gave an intimate insider's perspective on the political issues that arose within the WTA. Interviewee #8 described that there was tension and greatly different codes of ethics between actors with libertarian political views and actors with 'left-winger' politics. Interviewee #8 described that it was political tension that drove actors away from Humanity+ to start other organizations, such as the founding of IEET, describing Humanity+ as not representing the global goals it set out to represent. "Between [many] leaving and the determined efforts of the Silicon Valley billionaires the Humanity+ more or less reverted to their control and they were not interested in a global organization that represented Nigerian transhumanism as equally as Silicon Valley transhumanism. So, it became a very different beast." (Interviewee #8).

Following political differences, the Institute for Ethics and Emerging Technologies (IEET) was set up as a think tank founded by James Hughes and Nick Bostrom in 2004. Giving itself a 'techno-progressive orientation, the IEET "is a nonprofit think tank which promotes ideas about how technological progress can increase freedom, happiness, and human flourishing in democratic societies. We believe that technological progress can be a catalyst for positive human development so long as we ensure that technologies are safe and equitably distributed." (*Ieet.org*, n.d.). The IEET publishes articles in the Journal of Ethics and Emerging Technologies and has over 9000 articles published on their website. The IEET is still in operation today, and importantly offers a democratic view to future socio-technical visions.

4.3.5 Public Critique

Following the formalization of the WTA/Humanity+ and research institutes, such as the IEET, Interviewee #5 described the need for a cohesion of transhumanism through professionalization and creating allies when transhumanism met public and intellectual critique spearheaded by Fukuyama's (2002) critique of transhumanist projects, specifical surrounding biotechnologies.

> I think what happened somewhere around the turn of the millennium, was partially Francis Fukuyama's [(2002)] *Our Posthuman Future* that suddenly meant that here is somebody who's a renowned public intellectual critiquing the movement, with a lot of crappy arguments, we felt, … So suddenly we got a lot of natural allies, everybody who didn't like George W Bush's take on bioethics was suddenly [waving] on the transhumanists side. And many of us felt like we needed to step up here as public intellectuals and argue our case. So, there was a professionalization happening. And then of course you also got many people starting organizations. It's easy to be on a mailing list and spend a lot of time debating when you're a student. Eventually you need to work on your PhD, and you dropped out of mailing lists. After that, you might start your company, or you might go into the academic area. So, what has happened is, of course, that cohort is now we're starting to be professors or running companies or having organizations. So, we are all out in the real world, which means that we're quite often not debating. It's very sad to go back to the Extropian mailing list these days… (Interviewee #5)

Interviewee #5 captured the need for transhumanists social groups to unite against a public intellectual critique, as well as the movement moving towards professionalization. During our interview, Interviewee #5 reiterated many times that much of what was happening prior to this moment in time throughout social movements within transhumanism was 'a lot of talk.' As Interviewee #5 described, a public critique came from Fukuyama (2002), who's primary concern was the implications of biomedical advances, arguing that we face the possibility of a future in which our humanity itself will be altered beyond recognition.

Fukuyama's (2002) critiques sparked fear and anxiety about what emerging technologies would be capable of, which created a situation in which transhumanists needed to stand together

as a community to defend their visions, particularly around biotechnologies, which have an association with eugenics. With transhumanist visions becoming more broadly recognized outside of the movements themselves, an idea I address in the following chapters, comes a growing recognition that the technologies within these visions are powerful and can have serious social, ethical, and financial implications. This creates backlash in which transhumanists had to work together to counter.

Fukuyama's (2002) critique as well as Interviewee #5 described a point of institutionalization, wherein transhumanism has become enough of a norm that critiques can be rendered against it. This phase can only be present with a particular level of integration and normalization within society.

4.3.6 Professionalization

The institutionalization of transhumanism is apparent in the establishment of The Future of Humanity Institute (FHI), headed by Nick Bostrom at Oxford University in 2005. FHI, as discussed in the introduction was a multidisciplinary research group contributing to research in areas of big picture questions surrounding the future of humanity and technology, including: "existential risk, effective altruism, long-termism, AI alignment, AI governance, global catastrophic risk, grand futures, information hazards, the unilateralist's curse, and moral uncertainty." (Sandberg, 2024, para. 2).

Both transhumanism, through FHI, as well as the effective altruism movement have strong roots at Oxford, argues Bohan (2018). "The convergence of these small, but increasingly influential intellectual cultures, [transhumanism and effective altruism] is notable as a further sign that transhumanism is garnering increasing academic and cultural credibility." (Bohan, 2018, p. 248). Despite its closure, the 20 years of operation of FHI within Oxford University not only

increases credibility for transhumanist visions, but these visions also shape and become shaped by an academic research agenda.

A polarizing development in the transhumanist social movement took place in the United States in 2014, when Zoltan Istvan ran for the US presidency. In October 2014, Zoltan Istvan ran for Presidency of the United States on a Transhumanist platform for the 2016 election. To raise awareness for his campaign and transhumanist political issues, Istvan, a libertarian transhumanist, created the Immortality Bus campaign, in which he drove a coffin shaped bus around the United States, "to spread the news that 21st Century technology can conquer biological death within the next 25 years- if only citizens and the government will support it." (*Zoltanistvan.com/Immortalitybus.html*, n.d.) Istvan also delivered the Transhumanist Bill of Rights to the US Congress in Washington DC. The US Transhumanist Party, a United States transhumanist political party, was founded on Zoltan's political campaign and is active today. Currently, the US Transhumanist Party is chaired by Gennady Stolyarov II, who took over as chairman in November 2016. The party most recently endorsed Tom Ross for the 2024 US Presidential election under the platform of 'defragment America' and risks of existential threat (*Transhumanist-Party.Org*, n.d.).

The US Transhumanist Party was polarizing amongst transhumanist actor interviewees, many claiming that transhumanism is not a political movement, and that the Immortality Campaign was embarrassing. Interviewee #8 described the US Transhumanist Party as libertarian, however, adamantly distinguished that transhumanism is not a political project.

> *Transhumanism is not a political program* [emphasis added]. We have to define a political program and to define a political program you have to have a politics … the British transhumanists attempted to organize a political party and didn't go anywhere because it turned out they didn't agree about anything. The US Transhumanist Party was pretty much the brainchild of Zoltan Istvan, it was his performance art project, basically [but] he wasn't interested in actually running a

> political party. So, Gennady Stolyarov took it over and Gennady is a libertarian… and the US Transhumanism Party is more or less libertarian. So, that works. I wish they would call it the libertarian party or something like that. I don't know of any other really serious ongoing transhumanist political project, other than what Gennady is trying to do. (Interviewee #8)

Interviewee #8 described the political leanings of the US Transhumanist Party, while also describing confusion over the motivation and need for it. They emphasize transhumanism as not being a political project, and the unsuccess at past projects that have attempts to organize this way. Longevity expert, Interviewee #10 expressed similar sentiments, having expressed confusion and contempt at the mission and need for a transhumanist political party.

> Not a big fan! I like Zoltan, but you know, I cringe at some of the stuff he would say, he's very good at pushing people's buttons and kind of writing the most extreme stuff. His death bus I thought was kind of embarrassing but the transhumanist party, I don't really like what they're doing, I don't really think it should be a party, because at this point it's obviously not going to win anything. I don't know why you want a party. I guess it's a way of trying to get more publicity, but I would rather have policy Institute's that work on policies that maybe get the actual parties who are in power to adopt some of them. And that's the way you know the way a lot of changes have happened. (Interviewee #10)

Other interviewee's (#6, #7, and #9) described Istvan and the campaign to be antagonistically anti-religious. Interviewee #9 claiming that Istvan's anti-religiosity was a ploy to get attention for his political campaign. A transhumanist community thought leader, Interviewee #9 described that the social movement that they are a leader in initiated a petition to disavow Istvan as a transhumanist representative, because his views are not representative of transhumanism. Interviewee #9 described: "transhumanism is more diverse than what Zoltan Istvan was representing." Furthermore, Interviewee #20, an academic researcher whose work focuses on the ethical, social and legal implications of emerging technologies, described Istvan's lack of self-awareness and criticality, "I would say he is somebody who is not very self-critical, and the articles that he writes do not show a sort of critical, reflective mindset."

The example of polarizing opinions of Istvan and the US Transhumanist Party serves to illustrate some of the political and personal tensions between transhumanists and transhumanist groups. In the following chapters I argue that these tensions, in part, have caused epistemic fragmentation between transhumanist groups which has therefore had an impact on the public reception of transhumanist visions.

Finally, but not exhaustively, the Machine Intelligence Research Institute (MIRI), founded by Eliezer Yudkowsky, works towards transhumanist visions, such as AI alignment. MIRI is a private non-profit research institute largely focused on researching AI risks and how to mitigate them, or in other words, research on friendly AI design and AI control problems. MIRI was discussed by many interviewees, especially within the capacity of the association and name change of Singularity Summit. When I described to interviewees that I had performed field work for my master's degree at the 2017 Global Singularity University Summit, many brought up the history and wanted clarity on which 'summit' I really meant.

Author, researcher and transhumanist actor, Interviewee #13 and I discussed the changes between the Singularity Institute and the Singularity University Summit, when I mentioned that I had attended the Global Singularity Summit in 2017. I attended the summit based on the article *Re-Enchantment Cosmologies: Mastery and Obsolescence in an Intelligent Universe* by Abou Farman (2012). Farman's article focused on his anthropological research in attending one of the Singularity Summits (pre-Singularity University acquisition). Farman's (2012) article had a tremendous impact in introducing me to many of the ideas and research questions I still pursue today. Therefore, at the first chance to engage in original research, I headed to San Francisco to attend the 2017 Global Singularity University Summit. This experience informed my master's

thesis. It is only after speaking with Interviewee's for this project that I understood the transaction and Singularity University acquisition of these Summits.

Interviewee #13 and I discussed these changes:

Interviewee #13
What year did you go?

Dayna
I went in 2017.

Interviewee #13
Because the singularity summits have changed quite a lot. Singularity University events have changed quite a lot. I went in about 2014 to an event in Amsterdam which I thought was really world class.

Dayna
Oh cool. It's interesting that you say it has changed a lot. I mean certainly from what [Farman] wrote about in [2012], the way he wrote about it seemed really underground, seemed really kind of casual.

Interviewee #13
Okay, so that's something slightly different and that's the Singularity Institute and the Singularity University, two quite different things… The Singularity University paid the Singularity Institute to stop using the term singularity. So, they changed their name to MIRI Machine Intelligence Research Institute, but I went to a Singularity Institute event as well in about 2009 or 2010 and it was wonderful. Yes.

Dayna
And was it a tech conference, or was it like people speaking about transhumanism and the singularity?

Interviewee #13
There were people talking about transhumanism and the singularity, mainly. The Singularity University was more about some remarkable people doing entrepreneurial stuff with exponential technologies.

Dayna
Yes, yes. So, I went expecting what you're describing, and I got the very entrepreneurial side. And I mean it was basically a tech conference and I was quite blown away because it wasn't quite what I was expecting. And it was really about finding investments for startups and things like this.

> Interviewee #13
> Yeah, the way to save the world is to find a business opportunity where you can change a billion people's lives.

Interviewee #13 described the distinction between the Singularity Institute for Artificial Intelligence, which was founded in 2000 by Eliezer Yudkowsky. Its purpose was research on the accelerating development of AI. As described by Interviewee #5, Yudkowsky became increasingly concerned about AI systems safety, especially existential risks to humans, from a singularity or superintelligent AI. In 2005 the institute moved to Silicon Valley and began focusing on identifying and managing those risks (Khatchadourian, 2015). In 2006, the institute organized the Singularity Summit, (not to be confused with the Singularity University Summit), to discuss the future of AI, including its risks. The summit was funded by Stanford University and Peter Thiel (Abate, 2007). In 2012, the institute sold its name, web domain and the Singularity Summit title to Singularity University, and promptly reimagined itself as the Machine Intelligence Research Institute (MIRI) (Singularity University, 2012).

MIRI operates today with a mission "to develop formal tools for the clean design and analysis of general-purpose AI systems, with the intent of making such systems safer and more reliable when they are developed." (*https://Intelligence.Org/About/*). MIRI focuses on addressing known and unknown safety issues surrounding artificial general intelligence systems (AGI), which contrasts to the AI that exists today, which is known as narrow AI. Narrow AI is programmed to perform one specific task very well, for example, Apple's Siri, or more contemporarily, Chat GPT or DeepSeek. Even though these generative AI models display intelligence beyond human knowledge in their ability to answer any question, these programs use natural language processing to create dialogue and answer questions, which is illustrative of narrow AI. AGI does not yet exist, but it is being worked towards, it is thought to be AI that can perform any cognitive tasks that

humans can, as well as colloquially understood to contain some type of self-awareness and common-sense skills. Therefore, MIRI seeks to mitigate the potential risks of AGI. “Researchers largely agree that AI is likely to begin outperforming humans on most cognitive tasks in this century. Given how disruptive domain-general AI could be, we think it is prudent to begin a conversation about this now, and to investigate whether there are limited areas in which we can predict and shape this technology’s societal impact.” (*https://Intelligence.Org/About/*).

4.3.7 Conclusion

This section has discussed the major events in modern transhumanist history, as told by transhumanist actors, that have led to its formalization and institutionalization as well as the events that have taken place since. It is important to understand that while many of the research institutes and transhumanist initiatives no longer associate strongly with the label of transhumanism, many of these projects still exist today under different names. Additionally, transhumanist future visions continue to be worked towards, such as AGI and human longevity, under different research agendas. For example, as examined in chapter 7, longevity is becoming taken up in the medical field, if in its very early conception.

4.4 Conclusion

This chapter has provided narrative literature review through a self-told history of major historical events that has led to the formalization and beyond of transhumanism. The narratives and claims provided here are not indicative of an exhaustive transhumanist history and is representative of the major events that are represented throughout transhumanist literature as well as empirically from interview data with transhumanist actors. Transhumanist has a rich history, which I argue in the next chapter is quite short, despite the links to historical inspirations within transhumanist internal histories. In providing a narrative history, I have provided more than a

simple history of transhumanist but provided a glimpse of the complexity of dynamics within and between transhumanist groups as well as between transhumanist and non-transhumanist social groups. This chapter has illustrated how knowledge, specifically in this case, transhumanist narratives become and have become produced. I have also grappled with boundaries of subjective/objective historical claims and the meaning of what counts as expertise through privileging both primary, or empirical data, as well as secondary sources, such as other academic analysis. This chapter has allowed for a transhumanist history as told by transhumanist actors which provides important and intimate context for the following analytical chapters.

I argue throughout the following chapters that the label of transhumanism is no longer fashionable and that many who once identified as such, now identify with other labels. However, understanding the influence of transhumanism, while understanding the influence it has had on contemporary technological visions of the future is important. O'Gieblyn (2017) captures this importance when they argue:

> Transhumanists today wield enormous power in Silicon Valley – entrepreneurs such as Elon Musk and Peter Theil identify as believers – where they have founded thinktanks such as the Singularity University and the Future of Humanity Institute. The ideas proposed by the pioneers of the movement are no longer abstract theoretical musings but are being embedded into emerging technologies at organizations such as Google, Apple, Tesla and SpaceX. (para. 14)

What were once science fiction future visions are becoming real and at stake is the safety of our futures. The following chapters will examine the social implications of transhumanist future visions, focusing on how these visions influence social and financial investment decisions surrounding technological innovation as well as how these visions become configured materially.

Chapter 5: Transhumanist Future Discourses

5.1 Introduction

The previous chapters examined my methodological design for this project which included qualitative interviews with both transhumanist actors as well as non-transhumanist actors who work in fields relevant to technological innovation. Previous chapters also examined relevant theoretical contributions from science and technology studies literature, namely sociology of expectations literature, which centers the future as an important object of inquiry. Focusing on the case study of transhumanism, the following chapters utilized the sociology of expectations literature as a theoretical framework to examine what types of social impacts technological future visions have as well as how they become configured materially. A brief history of transhumanism was also examined in order to provide context for the following empirical and analytical chapters. The previous chapters have therefore provided context and information for the reader in the relevance and execution of this project.

This chapter is framed by two core values within transhumanist narratives; the assertion that transhumanist values have always existed, or that we have always been transhumanist and that transhumanist values are inherent, or that we are all transhumanist and just do not know it yet. This chapter unpacks core values within both assertions made by transhumanist interviewees.

The first part of this chapter argues that because transhumanist narratives have become somewhat pervasive within present media/culture, transhumanist internal histories are deterministic and anachronistic, whereby present transhumanist values are placed within historical technological examples. The second section of this chapter then argues that the meaning and value of transhumanism has changed over time, whereby the label of transhumanism means little beyond a personal identification.

After looking at historical examples, I then turn to contemporary transhumanist discourses where I examine the transhumanist assertion that transhumanists values are inherent human values. I argue that this sentiment further normalizes the idea that transhumanist desires are and have always been natural or inherent human desires. I critique this assertion by arguing that future technological visions becoming pervasive within Western culture does not make transhumanist values inherent. The meaning of transhumanism has changed over time and has a multiplicity of meanings. The need to create and hold space for distinctly transhumanist values, for example, the proactionary principle, establishes that although these visions are becoming normalized, they are not inherent human desires.

In this chapter I argue that internal transhumanist histories place importance on historical events and objects that have come to influence the formalization of transhumanist ideologies in the late 20th and early 21st centuries. I argue that the ways in which these historical narratives are used present anachronistic fallacies which serve to legitimate and normalize accelerating technological ideological and philosophical future visions. Transhumanist discourses rely on normative narratives of technological progress logic to appeal to social capital and financial investment. While transhumanist visions are becoming more popular, the transhumanist movement has not become widely adopted. I therefore examine how the label of transhumanism is used today and argue that the meaning that the label used to hold has changed over time and ultimately diminished.

5.2 Identifying Core Transhumanist Values

5.2.1 Introduction

'Proto-Transhumanism' denotes thinkers and scientific and technological ideas from before the pre-formalization of, or a primitive form of what is now commonly known as transhumanism. Historian of transhumanism, Bohan (2018) classifies proto-transhumanist thinkers as those who "believed that many aspects of human nature, biology and culture could be altered, enhanced, or overcome, using technology and human ingenuity." (p. 22). Characteristics of proto-transhumanists, according to Bohan (2018) require that "thinker expressed sentiments that directly foreshadow more than one core theme in modern transhumanist thinking, from life-extension, materialism, the belief in progress and perfectibility through science, and the overcoming of biological constraints on human nature, to the potential to one day overcome death." (p. 25). Drawing from literature on retrospecting expectations (Brown and Michael, 2003), I argue, however, that it is problematic to retrospect contemporary transhumanist values into antiquity.

This section examines transhumanist discourses surrounding technological progress narratives within the human/technological relationship. First, I analyse the implications of normative technological progress narratives through transhumanist future visions and internal transhumanist histories, which transhumanists call proto-transhumanism. Transhumanists use proto-transhumanism to denote the pre-formalization or a primitive form of what is now commonly known as transhumanism. Examples of proto-transhumanism are analyzed through normative technological progress narratives, wherein transhumanists frame historical technological innovation within contemporary notions of the human/technology relationship. I argue this is a fallacy of anachronistic thinking, meaning a chronological inconsistency, where an object, person or thing is misplaced in history. Additionally, I examine the implications of proto-transhumanism,

which implies an innate human desire for technological human enhancement. Because transhumanist internal historical narratives implicitly associate transhumanist sentiment into antiquity, these narratives create a normalization within the implication that we have always been transhumanist.

Then this section examines the social, temporal and technological relationships within proto-transhumanist histories. These types of internalist histories are problematic in that they are technologically deterministic. The examples that serve to provide legitimacy and history to the transhumanist movement rely solely on technological developments and do not consider the co-evolution of complex sociotechnical relationships. Additionally the implications of proto-transhumanism and normative technological progress narratives will be examined through Brown and Michael's (2003) retrospecting prospects framework which focuses on what can be learned by looking back on expectations that were once held for the future. I argue that the temporality of invention is a key aspect in the social and technological relationship.

Finally, this section examines some rare examples of reflexivity within proto-transhumanist histories that demonstrate transhumanists reflecting on and taking into account historical changes over time, which I argue is an exception to the rule, in that proto-transhumanism narratives are determinist, and generally do not take social changes over time into consideration.

5.2.2 Proto-Transhumanism and its Implications

In addressing core transhumanist values, I argue that transhumanists have created internal histories that trace transhumanist visions far beyond the formalization of the transhumanist philosophy in the late 20th century. Therefore proto-transhumanist narratives commit the fallacy of anachronistic thinking, by tracing transhumanist values into ancient humanity, thereby normalizing the blurred boundaries between technology and humans. The blurred boundaries between human

and technology, however, is a modern phenomenon (Borup et al., 2006; Jasanoff, 2015). Tracing transhumanist narratives into antiquity attempts to normalize transhumanist visions which suggest that there is an inherent human desire to improve or augment ourselves through technological means. While I am not arguing against the idea that humans have always desired and sought to improve themselves, I am arguing that associating ancient or far-past technologies with transhumanist values presents anachronistic and technologically deterministic thinking, which is used in a strategic way of normalizing transhumanist visions.

Ascribing transhumanist or posthuman desires into antiquity is problematic, in that both transhuman and posthuman as terms were formalized within recent history. Transhumanism was coined by Julian Huxley in 1951 and posthuman became formalized in the early 1990s, with few mentions of the term prior to 1990, as argued by Doat and Dorthe (2023) and Thomesen and Wamberg (2023) respectively. While 'proto-transhumanism' denotes pre-formalization or a primitive form of what is now commonly known as transhumanism, ascribing transhumanist values on antiquated technology displays technological determinism as well as anachronistic thinking. Both of which, within this case, rely on normative progress logic, wherein the belief in scientific and technological progress is taken for granted. Selin (2008) argues "the rhetoric supporting new technologies derives legitimacy … from the widespread belief in the determinacy of scientific and technological progress." (p. 1879).

Sociology of expectations literature can therefore aid in making sense of these normative historical claims, in that sociologists of science and technology recognise the engrained progress logic in both. According to Collins and Pinch (1993, 1998), as cited in Van Lente (2012), "both [science and technology] are ruled by the belief that there will be a 'next step.'" (p. 775). This belief in progress through science and technology assures that there will always be a next version

of product, system or knowledge (van Lente, 2012). This belief within science and technology permeates future expectations, in that a belief in the next technological development/version becomes so ingrained that it becomes normative.

Transhumanist discourses reflect popular narratives of progress, relying heavily on the idea of progress as quantified through technological innovation, as argued by Hurlbut and Tirosh-Samuelson (2016). While transhumanist visions may sound radical, they become grounded in a widely held narrative where social progress and technological progress become inseparable. According to Boenig-Liptsin and Hurlbut (2016), transhumanist narratives extend the commonplace technological progress logic beyond near-term outcomes, advocating for the technological transformation of our very understanding of humanity itself. As per Boenig-Liptsin and Hurlbut (2016), transhumanist narratives draw heavily on normative tropes about the human benefits of technological progress that are very familiar, whereby technology is seen as the primary agent of social progress.

I encountered the use of this type of historical technological progress narrative throughout my interviews, as illustrated with Interviewee #10 and #12. In discussing technological regulations along with the precautionary vs proactionary principles, Interviewee #10, a leading thinker within transhumanism, illustrated innate transhumanist desires using the pointedly historical example of human discovery of fire.

> The precautionary principle puts all the emphasis on what could go wrong with new procedures, new technologies. And if we've actually applied that throughout history, we would not even have fire, right, because fire pretty obviously has danger. It's very dangerous. If they had said, well you have to produce an impact study over the next 10 years and show how to use fire completely safely, well we would never have fire. We wouldn't have transport; we wouldn't have energy use of any kind. So, it's obviously just an unrealistic principle, with the proactionary principle … starts from the principle that progress is desirable, it makes life better. Now, there'll be side effects from that and so we need to make smart decisions about how we develop these and implement them, but that's going to be based

> upon reason and not on fear, we've got to use the best decision-making principles, look at costs and benefits. (Interviewee #10)

The proactionary principle, written by Max More (2013b), challenges the precautionary principle, which describes balancing benefits versus risks within technological innovation. Transhumanists lean towards the proactionary principle, which focuses on the potential benefits of technological innovation, as opposed to the precautionary principle which focuses primarily on potential risks. In this sense, Bohan (2018) argues that "transhumanists care more about the pursuit of longer, healthier lives, better decision making, and attaining greater mastery over nature, than they do about preserving humanity-as-we-know-it. They readily entertain the possibility that new experiences and value systems could have more to offer than our normative values, capabilities and lifeways." (p. 12).

Interviewee #10 discusses some of the core values of transhumanism, namely that technological progress is desirable. They use a particular historical example of human's use of fire, which, if not explicitly, implicitly evokes the meaning of early humans' discovery of fire. Here, Interviewee #10 uses a historical example to illustrate the modern concept of the proactionary principle, displaying an anachronism. This type of fallacy provides the appearance of a longer history than formalized transhumanism has. Drawing on the ability to control fire, Interviewee #10 creates a sense of the proactionary principle as an inherent quality that has always existed, and that the precautionary principle is a fear based around contemporary technology. There are many ways in which Interviewee #10's example could have been framed; however, these particular historical examples are written by transhumanists as part of their internal history.

Additionally, Interviewee #12, an engineer and a transhumanist advocate who is active in many different transhumanist social and political groups, illustrated the transhumanist concept of the proactionary principle as well as demonstrating determinist thinking in their explanation of

continuous technological advancement and a classic transhumanist anachronistic fallacy, in labeling the human control of fire as transhumanist.

> Where I see transhumanism going is, the face of it will change as we move forward, because everything around us is moving forward. It doesn't stop at the singularity, for example. It doesn't stop when AI is running all the automatic systems that we might have in the world … It's a continual process because on a very broad looking viewpoint we've been transhumanists since we invented fire and maybe even before that. But I can consider fire to be the first major technology that humans conquered. And we just now have a term that we're talking about, because we have a group of people that want to continue us in that, and that don't get caught or mired down into all the things that could go wrong. [We don't say] let's slow technology down so that it doesn't go any faster than I can assimilate it. But of course, the problem with that is all the lost opportunities that we have going forward, and that opportunity going forward is more than lost technological opportunities. It's human, going back to aging or going back to any disease. If we slow technology down to where we can integrate with it at our slower speed, and it takes us an extra 50 years to cure cancer. What was the human cost of those 50 years? So, we need to keep all of that in mind. (Interviewee #12)

Interviewee #12's comment is illustrative of the underpinning of normative progress narratives, technological determinism and anachronism laden within transhumanist discourses and histories. The taken for granted continuation of technological progress displays determinism, or what in expectations literature is referred to as 'lock-in.' Konrad et al. (2016), citing Konrad (2006) argue that "expectations can even turn into taken-for-granted assumptions of what is going to happen, thus falling into a deterministic lock-in, where future states become not just a promise but an inevitability." (Konrad et al., 2016, p. 469). Not only does Interviewee #12 take for granted the progress in future technological progress, in their description of constantly evolving technology, they also argue we have always been transhumanist and only just within the last few decades have language to speak about it. This example is illustrative of deterministic lock-in, where not only the future has become locked into inevitably technological visions, however, the past has been altered to fit within this narrative of constant technological progress and transhumanistic thinking.

In regard to lock in, Tutton (2017) argues that the resources for the materialization of some visions exclude others from coming to pass. “Every materialized future leaves traces that cannot be undone (pace Rittel and Webber [(1973)]), these traces can become path dependencies that ‘lock in’ certain options and become irreversible because resources used in one way cannot be used again. Each future followed is another future not taken.” (Tutton, 2017, p. 487).

Berkhout (2006) argues that, “some expectations become so widely shared that they acquire a normative force, in the sense of being expressed as an entitlement. ... At that point expectations cease to be malleable and become facts that predictably influence present-day behaviour, and so become self-fulfilled.” (p. 302). Interviewee #12 displayed this type of determinacy through their belief in both future technological trajectories as well as particular past motivations, wherein an example of human discovery of fire is claimed within particular transhumanist motivations. A further example of this self-fulfilling prophecy could be thought of as Moore’s law, wherein it is predicted that the number of transistors in an integrated circuit doubles roughly every two years, and then that expectation becomes a lived reality in that it is now an expectation that becomes strived for. Therefore, progress of scientific and technological innovation is a normative future expectation that becomes taken for granted within Western cultures. Boenig-Liptsin and Hurlbut (2016) as well as MacFarlane (2020) argue that these taken for granted technological progress narratives frame transhumanist discourses, thereby attempting to normalize them.

I discuss the theoretical concept of retrospecting prospects in detail in the theory section 2.5.2.1, where I outlined the implications on present future visions from reflecting on past future expectations. In ‘retrospecting prospects,’ Brown and Michael (2003) look at “how actors contextualize their present futures in relation to their narratives of the past future, that is, their retrospections on futures that failed or succeeded in being realized.” (p. 7). The characteristics of

retrospecting prospects according to Brown and Michael (2003) are technological determinism and rearranging expectations retrospectively to fit contemporary narratives. "There is an overwhelming tendency retrospectively to account for success or failure by referring to the properties of a technology or artifact rather than other equally important factors. Just as common is the retrospective tendency to redefine prior expectations to fit in with the way things turned out." (Brown and Michael, 2003, p. 6).

The concept of retrospecting prospects aids in examining the examples of internalist transhumanist histories. While these histories do not exemplify failed futures as such, the examples transhumanists use to legitimize a history exemplify some of the pitfalls of retrospective tendencies, such as technological determinism and redefining expectations in the present in that they remove technological examples from broader social contexts as well as redefining prior expectations to fit with contemporary narratives and agendas, both of which display anachronistic thinking. Transhumanist histories prior to the late twentieth century formalization focus solely on technological innovation, as Geels & Smit (2000b as cited in Brown and Michael, 2003), describe, this technologically deterministic lens sidelines other considerations, namely the co-evolution of complex social and technical relations. Poignantly, these transhumanist histories offer prime examples of redefining prior expectations, or historical technological developments, to fit within a particular present or future narrative. This is seen in transhumanists associating transhuman values onto historical technological developments, like *The Epic of Gilgamesh* or European alchemy.

I have illustrated anachronistic fallacies within transhumanist internal histories using examples from the empirical data collected for this project. Transhumanists use these historical examples to normalize their visions for the future.

5.2.3 Transhumanist Visions: Beyond Normative Progress Logic

Transhumanists push normative technological progress narratives beyond what we may recognize as human boundaries through technological enhancement. MacFarlane (2020) argues that transhumanist's use these normative values, or technological progress logic, to trace a history of transhumanism back to early human civilization, which I illustrated in the history of transhumanist section in chapter 4. Internal transhumanist histories look to examples of human's desire for transcendence to trace transhumanist values throughout history, which, I argue, implies innate human transhumanist desires have always existed, furthermore, I argue that these claims display an anachronistic fallacy, which means a misplacement of contemporary narratives inconsistently throughout history.

MacFarlane (2020) argues that internal transhumanist histories trace human desire for transcendence as far back as humanity itself, thereby normalizing discourses surrounding technological progress as human progress. These discourses of technological progress are often spoken about with a near certain inevitability, technological determinism or lock-in, while simultaneously ascribing transhumanist values into the past and future. Alvial-Palavicino (2016), citing Konrad (2006), argues: "these collective expectations gradually become taken for granted, as if they were a self-evident statement that does not need to be justified." (Alvial-Palavicino, 2016, p. 140).

Within transhumanist narratives and histories, proto-transhumanism ascribes human progress as valued through technological progress throughout history, while transhumanist values tie future human progress directly to technological innovation. One reason to do this, I argue, is to make these future visions more normative. According to Michael (2000), pasts are also incorporated into representations of futures, he argues that drawing on traditional aspects, past or

current representations of future visions calls these visions closer, making them less distant and less alien, by relying on familiarity even if in small part. Therefore, the normative desire and belief in progress is familiar within these transhumanist visions, even, whereby the visions become far future or extreme in the way they conceptualize the relationship between human and technology.

For example, both Bostrom (2014) and Dvorsky (2022) argue that in an effort to trace the cultural and philosophical roots of transhumanist thought to ancient humanity, transhumanists point to the Mesopotamian *Epic of Gilgamesh* as the earliest written example of the quest for immortality. This example is illustrative of transhumanists claiming that human's curiosity and desire to acquire new skills and transcend human limitations is as old as humanity itself. More (2013a) makes a similar claim in labeling the philosophy of European alchemy of the thirteenth to eighteenth centuries as proto-transhumanism. "Their search for the Philosopher's Stone or the Elixir of Life looks like the search for a magical form of technology capable of transmuting elements, curing all disease, and granting immortality." (More, 2013a, p. 9). Therefore, I argue, not that these desires have not existed throughout humanity, but that labeling them transhumanist is problematic.

Interviewee #4, a British transhumanist specializing in ethics, illustrated my argument by describing the convenience of associating transhumanism with technological innovation.

> In practice, at the risk of sounding like a naive, technological determinist, a lot of these technologies are happening anyway, and one can give them the label of transhumanist, but it is not as though the development of AI is being done under the rubric of transhumanism. I mean, yeah, calling it transhumanism is extremely convenient but that's not why it's being done. (Interviewee #4)

Interviewee #4 described the association with innovative technologies as convenient for transhumanism. The implications of the broad use and meaning of the term transhumanist will be thoroughly examined within the next chapter, however, here I argue that because the meaning of

transhumanism is multi-faceted and interpreted in a wide variety of ways, transhumanist values can be grafted onto current and past technological developments, because transhumanism has a flexible and broad value system. This, as Interviewee #4 described, is convenient in giving strength to current transhumanist claims as well as past transhumanist histories.

Macfarlane (2020) argues that these claims made by transhumanists suggest that there has been an eternal longing since the beginning of humanity for a 'transhumanist-type' self-transcendence. These types of claims are common and widely supported within the internal histories produced by supporters of the movement, according to MacFarlane (2020). Transhumanists call these histories proto-transhumanism. Proto-transhumanism serves to normalize this type of technologically focused humanism by looking to historical examples that showcase transcendence as desired through technological means. These claims suggest that there is an inherent human longing since the beginning of humanity for a 'transhumanist-type' self-transcendence. MacFarlane (2020) argues that these types of claims are common and widely supported within the internal-histories produced by supporters of transhumanism.

In this section I have further illustrated anachronistic fallacies and determinist thinking within transhumanist internal histories using critical scholarship. Transhumanist discourses use normative progress logic to cultivate legitimacy and investment in their future visions.

5.2.4 Transcendental Desires: Temporal and Socio-Technical Relationships

In illustrating that humans have always coveted improvement through technology, Jasanoff (2016) argues that humans have always sought to escape their fallibility through the use of technology. Furthermore, in the quest for transcendences, Jasanoff (2016) argues, "religious or secular, humanity's dreams of the future have always been posthuman. As long as people have tried to fathom the reasons for sorrow and evil, they have also looked for ways of transcending the

bitterness of being human." (p. 73). While Jasanoff (2016) uses transhuman and posthuman interchangeably, they recognise that there are nuances between the two terms. Jasanoff (2016) therefore argues that humans have long sought to overcome human fallibility through the use of technology. However, humanity's relationship to technology has changed over time. While some view the blurring of the human/technology relationship as a contemporary aspect of posthuman desires, Jasanoff (2016) argues that it is our technological achievement along with our understanding of what it means to be human that has changed over time. These aspects, Jasanoff (2016) argues, are what make these transcendent desires contemporary, in that: "with those changes also our imagination of what lies beyond, or after, humanness as we know it." (Jasanoff, 2016, p. 74). Therefore, how we understand the meaning of human as well as the vision for transcendence through technological means as well as the possibilities they open is what has changed over time.

As discussed in chapter 3, human desire to control or invest in particular visions of the future is not a new conception. What is contemporary is the technological lens through which human progress is now measured. "The dream of escaping the burdens of the human condition is older than old." (Jasanoff, 2016, p. 73). Jasanoff (2016) explains that what makes contemporary transhumanist sentiments novel, is not the idea of overcoming human limitation, but in the blurring of the boundaries between human and machine. Referencing the tale of Icarus flying too close to the sun on wax wings, Jasanoff (2016) argues that technology has always played a part in humanity's transhuman dreams. What has changed over time are technological achievements, as well as the understanding of what it means to be human (Jasanoff, 2016). What has changed throughout time is what we understand as the meaning of human, especially through the human/technological relationship, as we understand ourselves in relation to our technologies.

While Jasanoff (2016) explains that humanity's dreams have always contained aspirations to move beyond the fallibility of being human, Borup et al. (2006) argue that discourses of technological progress are, in fact, a modern phenomenon. As discussed above, human desire to improve themselves is not a new phenomenon, but the way it is imagined to be achieved, through a technological lens, is what is new. This perspective can only be achieved through taking account of the sociotechnical relationship, as opposed to only the technical, and through examining changes over time.

> From within the history of technology there are important accounts of how expectations change over time, and particularly longer time spans, in relation to various 'real time' factors [(Levin, 1989; Marvin, 1990b)]. This shows, for example, that expectations tend to reflect current conceptions of technological utility or, as Marvin puts it, 'the tendency of every age to read the future as a fancier version of the present.' [(Levin, 1989; Marvin, 1990b)]. (Borup et al., 2006, p. 288)

As Borup et al. (2006) argue, expectations or our visions for the future, tend to reflect current conceptions of technological development. The ability to see beyond our present technological conceptions is a skill many transhumanists are proud of, in that they often can see beyond what is possible in the present, a skill they claim non-futurists do not have. Many transhumanists criticize non-transhumanist actors for not thinking broadly enough about the future. However, this futurist skill of thinking forward has impeded transhumanists in thinking about the past. In writing current conceptions and technological values into the past, they often do not consider social and technological changes over time. This is exemplified in the internal transhumanist histories, where technological objects are said to uphold transhumanist values, such as the claim of human discovery of fire, the Epic of Gilgamesh, or the search for the elixir of life. The social processes of these technological innovations are not considered.

Transhumanism integrates normative progress logic into visions because it is familiar. Doat and Dorthe (2023) argue that Huxley's original conception of transhumanism adopts this type of logic.

> This belief [Huxley's transhumanism, aka, humans can transcend themselves] resonates with an American public imbued with technological utopianism, which has religious and philosophical roots since the nineteenth century (Noble, 1999). The transhumanist movement in the United States derives from this widely distributed idea that technology could and should drive humanity's fulfilment. (Doat & Dorthe, 2023, p. 695)

Important to note, however, is that as according to Fuller (2021), 'innovation' has not always been synonymous with productivity and wealth. "Recall that until the mid-nineteenth century, 'innovation' was normally taken to mean 'monstrosity' in the pejorative sense of, say, Mary Shelley's [(2008 [1818])] *Frankenstein*. It was only once industrial innovations started to boost the Europeanized world to unprecedented levels of productivity and wealth that the relevant value reversal took place." (Fuller, 2021, p. 675). As argued below, the temporality of a term's meaning as well as considering historical and social timeframe in which a technology was developed is instrumental in considering its implications and in not committing anachronistic or deterministic fallacies.

Bohan (2018) argues that transhumanism is a product of its time, arguing that while transhumanism has a long history of influence, which is coherent with earlier transcendental thinking, there is a distinctive epistemological foundation within transhumanism that is built on a modern scientific worldview.

> Transhumanism has a long prehistory dating back to the Scientific Revolution. Transhumanist projects of human enhancement are arguably continuous with all past forms of technological innovation, and the many transcendental aspirations in human history that are apparent in pursuits like art, religion and alchemy. As the leading transhumanist James Hughes writes:
>
> Transhumanism has much in common with spiritual aspirations to transcend animal nature for deathlessness, superhuman abilities, and superior insight, though

> transhumanists pursue these goals through technology rather than (or at least not solely) through spiritual exercise. [(Hughes, 2010)]. (Bohan, 2018, p. 13)

Both Bohan (2018) and Hughes (2010) make a distinction between proto-transhumanism, or influential ideas and thinkers surrounding transcendence, and the definitive epistemological influence of a modern scientific worldview inherent within transhumanism. While Bohan (2018) uses 'transhumanism' to describe the prehistory of the philosophy, as opposed to proto-transhumanist, they clearly make a definitive distinction about the modern scientific influences in which transhumanism finds its foundations, as opposed to earlier transcendental inspirations, on what is definitively defined as proto-transhumanism.

Bohan (2018) further argues:

> Like all other ideas and movements, transhumanism is a product of its time. Transhumanist ambitions of radical life extension, brain uploading, intelligence augmentation, and space colonisation, could not be taken seriously as realistic projects before the invention of modern computers and rockets, the discovery of DNA, or the rapid increases in computing power and the declining cost of computation—all of which took place in the twentieth century and led us to the present period of networked computing, pervasive artificial intelligence, escalating automation, and ever more rapid technological change. (Bohan, 2018, p. 14)

Bohan (2018) argues that transhumanism, despite having historical influences, is a product of its time. I argue, therefore, that transhumanists conflate future visions with past motivations, mapping transhumanist values and motivations onto technologies that pre-date the philosophical formalization of the movement itself.

Furthermore, these historical examples are also removed from their broader social context. Brown and Michael (2003) argue that removing broad social context sidelines other considerations, namely the co-evolution of complex social and technical relations. Brown and Michael (2003) as well as Borup et al. (2006) discuss the importance of taking into account the historical trajectory, for instance in terms of the history of technology or how expectations change

over time, emphasizing looking at longer time spans in order to analyze trends over time. Borup et al. (2006) argue that, "this shows, for example, that expectations tend to reflect current conceptions of technological utility" (p. 288).

Similarly, Selin (2008) argues that while the materiality of technological innovation has the power to shape the future, this influence of technology is co-produced (Jasanoff, 2004) alongside the influences and shaping of the social.

> Whether as autonomous intelligent robots, new forms of bacterial life, photovoltaic material, or molecular manufacturing, the technologies included under the rubric nanotechnology promise to alter the way we live, work, love and die. Yet, this promise of progress seems to forget the social dimensions of technology. As society adopts, rejects, uses, and modifies such technologies, it is likely that power relations will shift, new social identities will emerge, and the meaning of inequality will change. So while the actual production of new technologies may affect the contours of the future, technologies develop in tandem with society's production of meaning. (Selin, 2008, p. 1879)

Because transhumanist histories solely track technological innovation, and do not account for social changes, or even technological changes over time, these histories are static and technologically determinist. This represents an example of the fallacies of retrospecting, in that transhumanists are looking for historical examples to provide legitimacy for their worldview but using contemporary technological progress narrative to do so. This makes transhumanist visions appear as normative human desires.

5.2.5 Reflexive Pasts

While academic literature on transhumanism is for the most part written by transhumanists, Elise Bohan, an academic historian wrote their thesis concerning a historical accounting of transhumanism, entitled, *A History of Transhumanism* (2018). While Bohan considers her worldview largely transhumanist leaning, they are not a transhumanist actor. Bohan (2018) argues that existing literature on transhumanism, especially the history of transhumanism from non-

transhumanist actors is nearly nonexistent. “Most scholarly works on transhumanism are journal articles written by transhumanists. The next two largest groups of authors on the subject are probably philosophers and theologians.” (Bohan, 2018, p. 19). Furthermore, Bohan (2018) argues for the benefits of the reflexive position of the non-transhumanist scholar, arguing that throughout her research on the history of transhumanism, she has encountered texts that, were she a transhumanist, she would not have included. Bohan (2018) argues that a non-transhumanist academic history has the benefit of the author being less likely to censor any aspects of transhumanist history or narratives that may present it as less credible to an outsider’s perspective. Bohan (2018) states: “I have found many sources that I would consider censoring if I was an early transhumanist thought leader writing this history, and it is notable that these sources are absent from all other scholarship on transhumanism.” (p. 19).

This reflexivity on their positionality as well as the effort to not censor this important history is apt to highlight rare reflexive opinions I found in my interview data. Borup et al. (2006) argue that the expertise of claims in the form of expectations translate into normative progress logic beliefs. “Expectations have the appearance of greater authority for those who see themselves as having little influence over the outcome of a promise (publics for example). This easily translates into a normative framing of expectations: ‘it’s going to happen so you might as well get used to it’!” (Borup et al., 2006, p. 292). Interviewee #13, a U.K. based transhumanist, futurist, writer, and pioneer of information and communication technology, reflectively spoke about the inevitability sentiments that some transhumanists hold:

> There are inevitable-ist transhumanists who say the victory of transhumanism is inevitable. And there used to be pictures around the internet saying such a thing. Rah rah rah, like Marxists used to say that proletariat revolution was inevitable. And once you understand society from a certain way you should just hurry up and revolt and you're bound to be on the winning side of history. And it's like some

> religion is, millenarian or whatever says, you know it's bound to come. So, there is some aspect of that. (Interviewee #13)

Interviewee #13 offers a critical view of some taken for granted transhumanist values. In this sense, an inevitable outcome of transhumanist visions is dominant in many narratives surrounding future visions. Interviewee #13 offers a rare and important reflection which argues against determinist thinking.

Interviewee #9, a technologist, philosopher and leader within a social religious transhumanist group, offered a rare reflexive view on the internalist histories within transhumanism, stating that, "a lot of Transhumanists are really bad at history…., maybe it's partly because they like to focus on the future and they're better at technological trends than they are at historical realities." (Interviewee #9). They continue to say that transhumanism, although rarely acknowledged as such, is deeply influenced by religion. "Yes, like it should be obvious. But it's evidently not that religion has deeply informed the origins of Transhumanism. Deeply!" (Interviewee #9). They go on to give a detailed list of examples on proto-transhumanist histories such as Pierre Teilhard de Chardin and Nikolai Fedorov. Based on Interviewee #9's reflection, I argue that the future forward focus of transhumanism, may help account for the anachronistic thinking taking place within transhumanist historical narratives. While many transhumanists are concerned with the social and ethical risks implicated within the technologies of their future visions, these considerations are not considered for past technologies. Interviewee #9 explains that transhumanists track technological trends into the future and offers a counter to the normative view within transhumanism on past social influences, such as on the work of Teilhard de Chardin and Fedorov, including their philosophies and ideas, as opposed to focusing solely on technological inventions.

As argued above, a reflexive positionality on transhumanist histories are often counter assertions that what the dominant narratives proport. Reflective stances on the past were rare amongst interviewees. While I cannot fault futurists for not also being historians, not reflecting deeply enough on the social and technological relationship throughout history, but invoking technological innovations with transhumanist values, I argue is problematic, in that it reflects determinism and anachronistic thinking.

5.2.6 Conclusion

This section has examined the use of normative technological progress logic narratives as used within transhumanists' future visions. The section has been framed by transhumanists core values. I have argued that while proto-transhumanism presents historical narratives that makes transhumanist values seem innate, this is an anachronistic fallacy. Transhumanist values are not inherent, and transhumanism is a modern conceptualization with historical influences.

Above, I have argued that because the formalization of transhumanism is relatively new, transhumanists retrospect, or look back on prior technological innovation with contemporary (and futurist) values and lenses. To summarize, transhumanist histories place contemporary transhumanist values onto past technological innovation. These histories do not consider wider socio-technical perspectives changing over historical timeframes, but instead prescribe an innate desire of technological mastery throughout human history. Illustrative examples include associating European alchemy or control of fire within transhumanist histories. This type of reflection anachronistically ascribes current and future visions of technological innovation on past inventions. And, because the wider socio-technical perspective is not being considered, rather only technological, these internal histories point to technology that appears to embody contemporary innovative qualities but applies contemporary normative progress logic on past phenomena.

5.3 The Spread of Core Transhumanist Values

5.3.1 Introduction

In building on the discussion of normative technological progress logic, this section discusses the normalization of transhumanists discourses contemporarily and culturally. While the term 'transhuman' has arguably become less popular since its formalization in the late twentieth century, according to many interviewees, transhumanist goals and sentiments have become widely adopted over time. Building on the arguments exploring core transhumanist values above, this section addresses transhumanist claims about how these core values have spread into a wider cultural narrative surrounding technological innovation, by examining interviewee assertions that transhumanism is inherent.

The previous section argued that proto-transhumanism frames internal transhumanist histories that serve to exemplify that technological enhancement or improvement are an inherent human desire. These histories serve to normalize the blurring of the boundaries within the human/technology relationship. This section examines how, according to transhumanists, these discourses have become normalized and pervasive. This process of normalization highlights a tension where interviewees describe that these visions are becoming/have become more recognizable in mainstream media, while simultaneously the term 'transhuman' itself remains particularly niche and marginalized. Invoking sociology of expectations literature, this section examines the implications of transhumanist visions permeating culturally, and therefore also analyzes the relevance of the label of transhumanism.

First this section examines the implication of transhumanist vision becoming pervasive while the term remains marginalized. I examine how transhumanists are understanding the changing meaning and value of the term. I then argue that transhumanism has lost value over time

because of advancements in technologies, celebrity uptake of similar goals, as well as many transhumanists themselves no longer continuing to self-identify as such. In that transhumanism has lost value over time, I argue that the term holds little meaning outside of personal identification, an argument that will continue to be explored throughout the following chapters.

5.3.2 Transhumanism Has Become Pervasive

In examining the transhumanist narratives that suggest their core values are inherent; this section explores the way in which transhumanists themselves understand their future visions having permeated into western culture. The reason transhumanist future visions have become normalized over time, is in part because transhumanist visions are based in normative values associated with technological progress. This section will examine the contemporary implications of the pervasiveness of these visions. Another reason I explore as to why transhumanist future visions have become more normalized is the support of celebrities and popular figures within western culture and media. Above I argued about the historical narratives of transhumanists, here I am examining contemporary transhumanist discourses.

One of the reasons transhumanist narratives have become normalized within contemporary culture, as Peter Diamandis, one of the co-founders of Singularity University, argues, is that *now* is the time to make our technological ambitions and visions a reality. Diamandis (2012) argues that "… for the first time in history, our [technological] capabilities have begun to catch up to our ambitions." (Diamandis & Kotler, 2012, p. 9). Many interviewees of this project express similar sentiments, in that, tangibly, what were once distant future visions and technological ambitions are now becoming possible, through technological innovation, or represented in popular culture and news media.

Just as time has narrowed the gap between future visions and technological innovation, interviewees highlighted the timely cultural shifts concerning technological innovation bringing transhumanist discourses into popular culture. Interviewee #2 described themselves as a futurist and cosmist, and also gave a distinct impression of being completely disenchanted with transhumanism, described that, "[now transhumanism is] in the background. So many things that you find every day in the press and the media today, in the 80s and 90s were only discussed in very little corners of the early internet, and the people who lived in those corners used to call themselves transhumanists." This statement is illustrative of both a shift in attitudes towards technological innovation as well as the fact that what is meant by 'transhumanist' has changed over time. This temporal shift also highlights a change in the relevance or meaning of the term transhumanist, which many interviewees spoke to as examined throughout this section.

Many interviewees asserted that transhumanist values are inherent, specifically illustrated within the sentiment that 'we are all transhumanists, we just do not know it yet.' I argue that this statement is an exemplification of transhumanist visions becoming more pervasive and therefore taken for granted as the value of the term has changed over time. Interviewee #1, a writer, who is a transhumanist and futurist with expertise in bioethics and spaceflight, illustrates the pervasiveness of transhumanist visions: "I think a lot of people exist out there who are transhumanist, but would never identify themselves as such, either because they've never heard the term or because they don't need to be branded as anything like that…" Interviewee #1's describes that transhumanist values have become normalized and therefore seemingly inherent. They describe that there is no need to state one is transhumanist, because these values are beyond needing a label, therefore, Interviewee #1 suggests, everyone must be transhumanist. This suggests that transhumanist values are inherent, even if many are not aware of what these values are called.

There is a tension, however, in claiming the pervasiveness of transhumanist visions alongside the caveat that the term transhumanism is unknown. Transhumanist values are based largely within proactionary principles, which counter precautionary principles. If proactionary values were inherent there would be little need for the principles in the first place, or the need to counter precautionary values, which are clearly not aligned with transhumanist values, therefore, I argue that we cannot all be transhumanist.

However, technologically progressive future visions have become pervasive within western culture, based in part on the familiarity of the underpinnings of technological progress logic. Tirosh-Samuelson and Hurlbut (2016) argue that throughout the 20th century, the demarcation between human and machine began to blur, in that innovative technology has allowed for new visions of mastery over human fallibility. "In the second half of the 20th century, life itself came to be a locus of new forms of technological innovation. … The development of molecular biology and biotechnology opened the way to new forms of mastery and control over life and, with it, imaginations of the power to direct evolution to desirable ends." (Tirosh-Samuelson & Hurlbut, 2016, p. 1). Tirosh-Samuelson and Hurlbut (2016) illustrate the ingrained and taken for granted human/machine relationship, in that ingrained within this relationship is also a dimension of control and mastery for humans over their environment. Transhumanists are often critiqued for 'playing god' or wanting to become gods using technology. As Diamandis (2012) argued, as well as Tirosh-Samuelson and Hurlbut (2016), through technological innovation, humans continue to develop new forms of mastery and control over our environment, bodies, and minds.

However, there is also an obvious tipping point, one in which technology crosses the boundary of human control. An example of this type of technology would be super-intelligent AI. Superintelligent AI would be considered that which greatly exceeds the general level of human

intelligence. According to technological philosopher and transhumanism, Nick Bostrom (2014), superintelligence is, “any intellect that greatly exceeds the cognitive performance of humans in virtually all the domains of interest.” (Bostrom, 2014, p. 26). This tipping point may be where the distinction between pervasive acceptance or at least cultural awareness of these technological future visions is distinguished definitively from far future visions or where the space remains to be uniquely transhumanist. Interviewee #9, a technologist, philosopher and founder of a social transhumanist group, discussed that because transhumanist visions are becoming pervasive, one does not need to be a transhumanist to advocate for these futures anymore but that there is still room for a unique transhumanist worldview to push against the boundaries of normalized enhancement.

> You don't have to be a transhumanist to be an advocate of AI anymore. Now is AI going to integrate with humanity? Well, it already is culturally and at arm's length, and it's in our pockets [smartphones]. And as some people are building it into devices that get embedded in our bodies, and that's going to continue. So, there's still a lot of room for transhumanists to be unique to the extent to which we expect AI to integrate with humanity. (Interviewee #9)

Interviewee #9 explained that although things like our smartphones have become pervasive, there is still space for transhumanists to push boundaries that go beyond the normalized boundaries of technological progress logic and innovation. Even though they are aware of the proliferation of transhumanist ideas, they still see a need and space for transhumanist visions to be distinct amongst the proliferation of futurist technological narratives.

In discussing a temporal nuance between future visions, material configurations, and broad cultural acceptance new technological uses, Interviewee #12, who is a transhumanist and innovation coach specializing in technology, health and science, discussed somewhat problematically, that attitudes towards innovative technological change take place gradually, changing over time. Interviewee #12 described that as long as we culturally continue to value

technological progress, there is a certain inevitability that some of these technological visions will come to pass. Interviewee #12 stated, "I see transhumanism not as inevitable, but as long as we continue to value technical progress, humanism comes right along with it." Interviewee #12 illustrates a reliance on both technological determinism and a taken for granted belief in technological progress logic. I argue for the need for a more nuanced approach to their statement, one that takes the socio-technical relationship seriously, analysing the ways in which the social and technological shape and are shaped by one another, and therefore acts to counter technologically deterministic outlooks.

Jasanoff (2016) speaks to a paradox within transhumanist narratives in that technology is created by humans, and therefore technology itself is not absolved from the fallible flaws of humans. Even the best technological design can behave in unexpected ways. Jasanoff (2016) argues that normative visions become embedded within technologies, arguing that they are not neutral, but reflect valued normative visions, such as "visions of what life is and how it should be lived." (p. 74). Social and technical values are therefore embedded historically and culturally within the materialization or technological innovations. Therefore, Jasanoff (2016), argues that technologies incorporate a period's ethical standards, its cultural and social blindness, as well as its hopes and fear. Jasanoff (2016) challenges contemporary futurists, and I add Interviewee #12's transhumanist narrative claims, with the ability to recognize the socially embedded nature of technology, as well as a 'thick' enough understanding of technology in order to be able to account for its limits as well as its possibilities when thinking about perfectibility, enhancement, and transhumanism.

Despite my critiques, there is credibility in what Interviewee #12 stated, as some future visions will come to pass, even if most likely, not in exactly the way they were envisioned, which

is indicative of hype cycles, where disappointment is built into an expectation cycle where investment is needed (van Lente, 2012). Hype cycles will be discussed further in the following chapters. Interviewee #12 continued to discuss the proliferation of transhumanist discourses while placing emphasis on the general acceptance of gradual technological change over time.

> The person that I'm talking to, maybe a medical doctor … when I talk to them about [enhancement], they say they have no objection to shoulder replacement surgery, or to a knee replacement surgery, or to a heart transplant, but are those on the slippery slope to transhumanism? People accepted that over time. I'm at the age where I remember all the controversy … about heart transplants, and there were significant religious, philosophical, moral, ethical points of view. We went through that same thing with in vitro fertilization. (Interviewee #12)

Interviewee #12 spoke about the idea that, given enough time, what once may have seemed like a radical technological innovation, will become widely accepted. Their example, I argue, expresses a mundane integration of the proliferation of futuristic visions within cultural acceptance. The mundane materialization of grandiose visions will be explored in detail in chapter 7, where I argue that future visions are currently being expressed in mundane technological configurations. Furthermore, Interviewee #12 described that given enough time, what once may have seemed like a radical technological innovation, may become widely accepted. Although this can be considered a generalization, there is merit in recognizing that within a futurist movement, some claims made by transhumanists are simply far ahead of their time and societal attitudes as well as the technological capability itself takes, in some cases, decades to come about or become widely accepted.

Jasanoff (2015), focusing on science fiction influences, argues that some material manifestations of future visions lag decades or more behind their initial influences. “Technological innovation often follows on the heels of science fiction, lagging authorial imagination by decades or longer.” (Jasanoff, 2015, p. 1). For example, Jasanoff (2015) refers to Hal 9000, the fictional

artificial intelligence character in the sci-fi film *2001: A Space Odyssey*, directed by Stanley Kubrick (1968), as an influence of IBM's Deep Blue, a chess playing expert supercomputer. Jasanoff (2015) argues, "Arthur C. Clarke (1968) created the scheming, lip-reading computer Hal thirty years before IBM programmers developed Deep Blue to beat chess master Gary Kasparov at his own game." (p. 1). Jasanoff's example illustrates Interviewee #12's statement, that there is a particular temporal dimension between future technological visions and their material configurations. Interviewee #12 exemplified this gradual process of cultural acceptance to technological change and innovation over time.

Another aspect of the pervasive nature of transhumanist visions, is in part due to public figures, however controversial, who promote these visions or similar future technological visions, such as Elon Musk, Peter Theil and Jeffrey Epstein. Several interviewee's had strong opinions on Elon Musk's involvement with transhumanist type goals and visions. While many interviewees described Elon Musk as controversial and described that he does not identify as transhumanist, they described that it is difficult to argue with the fact that Musk has popularized transhumanist visions.

Bohan (2018) argues that even those who don't identify as transhumanists can and do work towards transhumanist goals as well as popularizing these future visions.

> If you make your living, or spend significant time, promoting, researching, or investing in projects that are designed to make humans dramatically more than human (such as reversing the ageing process, or reverse engineering the human brain and integrating it with artificial intelligence) then, like Elon Musk, you are a person of interest here.
>
> Musk's aim of sending humans to Mars and developing a human machine-brain interface (MBI) to connect our minds to the cloud, are profoundly transhumanist projects, and they are being pursued with the help of NBIC technologies. Creating a human MBI is a transhumanist project because it furthers the philosophical goals of card-carrying transhumanists and aligns precisely with the transhumanist objectives of expanding human potential and intelligence and blurring the lines between humans and machines to create new opportunities and

> experiences for sentient life. ... These are goals that Musk, and many other influential modern thinkers and entrepreneurs, are playing a major role in popularising, validating and pursuing. (Bohan, 2018, p. 18)

Bohan (2018) argues clearly how non-transhumanist actors, such as Elon Musk can and do work towards transhumanist goals. As Interviewee #1 discussed above, one does not have to be transhumanist anymore to advocate for progressive technological future goals, which are ultimately indicative of transhumanist endeavors, as Bohan (2018) argues. There are, however, actors such as Musk who have a tremendous amount of influence in making their future visions successful, based on their social and financial influence. Hilgartner (2015) reminds us that as niche visions become integrated into broader visions involving more actors, those visions will inevitably change, such as transhumanist visions becoming taken up by influential public figures. Hilgartner (2015) argues that "as the visions of the few are integrated into the imaginations of the many, they will be subtly adjusted or radically changed through ongoing processes involving many actors." (p. 35). Interviewee #22, a tech innovator takes the evolution of a project in stride, for example, when I asked if Interviewee #22's original version of the vision ever comes to life, or if there is often a shift in design, they replied: "Oh, it never happens, darling, … and I find it is part of the fun and part of the exploration." (Interviewee #22).

Interviewees described the need to be careful with who and how transhumanism is associated. Interviewee #19 spoke to the interesting aspect of popularity surrounding Musk. They described that only a few years ago, Musk was seen as a highly influential and inspirational figure. Interviewee #19, a non-transhumanist actor, who is a writer, researcher and expert advisor in innovation projects, stated: "Looking at people like Elon Musk is kind of interesting because if you can rewind the clock back, even just 2 or 3 years and he was seen as this extremely aspirational, interesting figure by a lot more people than today." Interviewee #19 further describes controversial

issues that have led to Musk's declining popularity, "post twitter, his post trump kind of associations, the sort of things he's been saying about transgender people and so on and so forth. So, you know, I think that there's something there about people who associate themselves with the idea of technological progress and are seen as superheroes and celebrities." (Interviewee #19). While celebrity and popular figures help promote transhumanist futures, many of these figures are or have become controversial in their opinions or approach to their goals.

Interviewee #8, an academic transhumanist specializing in the ethics of innovative technologies, further described the popularization of transhumanist visions with other controversial figures, such as Peter Theil and Jeffrey Epstein. "Now that Peter Thiel is a fascist and Jeffrey Epstein was a major funder of transhumanism and you don't want to be associated with [either]." (Interviewee #8). While this argument is not about Elon Musk or debating who is or is not a transhumanist actor, I argue here that there is a popularity and proliferation of normative and beyond normative technological progress logic that has become popularized by celebrities in western culture, which is where some of the normalization for these visions originates.

One does not, however, need to be in the position of Elon Musk to advocate for technological future visions. I argue there that this project advocates for research and dedication to ethical, equitable, sustainable, and responsible sociotechnical futures. Progressive technological future visions have become pervasive, as I have argued, in part because of celebrity promotion, as well as the reliance on taken for granted technological progress narratives and beliefs. The question therefore remains of the need for a distinctive label or term, or the need to establish oneself as specifically transhumanist, if these values have become normative. In exploring this question, I examine the value of the label transhumanist below and analyze the meaning of transhumanism in

the following chapter, where I argue that the definition of transhumanism is broad and therefore means many different things to different groups and people.

In examining discourses of inherent transhumanist core values, this section has argued that while transhumanist future visions are becoming pervasive, both on account of celebrities popularizing these visions and technological capabilities catching up with ambitions, transhumanism as a philosophical worldview remains marginalized. Although this is not an exhaustive list, in this section I have examined some of the ways in which transhumanist discourses and visions have become pervasive in Western culture.

5.3.3 Value of 'Transhumanist'

While transhumanist discourses have/are becoming more pervasive, the term itself has not gained popularity. This section therefore examines the meaning and value of 'transhumanist/ism' with the understanding that transhumanist visions are becoming realized while transhumanism as a label and term has not gained in popularity. I argue that the meaning or value of the term transhumanist has changed over time. As discussed with many interviewees, the term no longer holds the value that it used to and has become broad and therefore has a diverse set of meanings. While some transhumanist future visions have become part of a broader normative technological cultural expectation; these discourses are not exclusively transhumanist anymore and have therefore become known under many different labels. I argue that because transhumanist visions have become more pervasive, the value of the term has greatly diminished in that the need to use it has become less prevalent.

In returning to the examination of transhumanist values as innate, I explore a tension that is present between what 'transhumanism' means to those who prescribe to the label, how it performs, and how it is perceived. Interviewee #9, #1, #7, and #13 all described that while

transhumanist discourses are becoming more pervasive, the term itself has become less popular or carries less value. In this case, interviewees claimed that many, if not most people hold transhumanist values, they just don't know the term to describe them. Interviewee's therefore claim that we are all transhumanists, and just do not know it yet. While this is not a comprehensive list of reasons for the decreasing value of the term transhumanist, this section explores transhumanist opinions on the reasons for the pervasiveness and examines the reasons for the decreasing value in the term, which include, the popular cultural uptake of technologically progressive visions, the transhumanist shadow, research institutes changing names to remove 'transhumanism,' and the out of fashion ideological associations, aka 'ism' within academia.

Interviewees were reflective of the fact that while some transhumanist visions are becoming or have become broadly normalized within Western culture, 'transhumanism' as a philosophical outlook and social movement has not risen in popularity. I argue that transhumanism as a philosophy and social movement has diminished since its formalization in the 1990's. Interviewee #9, a transhumanist social activist, illustrates the ways in which they perceive transhumanism as being pervasive and beyond the need of a specific personal identifier. They discussed that what used to be unique transhumanist visions are now becoming pervasive, using the biological enhancement example of Crispr:

> I would say that many of what were the unique worldviews of transhumanism have found their way into mainstream aspiration or imagination and so they've become less salient on their own in some ways. Like, who doesn't know that Crispr is now enabling us to reprogram human bodies? I mean everybody who reads health news knows that is coming. You don't have to be a transhumanist to think that is going to happen anymore. … There's a lot of people who would never identify as transhumanists that strongly favor Crispr. (Interviewee #9)

Interviewee #9 spoke of transhumanist visions permeating news outlets with the bioengineering example of Crispr. They suggested that one does not need to specifically declare themselves

‘transhumanist’ to be excited about or advocate for these types of technological innovations. One can now achieve a simplified understanding that these types of technologies are currently in experimental phases for therapeutic use through popular news outlets, and in turn, the proliferation of transhumanist visions makes them less salient. The proliferation of technologically progressive future visions has impacted what it means to call oneself transhumanist, in that it is no longer necessary to declare oneself as technologically progressive, as these values are contemporarily becoming normative and therefore taken for granted.

Transhumanist interviewees were highly aware of the fact that their future visions are becoming more pervasive, and yet that the term is not. I argue that this signals a wider influence on technological future visions within media and culture. Since its formalization, transhumanism has influenced other social movements and technological future visions have been taken up under different names and causes, such as effective altruism or existential risk. Interviewee #7, a technological entrepreneur and a transhumanist social group leader, explained the perceived narrowness of transhumanism and therefore its potential alienation:

> One thing I've noticed about transhumanism in general is that I think that these ideas have gone mainstream. But the term itself hasn't gotten into widespread usage. … ‘Transhumanist’ is still not very well known, and it's associated more with this kind of like group of hardcore enthusiasts about certain topics but maybe isn’t a good marketing strategy for mainstream adoption. [Transhumanism] makes [people] curious sometimes, but it also can be a little off-putting or alienating for people who don't know what it is, and are thinking that it sounds strange … but yeah, there's just connotations around the word transhumanism that maybe are as alienating as they are intriguing. (Interviewee #7)

Interviewee #7 described the term as being equal parts alienating and intriguing. They highlighted a tension between the permeation of transhumanist visions into mainstream while also describing the term as relatively unknown and/or misunderstood. They highlighted a tension in that while the sentiments and visions are becoming valued in a broader cultural sense,

transhumanism itself is not. The term itself is divisive and because of the wider understanding and association with popular cultural figures, who have similar goals, but do not always share the same values or labels, there has become something of a broader understanding or alienation of this term. Additionally, Interviewee #7 described a perceived narrowness, in its association with 'hardcore tech enthusiasts,' which I find interesting, as I argue that the meaning of transhumanism is broad, in that, as described by Interviewee #5, it lacks its own value system, and therefore can support a variety of political, religious and ethical worldviews. I understand, however, that a popular culture understanding of transhumanism may be much less nuanced and therefore appear narrow.

Interviewee #12, the innovation coach, spoke further about common misconceptions and misrepresentations of the term 'transhumanism.' They described that there is a need to be deliberate with how they use and explain the term. Interviewee #12 described: "my emphasis is on the practical, because words carry baggage, and the term transhumanism sometimes [evokes] those science fiction-ish, far future ideas, and people don't see any practical aspect of that." They describe the need to be intentional and focus on specific application of the term, to not evoke common misconceptions, like interviewee #7 described.

Interviewee #1, the transhumanist and science writer, discussed that the term has become diluted or has decreased in its value over time as the visions permeate into popular culture.

> We're all still out there [referring to transhumanists]. But perhaps the term is diluted now in terms of its potency, or it's in terms of its raison d'etre, so to speak, that so many individuals, so many of the TV shows we watch, so many of the novels we read, and what we even write about in terms of day-to-day news have already integrated a lot of these futuristic concepts. You know, genetic modification of crops and other things. The cloning of animals, you know, even such bizarre ideas as mind uploading. And then radical life extension. We do see these things portrayed on a regular basis in our media, in our fiction. (Interviewee # 1)

Interviewee #1 further echoed these sentiments again throughout our interview, where they become specific about the inherent and taken for granted values surrounding technological progress, in explicitly stating that they believe transhumanism has become nearly inherent.

> Yeah, I think it's diluted as a term. It doesn't carry the currency that it used to. And yet, I do believe that many of us if not even more so than it was back in the 2000's would describe themselves as transhumanist, only because these ideas have permeated our culture and even the day to day, our daily living, to such an intense basis. (Interviewee # 1)

Interviewee #5, a renowned transhumanist, futurist and researcher who specializes in social and ethics issues surrounding human enhancement, went as far as to say that transhumanism has become so pervasive that the need for this label has completely diminished.

> So where are the transhumanists now? A lot of them are here, many of them no longer regard themselves as transhumanist, or you might be an effective altruist, but you think that it makes sense that certain radical technologies are coming, relatively soon. So, one of the tragedies of transhumanism is that it succeeded so well at becoming part of the Zeitgeist, at least in some places, that there's no real point in being a transhumanist as a form of self-identification. I know some people who really like pointing out that I'm a transhumanist, I'm a card-carrying transhumanist. But to many others, they just happen to believe that it's a smart idea to take modafinil to be sharper and that life extension is a good thing we should be putting more money into. Are they transhumanist? I think in fact, yes, but not in an identity sense. (Interviewee #5)

Interviewee #5 captured a sentiment expressed by many interviewees, although stated it more clearly, that transhumanist visions have become so integrated within culture that there is no need to state oneself as explicitly transhumanist any longer. Interviewee #5 stated that transhumanist values are taken up in different ways, with the example of effective altruism, as well as discussing the implications of self-identity as a transhumanist. They discussed that because of the pervasiveness of these values, one no longer needs to self-identify as a transhumanist to believe or advocate for transhumanist visions. They also stated that there is little to no value in the self-identity of transhumanism any longer, because the values have become part of the Zeitgeist, as

they explain. I argue, however, that because of the broadness of the term and label the contemporary meaning of transhumanism does little more than provide a self-identity.

As Interviewee #5 discussed, what may have once been extreme or radically distant future visions have become part of the Zeitgeist. If these concepts and visions that were only once spoken about in niche corners of the early internet by technological enthusiasts are/have worked their way into popular culture, the implication is that the paradigm has become normalized and there is no longer a need to debate and fight for these visions. There is much less of a need for one who believes in these values to specifically declare themselves as such, in so far as many interviewees took for granted that everyone holds transhumanist values these days, aka, asserting that 'we are all transhumanist, even if we don't know it yet.'

I am arguing however that there is a distinction between pervasive and inherent. While I see technologically progressive narratives as increasingly influential and widespread within Western culture, I take issue with the inherent implicitness with the assumption that transhumanist visions are inherent. While this may be a subtly nuanced argument to make, it is an important one. I argue that we are not all transhumanist despite the fact that a lot of people would agree with some transhumanist visions and/or values. While broadly defined, transhumanism does have a specific definition and set of values. I see the contemporary value of transhumanism being within a personal identifier, and I take issue with prescribing this label onto others. Interviewee #12 described that transhumanism has only recently become a term that humans can use to describe these inherent values, however, the argument stands, from transhumanists themselves, that the term is not being used this way. The term is broad and alienating, both issues that I analyze further in the following chapter.

One of the reasons for the decline or lack of uptake of 'transhumanist' is what Interviewee #13, a European based transhumanist author/researcher who played a pivotal role in early ICT innovation, described as the transhumanist shadow. Interviewee #13 spoke about the ongoing public relation issues that transhumanism continues to have. They described that the transhumanist public relation issues have been created by transhumanists themselves, and they call these issues the transhumanist shadow. The transhumanist shadow, according to Interviewee #13 is based on the alienation of the term, as well as broad goals within transhumanism that have become taken up by others outside of the movement. Additionally, they argued that ego-driven transhumanists and individualists that popularize these ideas offer what Interviewee #13 considered a distorted version of transhumanism.

> There's a whole bunch of other issues as to why people oppose the transhumanism message. And… in part, we transhumanists have ourselves to blame. So, I talk about a transhumanist's shadow, which is the way in which some transhumanists have allowed the movement to be portrayed. Often, it's not even official transhumanists who end up causing that impression. So, there are people in Silicon Valley who say some of the same things as transhumanists, they probably wouldn't say they are transhumanist, but they talk about, 'hey everything is going to be alright, let's build businesses which will cure a billion people's problems and it's all going to be alright.' … So many of these people might be de facto transhumanist but they're not true to what I consider the core insight of transhumanism, which I refer back to the transhumanism declaration, first formulated in 1998 by a whole bunch of people including, Nick Bostrom, and David Pierce, of which, it's eight clauses, four of them at least emphasize risks… But some of these core insights of transhumanism have been overshadowed by attitudes, which are understandably psychological, from a psychological perspective you understand why people do that. And so that is egocentric transhumanism, which I call it, which is people who are primarily interested in themselves, or the people that they love benefiting and they care less about the rest of the world. (Interviewee #13)

Interviewee #13 addressed many of the common critiques against transhumanists, which is that their values are individualistic and elitist. Interviewee #13 argued that this is a misrepresentation of transhumanism by non-transhumanist actors who become de facto associated

with transhumanism because they share similar goals/visions. This misrepresentation then becomes understood to be broadly what transhumanists represent, even though the more popular figures do not identify as such.

A further reason for transhumanism's decline, was highlighted by both Interviewee #8 and Interviewee #4 who described that any of the research institutes and major organizations surrounding transhumanist ideals have removed or explicitly separated themselves from the term in changing the names of all of the major transhumanist organizations. Interviewee #4, a European transhumanist who specialized in ethics of innovative technologies, described that what was once called the World Transhumanist Association has changed its name to Humanity+. "Now, the World Transhumanist Association decided to, because some people are scared of the term, decided to rename itself, Humanity+ …" (Interviewee #4). They briefly described the alienating or polarizing capability of the term, in that some people are 'scared' of it. I understand Interviewee #4 to be describing the public perception of the term as being off put by the label transhumanist, however, I consider here that they could also mean that those inside the association no longer want to be associated with this 'scary' term. I argue that this alienation from the term is mainly caused by the misrepresentation of transhumanism by those outside but closely associated with these ideas in the media. However, there is an additional issue, which I explore in depth in the next chapter, in that transhumanism's meaning is too broad and therefore does not have a value system of its own. Therefore, the term is able to be associated with many different worldviews as well as conflated with those who do not identify as transhumanists but have similar missions, such as Elon Musk.

Interviewee #8, the previously mentioned, US based transhumanist academic, asserted that all the major research organizations surrounding transhumanism have removed the term from their titles.

> The successful organizations don't use the term. SENS [Research Foundation], the Machine Intelligence Research Institute, all the different kinds of successful projects that have spun out of transhumanism, The Future of Humanity Institute. I would also put the existential risk projects, Future of Life Institute in Boston, the Existential Risk folks at Cambridge, they're all, you know the artificial intelligence risk people, which is an enormous domain now, they are all spin offs of the transhumanist project, but no one calls themselves transhumanist. (Interviewee #8)

There is an interesting tension in removing the term, in that while its meaning is fluid, interviewees are describing the term as being limiting, in that it is alienating or considered 'scary' by outsiders. While the term transhumanism implied progress and expansiveness of boundaries, using the term in a contemporary setting seems to imply a reductionist or oversimplification in limitation of the term.

Interviewee #8 further described the reasons that the Institute for Ethics and Emerging Technologies (IEET) explicitly decided against using the term.

> The IEET decided to go with the term techno progressive (takes out transhumanism). Partly because the term transhumanism refers explicitly to human enhancement. And we saw the philosophical and policy issues that should be addressed as much broader than human enhancement. We were interested, for instance in geoengineering and global catastrophic risks. So, there were a lot of cognate philosophical issues that were not directly related to human enhancement. (Interviewee #8)

Interviewee #8 described political and ethical implications for not taking on the transhumanist label in the IEET. They described that transhumanism is limiting in that it focuses on humans and excludes more than humans. A common critique of transhumanism is its individualized and humanist focus. The IEET has therefore not limited itself to strictly transhumanist values within its research agenda.

A final issue concerning the contemporary value of transhumanism is described by Interviewees #12, #25 and #8, who all discussed that being labeled as transhumanist has become

unfashionable, in that association, especially within academia, with an ideological position is outdated and dangerous.

> So generally, calling yourself something 'ist' is dangerous. I think one of the late 20th century views was, 'oh, ideologies are bad.' This is something that really started to hit in the 90s' with the fall of communism. People were extremely disillusioned about the ideologies, and there was already this postmodern criticism of the grand narratives, as well as the more common view that many of these ideologies seem to be claiming utopia but produce very bad effects. So, being pragmatic and not adhering to any ideology seemed to be a proper way of living as a person ... so, many people don't like that kind of labeling. (Interviewee #12)

To further this point, Interviewee #25, a non-transhumanist futurist, implicitly specified that terms are loaded and need to be used intentionally, when they asked me to 'drop the -ism,' in the beginning of our interview. They described that 'ism' is indicative of particular ideological positions, which similarly, they describe as dangerous. When I asked Interviewee #25 'how did you get into futurism?' they responded:

> Well, first of all, I'd like you to consider dropping the word, 'Ism,' and I will tell you why. If you do a Google search on 'Ism,' 'Futurism,' you'll find it's a school of art started in Milan, Italy, over a 100 years ago, and it robotized style and worship of the machine, which then became the driving intellectual direction for Italian fascism. So, we're not trying to push that. We still use the word Futurist, but we try to get rid of the 'ism' part, because 'ism' often means an ideology over which people kill each other. (Interviewee #25)

While I want to acknowledge the opinions and concerns of my Interviewees; I have done my best to use and respect the labels they use and prescribe to themselves. I have deliberately chosen to continue using the term transhuman'ism,' to describe the values and ideas of those who represent this worldview and philosophy.

Interviewee #8 echoed these sentiments while further explaining that the term has transitioned. Interviewee #8 explained that ideological associations within academia are unfashionable, while describing that beyond academia, 'ordinary folks' have not given much

notice to transhumanism. Additionally, they described that many taking up transhumanist goals today, likely call it something else that was inspired by these visions.

> But in academia, it really doesn't do you much good to be an 'ist', right, sociologists, maybe, but not if you attach yourself to an ideology in academia, it's not very useful. And will ordinary folks start, you know, saluting the flag of transhumanism, I don't think so! So, the things that are going to be coming out of what we did, are going to be different, not called transhumanism, we will have played a role for a particular historical period and some of us may continue to call ourselves transhumanist for those historical reasons. (Interviewee #8)

Interviewee #8 illustrate transhumanism in a nearly historical context, in that its use is unfashionable and provides influence for other social movements and future visions today. The term holds little meaning to Interviewee #8 outside of historical influences on today's technological future visions.

While this is not a comprehensive list of reasons for the decreasing value of the term transhumanist, in this section have illustrated the changing meaning and value of the term transhumanism using examples from transhumanists themselves. Because transhumanist future visions are becoming more pervasive, it has diminished the value and need for the term beyond a personal identifier or historical context.

5.3.4 Internalizing Change

In continuing to examine the changing value of transhumanism in a contemporary setting, I briefly examine how transhumanists have internalized the changing value of this term that they hold or once held as an important piece of personal identity.

I spoke to Interviewee #14, a U.S. Transhumanist Party representative about the public reception of transhumanist visions in the context of a United States political party. They spoke of the general lack of awareness of transhumanism within the broader public as well as a lack of

reflection on the part of transhumanists to seek outside of their own filter bubbles. I ask Interviewee #14, 'What is the reaction to something like the transhumanist party?" and they replied:

> The majority of reactions are simple unawareness. And that is a lot more prevalent within the general public, the ordinary person on the street, so to speak, as contrasted with people in media, academia, or even politics, who have had more exposure to transhumanism, but I think sometimes a lot of transhumanists as do we all fall to this filter bubble effect, where they think that a lot more people have the same context that they do.
>
> And the reason why there isn't an immense public transhumanist movement is because the public finds some aspects of transhumanism off putting. I actually don't think that's the case. I think, if one explains transhumanism correctly to the general public, the reception is about 50% mildly in favor and 50% with some reservations. Of course, there are going to be extremists, as the most hostile people to transhumanists are political partisans of both the left and the right, generally, extreme left, extreme right. … On the other hand, there are people who, … have a lot of bias against transhumanism for whatever reason, they may just think that essentially, this is speculative in some way. But of course, my response would be, all technologies were speculative until they were developed, and you need some sort of impetus to develop them in the first place. (Interviewee #14)

As examined previously, Interviewee #14 described either a lack of awareness of transhumanism or they have encountered misrepresentations and therefore find it off putting. Interestingly they described those who do not fit into accepting transhumanist values as extremists of those who have negative biases against them. This statement is an interesting internalization, as it comes back to supporting the transhumanist belief that we are all transhumanists, even if we don't know what it means. There is an implied inherence in these values in Interviewee #14's statement.

Beyond either a general lack of awareness outside or influence of misrepresentation, both Interviewee #14 and Interviewee #1 highlighted the difficulty of the world we live in today, and the limited philosophical and intellectual space for the general population to spend time pontificating about far future hope and expectations. Interviewee #14 continued from their statement above, in suggesting how to overcome the lack of awareness in the movement:

> So, unawareness, how to overcome it. That has been the principal challenge, I think, primarily, the challenge is, many people's lives are just really difficult right

> now. And people are engaged in day-to-day survival types of pursuits to a greater extent than they would have been even 10 to 15 years ago. And people who, for instance, have to work multiple jobs or are dealing with chronic health issues, they don't have as much time to study philosophy or follow the news about the latest emerging technologies, they don't have the time to form an integrated picture of world events and where they may be headed or think of alternatives... And the question then becomes, how do we maximize the number of avenues by which people could access this information and engage with us, even if they don't have a whole lot of time. So that's going to be our challenge for the next five years, essentially, more content creation, more public outreach, developing approaches that may not be entirely centered on politics. (Interviewee #14)

Interviewee #1, previously introduced as a science writer, described similar sentiments, explaining that the concepts that resonated 10 years ago surrounding technological innovation and futurism do not translate into the political agendas of today, describing today's public as jaded and having little interest in these futurist type concepts.

> I was definitely writing about [transhumanism], and that was exciting. For years and years, I wrote some crazy things. If you go back in the archives, you know, there's some really amazing subject matter that we touched upon back then. I find that today I think readership would be a bit more jaded, cynical, I don't even know what the [right] word might be. It'd be hard, I think, to translate some of these heady concepts that we were talking about 10 years ago to today's readership. I mean, we're now post trump. We're now post Ukraine invasion. We're now post this, post, that post, post covid, we are now post, the destruction of Roe versus Wade. So, we've got a lot bigger fish to fry than the pie in the sky, you know, idealizations of transhumanists, and you know, and radical futures in general. So, these are tougher pills to swallow, and I don't think our readers are very, you know, excited to hear about this stuff right now. So, over the course of the years, I've written less and less about that. I think that's probably why, it's not to suggest that these items are any less relevant, or any less credible. (Interviewee #1)

Interviewee #1 illustrated a hugely important example in that they have considered the changing timeline within considering the changing value of the term transhumanist. Above I criticized transhumanists for not taking historical changes into account, Interviewee #1 has demonstrated taking into account recent historical changes that have affected the reception and success or lack of enthusiasm around this futurist movement.

Interviewee #8, an influential transhumanist academic, further illustrated this point of continuous change over time, stating: “I don't think transhumanism as transhumanism will necessarily be, you know, have legs in the future. So, trying to rebrand as something that could be more palatable and understandable. Yeah, I think it is fine.” They further suggest that the human condition will continue to change over time, and that transhumanism does not necessarily capture these changes, because it does not connote post-humanness. Interviewee #8 is making an important distinction within the boundaries of the term transhumanism/ist and what it specifically connotes and therefore implicitly, what is left outside of those boundaries. They imply that transhumanism does not connote post-human futures, which illustrates an interesting tension. Taking a broad understanding of transhumanism and posthumanism, I understand Interview #8 to mean that in looking towards the future, transhumanism is too human centered and that a concept like post-human better captures more-than-human futures. In this sense, transhumanism then is seen to have boundaries that are too narrow for future conceptualization for visions that include more than human beings. However, I have argued and will continue to argue throughout this dissertation that transhumanism has a broad definition, in that the boundaries of what transhumanism means are many, and therefore the value and meaning of the term has decreased over time because it means different things to different groups and individuals.

5.3.5 Conclusion

In this section I have argued that the value and meaning of the term transhumanist has changed over time while examining how transhumanists understand and reflect on these changes. Some transhumanists consider that the social movement is dwindling or dying, because it is not gaining traction and other movements have come in to fill this space, such as effective ultraists or existential risk researchers. Others, however, consider that there is still space to be uniquely

transhumanist in future vision representations as well as personal identity. The contrast within these claims serve to highlight the multiplicity within and between transhumanist social movements and therefore the multiplicity of meanings surrounding core values as well as the marginal position that transhumanism continues to maintain.

5.4 Conclusion

This chapter has examined both historical and contemporary transhumanist discourses and argued that transhumanist future visions rely on taken for granted technological progress narratives, in both historical and contemporary cases. I argued that internal historical transhumanist narratives are deterministic and anachronistic, in that they focus solely on technological inventions and leave out social implications and do not consider sociotechnical changes over time. Furthermore, the implicit use of technological progress narratives has unfortunately led to the contemporary diminishing value and social use of the term transhumanist.

I argued that there is an important if subtle difference between pervasive technological values and inherent human values, because while transhumanist values are becoming pervasive, there is, therefore, less need for a specific term of technological enthusiasts, this does not equate to in inherent human longing for technological embodiment and improvement. I argued that we have not always been and are not all transhumanists, despite the claims of transhumanists who argue otherwise. I argued that transhumanism remains marginalized in that their visions and the human/technological boundaries that they aim to blur continue to be on the extreme or extremely progressive side and that these visions are not and should not be considered accepted by all. There are serious risks and ethical implications to embodies technology that cannot be taken for granted or overlooked in this discussion.

The pervasiveness of technological progress narratives offers a dichotomous paradigm where transhumanism is concerned. At once, it diminished the need for a strongly stated technological human advancement advocacy statement, but it also provided legitimacy in the sense of these visions becoming popular. Some transhumanist visions were, only decades ago, science fiction. Transhumanist future visions reaching popular culture, in another sense, sees past future visions coming true, and therefore proves that past future predictions have/are coming true and therefore serves to create legitimacy for further future transhumanist visions. Future visions are rarely value free and normally imply a positive or negative valuation of the future (Konrad et al., 2016). Transhumanism offers, if overly optimistic, positive valuations for futures. Transhumanist discourses have now translated across the boundaries of what used to be purely science fiction, which creates a particular vision of futures, aka, positive ones. Investing in transhumanist narratives offer a positive sense of control over the future.

Chapter 6: Decisions and Fragmentation

6.1 Introduction

The previous chapter examined the strategic use of historical narratives through proto-transhumanism and the implication of technological progress narratives in order to discuss the normative nature of transhumanist visions. While transhumanist visions are becoming more popular, the term 'transhuman' remains marginal. This chapter examines, in part, why this is the case, where I argue that the term's definition is too broad. Having examined the rhetoric and metaphors of transhumanist discourses in the previous chapters, this chapter examines the discursive practices surrounding how these discourses construct meaning and inform decision making about the future.

In order to address this research question this chapter relies of the sociology of expectations dimensions of performativity (Borup et al., 2006; Konrad et al., 2016; Michael, 2000; Tutton, 2017; Van Lente, 1993), interpretive flexibility (Berkhout, 2006; Borup et al., 2006; Pinch & Bijker, 1984), and reflexive expectations (Birch, 2023) as discussed in depth in chapter 2. The chapter will focus specifically on the discursive practices surrounding how transhumanist future visions impact present decisions, or, in other words, how these particular future visions constitute performative practices.

Drawing on the performativity of expectations literature discussed in chapter 2, which frames the understanding of how future expectations impact present day decisions making, this chapter explicitly understands expectations to be a constitutive force (Borup et al., 2006; Michael, 2000; Tutton, 2017). Expectations are performative in that they enact futures and enroll resources. Future visions *do* something, beyond being descriptive possibilities about the future, such as enroll actors and resources, organize social groups, or create obligations. This understanding of

expectations leads to an examination of the relationship between rhetoric and future expectations. Performativity is a fundamental conceptual frame for understanding future expectations, and in analysing how decisions for the future are made in the present.

In this chapter, I therefore examine the dimensions of performativity within transhumanism, such as transhumanist visions as interpretively flexible (Pinch and Bijker, 1984). Informed by the sociology of expectations lens of interpretive flexibility (Berkhout, 2006; Borup et al, 2006; Brown and Michael 2003), I use this concept as a tool to examine social future visions or rhetoric about the future as opposed to the technological objects that are usually examined through interpretive flexibility. I use this concept to argue that because transhumanism has broadly defined features and even the foundational objectives of transhumanism are not always agreed upon, transhumanism has the flexibility to enrol a range of actors, resources, and investments. However, this flexibility is contingent on time and distance of future visions. The temporal aspect of far future transhumanist visions further marginalizes them. Finally, I build on the concept of performative and collective expectations by examining transhumanist visions through Tutton's (2017) 'wicked futures' concept. Here I add the concepts of fragmented expectations or fragmentation to describe the divided and often competing groups of transhumanist interests.

6.2 Transhumanist Future Visions as Shared

As I examined in chapter 2, the sociology of expectations framework understands expectations as both performative and collective. According to Konrad et al. (2016), "the main performative roles of expectations in mobilizing, guiding, and coordinating diverse sets of actors involved in technoscientific fields require expectations which are to some degree common, shared reference points." (p. 466). I, therefore, begin this chapter by examining the shared 'scripts' of framed reference points between transhumanist actors or social groups. 'Scripts' or 'frames,'

Berkhout (2006) argues represent a communicable set of particular ideas about the future, which are a feature of collective expectations.

One such common or shared reference point exists between transhumanist groups, in that a common definition is used. A shared reference point also exists between transhumanist narratives and broader cultural narratives, as discussed previously, transhumanists are seeing their visions becoming more pervasive, even if not recognized specifically as such.

The nuance within shared visions between transhumanist social groups can be understood through Hilgartner's (2015) concept of sociotechnical vanguards, which refers to "relatively small collectives that formulate and act intentionally to realize particular sociotechnical visions..." (p. 34). Hilgartner (2015) argues for the nuance in understanding that some aspects of future visions overlap between groups means that they also compete with one another. Hilgartner (2015) also argues that vanguards cannot be considered unitary but need to be understood as having discrete values from one another.

> Vanguards actively position themselves as members of an avant-garde, riding and also driving a wave of change but competing with one another at the same time. Because the boundaries of collective phenomena (e.g., social movements or technoscientific fields) are ambiguous, flexible, contested and redefined in action (Gieryn, 1999) in the world of emerging technology, one finds multiple vanguards that overlap incompletely, promoting sociotechnical visions that are often only partially shared. (Hilgartner, 2015, p. 34)

As illustrative of Hilgartner's (2015) sociotechnical vanguards, transhumanist future goals and visions are diverse, in part, because this philosophical worldview can support differing and alternative personal and political motivations. However, the shared visions that aid in coordinating common goals between transhumanist groups are framed by the three pillars of transhumanism, or the three 'supers' according to Interviewee #4, a British transhumanist philosopher who specializes in human and animal ethics: "If we define a pretty basic question, what is transhumanism? I like

to define it in terms of three supers: super intelligent, super longevity, and super happiness" (Interviewee #4). These pillars correspond with some of the fundamental aspects of humanity that transhumanists seek to augment with technology, our bodies, our thoughts, and our behaviors. Although transhumanist agendas represent a diverse set of future visions, the three 'supers' serve as a shared frame between many transhumanist groups, in that they incorporate core values.

Interviewee #15, the director of a non-profit research institute focused on consciousness, as well as Interviewee #3, a futurist, singularitarian and immortalist, both spoke of the importance of the three pillars in terms of framing goals as well as how they have evolved over time.

> Traditionally [the three pillars are], first of all, it was super intelligence that was the goal of transhumanism. After superintelligence, then in the last 20 years, thanks to Aubrey de Gray, more and more people began talking about super longevity, and even immortality, … so that became the second, and then there is a super happiness, super well-being [guided] by David Pearce, who is a philosopher, one of the co-founders of Humanity+. (Interviewee #3)

The above statements are shared anticipatory statements regarding representations of technology and humans. Immortality is a contested term within transhumanism, most opt to use 'longevity' to signify the project of human life extension. The three pillars serve to create a shared frame or goal between three distinct areas of focus.

Another shared frame that creates future visions between transhumanist groups is the commonly used definition of transhumanism. Both Interviewee #7 and #10 provided a consistent definition, showing a shared understanding of the meaning of transhumanism. Interviewee #7, a technological entrepreneur as well as a leader of a transhumanist social group, offered the following definition: "I think of transhumanism as the ethical use of science and technology to improve the human condition. And obviously we would need to unpack what we mean by ethical and what we even mean by humans." (Interviewee #7). While giving a broad definition, they

specified the need to think carefully about the context and meaning of terms used within this definition.

Interviewee #10 a prominent transhumanist figure focusing on longevity gave a similar definition to which they added an extensive clarification on what they felt was included within transhumanism and what was not. “So, what [does] transhumanism mean to me? To me, the core idea is really that it is both possible and desirable to use technology to overcome fundamental limits to the human condition.” (Interviewee #10). Interviewee #7 and Interviewee #10 provided remarkably similar definitions, offering a clear and consistent definition of the term, if broadly defined.

Some clarification given by Interviewee #10 on what is explicitly not part of the core of transhumanism was the goal of eliminating suffering which they thought of as related but not a core transhumanist ideal. Meanwhile, others consider that the elimination of suffering falls under the purview of super-happiness, and, according to Interviewee #4 and #15, as an extremely important moral obligation to work towards for humans and non-humans alike. This example illustrates the diversity of meaning within and between transhumanist groups and thinkers.

Berkhout (2006) argues that the boundaries between private and shared visions can blur, and that they are often difficult to define. Although the definition and core fundamentals of transhumanism have shared common frames in their goals and visions, there are differences in understanding based on personal and political goals and preferences. Berkhout (2006) argues that “what seems important is that, as with private visions, there are multiple sources of collective visions that confirm, contradict and influence each other.” (p. 307). Michael (2000) argues that there are always multiple and contested visions for the future. Not all future visions come to pass, and they often compete with one another.

The complexity and nuance of contradictory visions is captured by Interviewee #8 who expressed a complex dynamic between individual expectations and a collective impact. They described anxieties about techno-progressive perspectives, wherein individuals seek to benefit from particular technologies, but have concerns regarding broad use and alternatively, those who have no access to these technologies.

> There's a lot of anxiety about these things [transhumanist future visions; mind uploading, cloning, etc.], legitimate anxiety … there's the anxiety about who's going to benefit. So, when you ask people, 'Do you think it'd be good for society?' A lot of people say, 'No I don't think that'd be good for society to have that.' Then you say, 'well why? Would *you* want it?' and they say, 'Yeah, I would want it, but I think it might not be good for society because I think only the rich are going to get it.' (Interviewee #8)

Interviewee #8 illustrated a contradictory and nuanced vision between the collective and individual level. While personal benefit from the types of visions transhumanists have about the future are desirable, there is a broader anxiety about equity and responsible use. In this example, Interviewee #8 illustrated how visions and rhetoric influence one another. Berkhout (2006) argues that "metaphors and rhetorics from one set of discourses will come to be used in the framing and disputation of others." (p. 307). In this sense, Interviewee #8 has captured sentiments from both utopian visions and dystopian or risk narratives. Berkhout (2006) argues that future visions become grounded in social and institutional frames, in that future visions are created by actors also grounded within these same frames. According to Berkhout (2006), future visions provide a "means for reconciling experience with knowledge," (p. 301). Or in other words, future visions allow for a balance of theoretically thinking about the future while maintaining many of the practical boundaries of technological application of today, or near futures. It is within this understanding of future images that the role of expectations frame how futures are shaped and made sense of in the present.

6.3 Transhumanist Future Visions as Flexible

Building on the understanding of collective expectations, this section uses sociology of expectations literature (Berkhout, 2006; Borup et al., 2006) to analyses the interpretive flexibility (Pinch & Bijker, 1984) of transhumanism.

Because the definition and core ideals of transhumanism are broadly defined, future visions associated with transhumanism are taken up in a multiplicity of ways, through different means and with a variety of end goals. However, transhumanists do have a shared frame through the use of a shared definition, if broadly used. This section will examine the implications of this definition, in that it is vague and therefore left open and compatible with many other worldviews and political ideals. This leaves transhumanism and transhumanist goals open to what I call fragmentation.

Expectations can be generally understood to broker relationships between different actors and social groups. Because there are different social groups working towards a variety of goals, all identifying as transhumanists, despite existing political differences, these groups create some awareness for transhumanism in multiple sectors, such as technology, medicine and health care, science and even politics, which creates social endorsement for one another.

Expectations need endorsement from other social actors or groups, as Berkhout (2006) describes, expectations must be flexible and open to interpretation. Borup et al. (2006) discuss the difficulty in imagining the formation of technological innovation without "some kind of shared, though flexibly interpreted, cluster of guiding visions." (p. 289). Therefore, according to Bijker (1995), shared vision needs a degree of interpretative flexibility.

The degree of flexibility is what is important to distinguish here, as it can cohere or fragment a vision. As Berkhout (2006) argues, the degree of flexibility of a vision is important, a vision that fits easily into many different circumstances can influence how widely and robustly the

vision is taken up and organised around. “A degree of flexibility over the interpretation of a vision can widen its relevance to a greater numbers of actors.” (Berkhout, 2006, p. 305). Alternatively, too much flexibility can cause interpretive instability whereby its capacity to coordinate resources and social actors is diminished (Berkhout, 2006).

Many transhumanists are aware of the implications of this broad definition. For example, Interviewee #4 highlighted the diverse use and meaning of transhumanism; “There are almost as many, I would say more, conceptions of transhumanism than there are transhumanists. I hope that in spite of all this tremendous diversity there is enough in common to make the term not completely meaningless.” (Interviewee #4). Interviewee #4 expressed their concern over the lack of common or shared values within transhumanist visions. When the definition is too broad and therefore too flexible or too open to different interpretations, it runs the risk of becoming nearly meaningless, as Interviewee #4 described. As discussed by Interviewee #7, while the narratives of transhumanism are becoming more popular, the term transhumanism is not. I argue that this is in part because the term itself is too flexible.

When looking at the coherence of transhumanist visions, it is clear that there are shared values throughout visions between transhumanists, however both the normalization of transhumanist discourses along with the broad goals of transhumanism have caused interpretive instability (Berkhout, 2006). Although there is some overlap in values associated with transhumanism, the ways in which working towards these future goals is taken up is diverse.

Interviewee #5 illustrated interpretive instability when they discussed the lack of value theory within the philosophy.

> I think there is a fundamental, well I wouldn’t exactly call it a flaw, but there is a fundamental property of transhumanism, and that is it lacks a value theory of its own. Why should we become transhuman? If you ask Max More in the self-transformation essay, it's kind of a virtue ethical idea. It's a good thing, it's an

> excellent life to transform yourself and become a better version of who you are. But if you go to the Christian Transhumanist Association, they will say, 'Well, God wants you to become better.' You can find the various answers, and you can almost plug in any value system whatsoever here. Now that can cause a lot of disagreements, … but I do think there's a lack of general value theory. It is a bit of a disadvantage because you can combine transhumanism with almost any other political view, except maybe conservative, [but] I've even seen a theoretical argument for the conservative transhumanism, which is hilarious. (Interviewee #5)

Interviewee #5 discussed that transhumanism lacks a value theory, which means that it can support a multiplicity of political, religious, attitudinal, ideological and philosophical worldviews. Taillandier (2021) argues that "most transhumanists have understood their project as either fundamentally anti political or theoretically compatible with a wide variety of political stances." (p. 217). Because transhumanism can be interpreted within these different worldviews, it ends up taking up different meanings to different people. Interviewee #5 described a few examples, in one sense it is a virtue ethical idea, while in the other it is associated with religious ideals. In that the term has such a wide range of meaning, it is difficult to give the term a definitive meaning, however it becomes clearer in terms of why the term and movement has not become popular in and of itself. The term is so flexible that transhumanists themselves cannot agree on its meaning, which therefore makes both popularizing the term and consensus amongst transhumanists very difficult.

6.4 Transhumanist Future Visions as Fragmented

6.4.1 Introduction

This section builds on the concept of collective expectations and interpretive flexibility by examining transhumanist visions through Tutton's (2017) 'wicked futures' concept. This section examines the implications of both the broad definition of transhumanism, as well as the nature of transhumanist future visions being interpretable and flexible, as discussed above. Because transhumanist future visions are flexible, along with the impacts of transhumanism being broadly

defined, I argue that transhumanism is fragmented by different goals, values, and future visions. This fragmentation ultimately affects the overall impact of the social movement, the meaning the self-identification holds and the relationships between transhumanist social groups.

In this section I add the concepts of fragmented expectations or fragmentation to describe the divided and often competing groups of transhumanist goals and values, which often include fundamental political differences. I use fragmentation to describe the fractures and social distance created between transhumanist social groups caused mainly by differences in political, ethical, or religious worldviews. I argue that the implications of these differences have created epistemic fragmentations, in other words, a phenomenon that is created when people or groups are isolated from one another, and therefore sharing knowledge, identifying problems and solving issues becomes very difficult.

I illustrate fragmentation through features of wicked futures (Tutton, 2017) which are present transhumanist visions. The scale of transhumanist visions along with politics, resource allocation, distance of futures and impacts of decision making will be examined within the context of wicked futures and fragmentation. I argue that political differences have caused epistemic fragmentation amongst transhumanist groups. Therefore, the reason technological innovation narratives are becoming pervasive, but transhumanism as a term and philosophy is not, is because of the competing conceptualization of transhumanist future visions between groups. Keeping in mind Hilgartner's (2015) concept of vanguards, transhumanist groups often compete for limited resources with one another. Finally, the way in which transhumanists are impacted by future visions will be examined through Birch's (2023) reflexive expectations.

6.4.2 Transhumanist Visions as Wicked

Tutton (2017) considers temporal aspects of expectations in examining that contemporary futurity looks much different today than it did in the 1960s. In the 1960's, Tutton (2017) argues, futures were based in a set of progressive values, whereas today, we live in a time of wicked futures. According to Tutton (2017) progressive future visions in the 1960s valued "the extension of liberal democracy and social welfare, and the power of technoscience to meet human needs and wants." (pg. 478). However, Tutton (2017), citing Berardi (2011), argues that what once typified cultural excitement surrounding progressive future narratives in the twentieth century, is now reflected on as the 'myth of the progressive future,' in that many of those narrative did not come to fruition, and those futures no longer exist. Interviewee #8 speaks to Tutton's argument, however, while not describing a change from optimism to pessimism, describes the turn of techno progressive or optimist as a political turn from left to right.

> I began to realize that I was more in a tradition of enlightenment techno optimism that had been largely associated with the Left until World War II. And then after World War II, the bomb and environmentalism and the counterculture and post modernism and all kinds of things, contributed to this shift where, if you were a fervent believer in techno optimism, you're probably on the right and most people on the left were technic critics. (Interviewee #8)

The context of this statement is given while describing political disagreement between Extropian political views, which Interviewee #8 described as 'anarchist capitalist' and their own political views, which they describe as techno progressive. This description of greatly differing political views within transhumanist thought begins to indicate some of the fragmentations this section examines, while also highlighting shifts in technological ideologies over time.

As discussed in chapter 2, the defining features of a wicked problem include large scale societal problems that do not get solved because they are often intertwined with other large scale

societal issues. Additionally, there are temporal, political, and financial constraints that effect the solvability of wicked problems.

Transhumanism can be framed within these characteristics of wicked futures because Transhumanist goals display characteristics of being symptoms of other problems; take longevity for example, working towards human longevity involves solving a myriad of associated health care problems, both medically and socially. The goal of human longevity relies in the belief of the technological progress narrative, that technological intervention will solve human problems.

Rather than analyzing future expectations through a progressive futures lens, Tutton (2017) argues that we now live in a time he calls 'wicked futures.' Tutton (2017) defines wicked futures as per Horst Rittel's 'wicked problems,' via Churchman (1967):

> In adopting this language of wickedness, I allude to Horst Rittel, who coined the expression 'wicked problem' to refer to that 'class of social system problems which are ill formulated, where the information is confusing, where there are many clients and decisions makers with conflicting values, and where the ramifications in the whole system are thoroughly confusing' (Churchman, 1967: 141). (Tutton, 2017, p. 479)

In applying the framework of wicked problems to the types of issues transhumanists aim to solve, it is evident that transhumanist futures display many qualities of wicked futures. When applying Rittel's definition, transhumanist goals are fitting, in that they often address large, hard to define problems with competing information and opinions. Ramifications and ethics associated with transhumanist visions, often discussed as risks, which consider known and potential unknown consequences of innovative and/or futuristic technology, are a large component of concern and discussion to many transhumanists.

A specific example of a wicked problem within transhumanist narratives may be longevity, wherein some transhumanists are attempting to solve health related issues associated with aging. This is an ill-defined problem however, in that there is no clear end goal or way to know when

longevity has been achieved or solved. As an example, Interviewee #16, who is a science communicator spoke to the difficulty of even defining longevity science, or what they call anti-aging science in a way that can be clearly communicated to both the public but also healthcare and scientific fields.

> This is an absolute minefield. [One] problem with anti-aging is that a lot of people have a lot of definitions for aging and my definition of aging, biologically, might be, how fast your risk of death doubles, depending on what species you are. But what do people think of? They think of the wrinkles, the grey hair, that's how we visualize aging. If you're a doctor, you might think about the increasing risk of disease, but maybe not. But a lot of people also think of the social aspects of aging and the accumulation of wisdom, and the seniority of wisdom, and those aren't bad things. It's good to accumulate wisdom and become more senior and all this other stuff. So, it's very hard to disentangle all of that stuff and come up with something that pithily encapsulates the fact that you are just trying to maximize human health and happiness, and even that has its own problems because utilitarianism has a sort of checkered history. (Interviewee #16)

Transhumanist visions of longevity are wicked problems, in that, as described by Interviewee #16, even defining the problem of curing aging is extremely difficult to articulate. Interviewee #16s discussion regarding anti-aging science will be examined more thoroughly in the following chapter where I argue that the repurposing of existing medical technologies for the purposes of longevity are mundane material configurations of grandiose transhumanist future visions.

Many of the issues that transhuman future visions aim to solve inhabit wicked problem features, which are characteristics which lead transhumanism to fragmentation. A wicked futures framing is illustrative of why transhumanism is fragmented, in that overall goals are ill defined, various, and for the most part, unsolvable.

Many of the issues transhumanists seek to face are larger problems than first conceptualized. Take for example the goal of superintelligence that is related to artificial intelligence. The term ‘artificial intelligence’ was coined by a working group known as the Dartmouth Summer Research Project on Artificial Intelligence, which operated in the summer of

1956 (Vella, 2017). Organized by John McCarthy, fellow participants included Marvin Minsky, Nathaniel Rochester, and Claude E. Shannon (Diamandis & Kotler, 2012). The project was designed to brainstorm and develop ideas surrounding thinking machines and 'artificial intelligence' was chosen for the name of this new field of study. The group wanted to illustrate that: "every aspect of learning or any other feature of intelligence can in principle be so precisely described that a machine can be made to simulate it." (Vella, 2017, p. 5). They felt that with a group of specialized scientists, they could make significant advancements on these problems over a summer (Vella, 2017). However, the issues related to translating human ethics into computer code are still being grappled with today.

A further example of transhumanist visions as wicked problems, in that these problems have become much more difficult to solve than initially realized, is examined within the scope of artificial intelligence, as discussed by Interviewee #5. Interviewee #5 explained that Eliezer Yudkowsky, an AI ethics researcher best known for popularizing ideas related to 'friendly AI,' is 'gloomy' these days because AI alignment has become understood as a much larger problem than first conceptualized. Artificial intelligence value alignment means that AI systems are encoded with diverse sets of human and societal values under the premise that this makes them safe and reliable or 'friendly.'

> One of my favorite memories is, I remember when Eliezer Yudkowsky, then 16 years old, came charging into the Extropian mailing list being like, 'I've had it with this work, we need a Singularity now, who's with me?!' That was hilarious, a bit cute and not very realistic, but over a few years he debated and debated and argued his case, and then started working on the question; what does it take to make a machine that is self-improving and can become superintelligent?
>
> Again, mostly theory, but then something interesting happened he realized that, 'Oh, if this actually could happen I might end up with the God of my father's, I might put in values that makes this machine very dangerous because it's still in some sense a machine, even though it might be super intelligent, it might be smarter than me, like smarter than humanity, but the values we start putting into [it] are going to get amplified beyond recognition. And that might mean that if we

> make a mistake, we might end up with something absolutely horrifically dangerous.'
>
> So, he started working on what he then called friendly AI, and then gradually this term has changed names as the discovery has deepened more and more, because it turned out to be a really interesting, and *a very hard problem* [emphasis added]. So, the more easily you think you can treat your Singularity, the more scared you should be, because it doesn't seem to be that easy to make value-aligned AI. Indeed, Eliezer is kind of gloomy these days, because he thinks we are getting too close to actual artificial intelligence, and that he and his friends are not succeeding in making them value aligned.
>
> I [have] heard this repeated by some of the people desperately working on AI alignment, but I'm a bit more sanguine on this but it's worth noticing that this movement, *they soon realized that we're dealing with super hard questions here, maybe even beyond human comprehension* [emphasis added]. We kind of would need super AI to understand it. Unfortunately, we can't build one before we solve the safety [issues]. (Interviewee #5)

While Interviewee #5 has given a rich accounting with many details that could be unpacked, here I focus on the account of one of the very large and classic existential issues within transhumanist debates, which is how to make sure superintelligent machines do not become an existential threat to humans. Interviewee #5 refers to Yudkowski in describing that this has become a much harder problem to solve than initially thought, and an important one, as superintelligent AI without value alignment could be very dangerous for human beings. Because this is a large and difficult problem with many different opinions and yet no clear solution, it is indicative of a wicked problem. Because value-aligned AI has become a larger issue than initially conceived, it means that many transhumanists' future visions have now become further away in attainability, because the risks of AI are greater. Without AI alignment with human values, and in the time it takes to work towards human/AI alignment, it is not safe to engage in other super-intelligence AI projects. Therefore, super-intelligent future visions become further future and become more difficult to garner either social or financial investment for. Because many transhumanist visions are far future, they are difficult to gain investment for. I argue therefore that the scale of wicked problems that transhumanists aim to solve has fragmented their movement.

By fragmentation I mean that issues such as scale of problems, political differences, distance to visions, and ethical worldviews have created such differences between transhumanist social groups, that the concept of transhumanism has come to have too broad of a meaning, and therefore the term then actually diminishes in its value. For example, Interviewee #8 illustrates the fragmentation amongst transhumanists by describing the multiple and often disparate aims of different transhumanist social groups.

> [Transhumanists, we are] part of the problem of the transhumanist movement per se, is that it comprises so many different components. You've got a bunch of us, the people who want to live a long time. You had Americans who were adopting crazy diets and electrocuting themselves and that goes back to Newton who was drinking mercury to try to live forever. You know, alchemists who were trying to live forever. So, this idea of using technology to live forever, right? So, you libertarians that tend to be the artificial intelligence people, white boys who were into computers, they have been around for a long time. There continues to be a big punk movement, but those people aren't necessarily interested in artificial intelligence or the singularity. And they're generally affluent and, yeah, so they have their distinctive interests and, and they don't tend to be very interested in the meat, they tend to think that meat brains are never going to catch up with computers, and why even work on human enhancement, they just to invent the robot God and the robot God will give us everything. And then they spun off the effective altruists and the catastrophic risks and so there's all these different little sub-cultures, and then politically you've got the libertarians and the left wing, but you've also got the secular versus religious divide. (Interviewee #8)

Interviewee #8 highlights epistemic fragmentation, in describing the fundamental differences in political, ethical, and religious worldviews between different transhumanists. They discuss many different angles and approaches to transhumanist visions, with little overlap and competing for relatively the same social and financial resources. They discuss the political and religious divides, as well as fundamental differences in future and human values. I argue that these are the types of issues that have fragmented transhumanism. The fragmentation throughout transhumanism has led to difficulty securing resources and therefore has led to the decline of this

movement, while newer movements have arisen, inspired by transhumanism, but addressing specific social causes, such as effective altruism.

This section has examined transhumanist visions within the scope of Tutton's (2017) wicked futures. Transhumanist future visions represent large scale problems that concern not only technical and scientific innovation but social and ethical considerations as well. Many of these issues have turned out to be more complicated and harder to solve than initially thought, which leads to difficulty in securing social and financial investment because of the long trajectory of working towards projects such as superintelligence and longevity. Differences in fundamental worldviews and values cause epistemic fragmentation amongst transhumanist social groups.

6.4.3. Wicked Features: Politics, Resources, and Time

Transhumanist visions do not exist in a vacuum, and we can consider that future visions are both a symptom and response to socio-political and socio-technical issues of our current times. Transhumanist visions look optimistically towards distant futures, and although these narratives are often criticized for being overly speculative, according to Mali (2016), these future visions challenge fundamental values and concepts of our current times and societies. For example, transhumanists' visions call for radical changes in health care, calling attention to current issues in our societies.

Wicked problems do not get solved, only re-solved (Tutton, 2017). Some of the issues to solving these types of problems consist of resources, time, or political differences. These categories are not discreet or exhaustive. As indicative of Hilgartner's (2015) sociotechnical vanguards, transhumanist social groups have had issues gaining resources in that groups sometimes overlap and compete for resources, this also ties into political differences and affiliations. Interviewee #8 describes the political landscape of transhumanism in the early 2000's. They describe the deep

political schisms that led to some people leaving the World Transhumanist Association (WTA) and the emergence of the Institute for Ethics and Emerging Technologies (IEET).

> I gave a paper … that was about the politics of the transhumanism movement. I said that the Extropians are the kind of anarcho-capitalist right wing of this thing, but really if you look at Bostrom, and what's happening in Europe, these are the more liberal democratic, politically open minded, folks. And I also talked about the fascist fringe of all of that. There were neo-Nazis and far right people involved at the time, still are. And that paper convinced them that I had a pretty good grasp of what's going on … But, and I think that this is an important through line, *the politics of transhumanism are inchoate and, you know, in terms of what holds us together, it is extremely thin. The only commitment was you were optimistic about the future of technology and how quickly things were going to change, and you wanted to have individual rights to use these technologies. We all agreed about that* [emphasis added]. But when you got beyond that, too, well, 'do you think that there should be a Food and Drug Administration to make sure that they're safe?' 'Do you think there should be a national health insurance system to make sure everybody has it?' 'Do you think that there's a problem that some people might become super empowered by these things and other people not?' All of those things, *we disagreed about passionately* [emphasis added]. And when you looked around the world in Russia you had three different factions of transhumanism, pro Putin, anti-Putin, anarchist. In Italy both of the transhumanist organizations considered the other one fascist. So we had a lot of problems in terms of politics. [The World Transhumanist Association] was basically libertarians versus left wingers. [Some things] we shared and [some things] we can work together on, and these are the things we don't agree about. But that wasn't enough. (Interviewee #8)

Interviewee #8 describes not only the political disagreement amongst transhumanist groups and individuals within those groups, because transhumanism supports different political and ideological positions, there is a lack of consensus. Goals and visions are based on individual opinion, as opposed to objective criteria, a feature of wicked futures (Tutton, 2017). I argue that expectations don't solve these wicked problems and may actually exacerbate them. Interviewee #8 highlights the political tensions and divides within different social movements that all identify as transhumanist. These types of deeply political differences are one reason I argue that transhumanism is fragmented. There are many social groups all over the world working towards transhumanist future visions, but there is little consensus and shared values amongst them.

Therefore, I further argue that the fragmentation of groups has caused a decreased value of transhumanism, in that it holds too many different meanings and values

Interviewee #8 continued to describe that because of political differences within the WTA and beyond, the IEET was started by members who left the WTA. The IEET, however, found funding difficult to secure.

> The IEET has been relatively successful for having not attracted very much money, a lot of the money in the transhumanist think tank world was coming from Peter Thiel, at least startup money. And Peter Thiel, of course, now, very clearly as, you know, what I would call the libertarian for fascism and had never been interested in supporting us when we were very clearly not interested in libertarianism more than fascism. So, we had a hard time attracting that kind of money. (Interviewee #8)

Political differences between transhumanist groups have had an impact on financial investment. The visions that transhumanists work towards are ethically and politically motivated, or what Berkhout (2006) calls moralised. Because visions are not value neutral, funding and investment is also a political process as well, one which Interviewee #8 described as fraught and potentially dangerous in terms of association with certain funders, as discussed in the previous chapter, with the example of Musk, Thiel, and Epstein.

The issues of garnering resources, such as social and financial investment are influenced by politics, as discussed by Interviewee #8. There is also a temporal aspect involved in garnering resources for future visions. The distance of future representations is one dimension through which to analyse decisions making surrounding future expectations. Michael (2000) argues that "any representation of the future will specify, to some degree, how distant it is from the present." (p. 24). Therefore, time and distance of future visions play an important role in garnering investment. Many visions are too far away, or too far future, to garner the types of investments and resources transhumanists seek. According to Michael (2000) representations of the future specify themselves

according to distance from the present, which clearly relates to a normative understanding of time. Michael (2000) argues that the distance of future representations, be it measured in weeks, months, millennium, operate through clock time and linear spatialization.

The distance of a future representation, be it near or far, rhetorically positions it in particular ways. “The main point at issue is the way that distance is used in making a representation of the future ‘perform.’” (Michael, 2000, p. 25). The measurement of near or far, as well as, *good* or *bad*, (positive or negative valuation), positions visions in particular ways. Far away visions can reduce the urgency of action and can ensure a measure of safety from risk, while close futures can call on actors for immediate concern and action (Michael, 2000). The temporality of visions is a way in which funding for visions is garnered or not. In examining the rhetorical positioning of distance in future representations, far futures present the issue of little resources and investment. Both time, in terms of distance, and lack of resources also categorize these issues as wicked futures (Tutton, 2017).

For example, Interviewee #10 discusses the lack of social and financial investment within a long-term longevity project such as cryonics. They describe that the rhetoric of uncertainty caused by their relatively broad and distant future vision, based on the inability to provide relatively exact predictions of success in cryonics. “Cryonics is the practice of preserving life by pausing the dying process using subfreezing temperatures with the intent of restoring good health with medical technology in the future.” (*What Is Cryonics?*, 2019). Interviewee #10 described that investment in longevity endeavours such as cryonics is not the ‘get rich quick’ scheme that some think it to be, and that people get discouraged from investing because more certainty cannot be offered around a successful outcome.

> People often ask me, ‘when will you revive the first person from cryonics?’ I say, ‘I don't know.’ I can maybe give you a 100-year window that I'm reasonably confident

about but I'm not going to narrow down too much more because I'll be wrong. (Interviewee #10)

A 100-year window isn't satisfying to people, is it? (Interviewer – Dayna)

No, it's not. They want a very definitive answer. And that's one thing I point out to some people that say, 'cryonics is a fraud. It's a get rich quick scheme,' which is just hilarious and depressing to me at the same time because it's the worst possible 'get rich quick' scheme. It's so hard to get people to do it at all. You know, after 50 years so few people are doing it. But we could actually probably have a lot more people doing this, if we just lied and said, 'oh yeah we guarantee we will bring you back on July 7, 2084,' and we just sounded really confident in our predictions. I'm sure that will make people more comfortable with the idea because right now, we're saying, it may or may not work. We don't know if it's going to work, we don't know how well it's going to work. People don't want to hear that! (Interviewee #10)

Interviewee #8 describes a specific but relatively large unit of time, a 100-year window, suggests low to uncertain 'do-ability' surrounding expectations of cryonics technology. Because the science and technology surrounding longevity visions through cryonics is uncertain in its outcome, this future vision is generative in a particular way, in that the distance of this vision suggests a relaxed uptake or delayed approach to take it up. This presents a paradox, financial investment is needed in order to continue to innovate and improve cryonics technology, so that clearer and more precise social commitments can be made, however the investment in the technology is difficult to come by because the promises cannot be made with precision. Interviewee #10 describes the challenges of enrolling social and financial investment over time because of uncertainty of both a time frame and success rate. As they describe, there is little comfort in investing in technology that may not come to fruition in one's own lifetime or with a 100-year window of success. The distance of these future expectations has led to low investment in cryonics. Additionally cryonic preservation is only accessible to those who can afford it; in the US whole body cryopreservation currently costs $200,000 USD and neuro cryopreservation costs

$80,000 USD (*What Is Cryonics?*, 2019). Therefore, investment in cryonics is an expensive endeavour with little guarantee surrounding its success.

This section has illustrated through the use of wicked futures characteristics, some of the issues that impact decisions around investing and resources allocation regarding particular transhuman future visions. What stops the work on tackling these wicked problems? Groups are epistemically fragmented, often compete for resources or because of political differences, some visions become successful while others do not get funded, as Interviewee #8 discussed. As a philosophical worldview, transhumanism supports multiple political, religious and ethical viewpoints, as described in detail by Interviewee #8, this means that there is little overlap in individual opinions on appropriate future visions. This creates an inherent contradiction, future visions need fuzzy enough boundaries, such as interpretive flexibility in order to enrol support and investment, however, the flexibility leads to difficulty in getting people to agree on practical issues to address. It can be inferred by Interviewee #8's discussion on political differences within transhumanist social groups, that there is little room for consensus to be reached in what visions are worthy pursuits. This is a further component of wicked problems, in that issues are not judged objectively, but individually. In this case, they are judged in comparison to other groups' goals and values, which are politically motivated, and therefore consensus is unlikely to be reached. Furthermore, Interviewee #5 discussed the implications of large-scale problems with unknowable consequences. This is illustrative of wicked problems in that existential risk and unknown consequences are indicative of why these types of wicked problems do not get solved, but only resolved, as Tutton (2017) argues. These examples of wicked futures serve to demonstrate the fragmentation between and sometimes within transhumanist groups, in that there is little agreement in what visions should be pursued, and therefore resource allocation becomes difficult.

Furthermore, the distance of transhumanist future visions further halts investment, in that guarantee of success of distant future visions is impossible to give.

6.4.4 Transhumanist Future Visions as Reflexive

Reflexive expectations impact decision making because future visions affect decisions made by social actors about the future today, and that they may change their decisions based on other actors or expectations. The examples in this section continue to focus on the topic of cryonics to further illustrate investment, agency and dissensus.

As elaborated on in chapter 2, according to Birch (2023), reflexivity considers the influence that knowledge claims about the world have on social actor's decision making, for instance, social actors may change or make decisions in response to expectations, and in this sense then expectations should be considered reflexive. Birch (2023) argues that expectations are reflexive in that actors do not make decisions to reinforce expectations but in response to them. There is also an implied sense of agency in reflexive decision making which is illustrated in the following examples.

Interviewee #1 expressed concern or an 'icky' feeling when addressing investing in cryonics for themselves. Interviewee #1's statement is indicative of a particular kind of reflexive agency. When asked if they are interested in cryonics, Interviewee #1 states:

> No, I'm not. I know people that are signed up, and all ready and raring to go. But it's not something that at this point in my life really isn't of interest to me. It's not necessarily because I don't believe it's going to work or not work, it's just that I don't necessarily feel an urge to live beyond my, let's say. … No, let me take that back, there is, you are giving away control over, I suppose the world which you might potentially be reintroduced into. And you're also out of control of who might reanimate you. So those are the kind of like, icky things that I think about when it comes to cryonics. Whereas if you just have radical life extension, you can basically either accept or decline. You know something that's going to help you live longer. But cryonics, you're definitely taking your life, and even the kind of future you wake up into your own control, assuming that it could all work of course. (Interviewee #1)

When asked about their interest in cryonics, they definitely declined interest, stating that they feel a loss of control in that someone else will have control over decisions for you in the future. Interviewee #1 described a contestation around the longevity preservation tool of cryonic technology. They express their agency by expressing discontent in stating that they do not want to relinquish control of their future to anyone else in the future.

As reflective of Birch's (2023) reflexive expectations, Interviewee #5, a long-time transhumanist and ethics and risk researcher in the UK, expressed their personal investment in cryonic preservation. Interviewee #5 described that although this technology has been around symbolically for some time, their decision to invest may have been made in vain. They described the lack of awareness or preparedness of those around them, on a collective level, for the proper procedures to initiate cryonic procedures, if something were to affect their health suddenly and dramatically, as there is a lack of collective or social infrastructure around this vision. Additionally, Interviewee #5 recognized the social stigma or 'weirdness' of this idea to their family and friends.

> There is a matter of how much do you want to make your family think that you're a weirdo? Which is of course a classic problem. Cryonics is a pretty good case in point. It might not be the central transhumanist technique, but I think it's been symbolically ongoing for such a long time, and it raises this point that if I were to keel over dead right now, it's very unlikely but this medallion (cryonics medallion necklace) would help me … because [no one] would know what to actually do with it. I need somebody to speak for me, so I should have a cryo buddy, and ideally, of course, I should be able to talk to my doctor or my family would be supportive of this. If my family finds out but oh, [I have] a weird contract about some weird freezing thing. I'm in trouble. (Interviewee #5)

By investing in cryonics for themselves, Interviewee #5 invested in a resource which they hope will enact a particular future vision for them. They demonstrated that they seek to enact a particular future by investing in it, they also understand the lack of resources surrounding this particular construction of the future, in that they express they do not have the proper support network in place

for a sudden or unforeseen health event for in which case someone else would have to advocate for them, if they were not able to advocate cryonic procedures for themselves. They go on to discuss that their nieces and nephews thought the idea of them being frozen was 'cool' as they understood this through the popular culture reference of Hans Solo from Star Wars being frozen and revived. Despite the popular culture reference, Interviewee #5 reflected that this idea has not proliferated widely, in that no one would know what to do with their cryonics medallion and that they are afraid their family will think they are 'weird,' but also needing someone to advocate for them in the future (revival or to initiate cryogenic process upon death).

This is an example of a reflexive expectation (Birch, 2023), in that Interviewee #5 has made a decision to invest in cryonics for themselves, however their expectations have changed based on how other actors responded to this 'weird' idea. Both above examples further demonstrate little consensus over appropriate longevity endeavours.

Interviewee #7, a mid-forties transhumanist activist who works in innovative information and communication technology, discussed a reflexive act of agency when they told me about an active choice to delay investment in cryonic procedures at present, because of insider knowledge of 'superior technology' on the horizon. The distance of future visions calls actors to action in different ways. Because of the state of uncertainty around cryonics technology and successful revival, Interviewee #7 spoke of delaying their investment in this type of longevity technology. Interviewee #7, who is currently in a leadership position for a thousand plus member transhumant social group, described how this transhumanist group has discussed their interest in cryonics as well as their own personal decision to delay investment in favour of waiting for technological advancements.

> We have talked about cryonics for preservation, and at least a few of us actually have a cryonics plan for self-preservation. I, myself, and a few others don't yet

> but partly because we're kind of waiting on certain technological improvements that we're aware of. So, several of us are actually connected to start-ups that are innovating in these fields, and so we know a little bit more about the state of the art than the typical person would. And so, we're like well, it's too bad that that's not yet possible to purchase this kind of technology, because it's so superior to the current state of the art, for example, in cryonics, that we're holding out for when this better version of it becomes available. But those are some examples of how we've actually engaged in the use of this technology. (Interviewee #7)

Interviewee #7 described being compelled to delay investment until this technology has seen improvements, that they themselves describe knowledge about. Because Interviewee #7 is middle aged, we spoke about them feeling as though they had time to wait on this type of longevity investment, while other transhumanists I spoke to were in their 70's and would not have the same kind of time to wait to see these types of improvements before requiring longevity technologies themselves. Michael (2000) argues, "a future represented as far distant can be used to warrant slowness of action…" (p. 25). The time to wait for investment in cryonics is a further future vision for some as opposed to others for whom it is a much closer distance.

Furthermore, Interviewee #7 described themselves as having expertise and insider knowledge on this particular type of longevity technology, which is what has reassured them that delaying investment is a wise choice. On expertise, Borup et al. (2006) argue that a scientist may understand quite contradictory future expectations within their field, however depending on their role in a given situation, may express different information, promising particular claims to the public while being more cautious amongst scientific peers. This is to express the **"**interpretative flexibility and social patterning of expectations across communities often arise from asymmetries in access to the information on which expectations are based." (Borup et al., 2006, p. 292). Interviewee #7 expressed a deeper understanding of soon to be expected technological improvements, because of their position working within the technological sector. This knowledge allows them to adjust their expectation and investment because they have access to information

that the public currently does not. This example also illustrates how these parameters of future expectations are not discreet, in that it addresses how reflexivity, flexibility, distance of futures, and agency work rhetorically.

With the decision to delay investing in a future vision like cryonic technology, Interviewee #7 discussed the actions they take daily in the hopes of staying healthy long enough to wait for technological advances in longevity technology. In fact, many Interviewees spoke to me about their intentional actions to ensure their health in the hopes they love long enough to see some of the longevity technologies come to fruition. According to Michael (2000), narratives of the future suggest collective action, what we should or shouldn't do to reach a particular outcome. Michael (2000) argues that it is of interest how the individual responds to this narrative, in actively working towards or passively being driven towards such expectations especially when visions feel outside of an individual's control. Many Interviewees spoke of taking supplements, an action that I gather is common amongst transhumanists, an act they view as keeping themselves healthy for the future. This act portrays their active agency, in what Michael (2000) describes as "purposeful striving towards the future" (p. 27). In fact, both Interviewee #7 and Interviewee #9 spoke about their daily actions in taking supplements along with other wellness activities, with the goal of longevity as transhumanist advocacy.

> I would say that we regularly have discussions amongst ourselves, things we could do to better, how to use technology for various goals. So, we've had, for example, meetups about healthy aging, and how to utilize various supplements to kind of improve our health … We regularly take nootropics, and geroprotectors and other kinds of things that will improve health, or help your body to age a little more gracefully in a little more healthfully, right? So, we've also just talked about just practices like intermittent fasting and regular exercise, and some, you know, some more basic things, some maybe more radical things. (interviewee #7)

> I … use a lot of dietary supplements. Yes, both cognitive enhancement and for healthy aging. I practice intermittent fasting. I work out at the gym on a very

> regular basis, usually about 4 times a week. I try and usually succeed at getting 7 and a half hours of sleep every night. I practice prayer and gratitude and meditation on a regular basis. I tried to foster positive social relationships. … All of these things improve my mental wellbeing. All of these things improve my physical health, and I do them because I want to be in a position physically to contribute to building the kind of world that I aspire to live in with people that I love. (Interviewee #9)

These examples reflect the rhetorical work of near-term future expectations, which is a different scale and distance to far-term futures discussed above. Near term futures call for immediate or more urgent action. Both Interviewee's displayed agency in daily actions in the hopes of staying healthy and thereby delaying the aging process.

Reflexive expectations are important to consider within this case study as many transhumanists are well aware of the impacts of their visions in the sense of them becoming more pervasive however not under this label. Many I interviewed were very in tune with the fragmentation and political disagreements within and between movements, as illustrated within this chapter.

6.5 Conclusion

This chapter has examined how present decisions about the future are impacted by future representations by examining the performativity of future rhetorics. I framed transhumanist visions as wicked futures, as according to Tutton's (2017) uptake of wicked problems. The types of issues transhumanist visions seek to address fall into wicked futures in that there are no clear and objective solutions to these large-scale issues, this leaves transhumanist groups divided, because these visions are open to competing resources and politics.

What implications does fragmentation in transhumanism impose? I argue that the label has become more important as a personal identity label than substantial in a broader cultural sense, in that transhumanist sentiments are becoming normalized however the term is not popular. Many

transhumanists themselves may not even identify as such anymore. I argue that this is an implication of the term being too flexible. Having no value theory, transhumanism is open to a multiplicity of worldviews and therefore is taken up in a plethora of ways. The label is too open to multiple interpretations of its meaning. Transhumanists themselves cannot even agree on what falls under the purview of the label, as in the example of disagreement of what constitutes the three pillars.

Having examined the fragmentation of transhumanism, and notwithstanding major ethical concerns of some transhumanist visions, I nevertheless argue for the importance of alternative future narratives. As Mali (2016) argues, while these visions are often accused of being overly speculative, they offer a criticism and therefore alternative future vision. This type of alternative future reflects issues in our current societies that need to be addressed. In that transhumanists spend a lot of time thinking about futures, these visions also reflect issues in our present.

In that transhumanist visions offer hopeful alternative futures, this is one way in which these visions perform. Transhumanist visions offer hope and optimism that technology can solve large scale issues that human futures face, or that technology can improve the fallibility of the human condition. In this sense, transhumanism offers to ease anxieties about our futures, even if they offer a false sense of control over what the future may be. These visions, for some, offer a sense of control and inevitability about the futures that may come to pass.

I have argued that transhumanist narratives are fragmented. In this sense, I see the fragmentation of transhumanist narratives as a decelerator to their progress because of the multitude of collectives representing them. In theory, the shared and collective identity over different projects should add recognition and coordination between groups, however, this does not seem to be the case in practice, as groups compete for similar resources based on political

motivations. Therefore, transhumanism has seemingly more impact on individual identity as compared to collective impact, in that the term is too broad and resources are scattered and/or groups compete for similar and also wildly different visions.

Chapter 7: Radical Futures/Mundane Present: Three Stories of the Material Configuration of Future Visions

7.1 Introduction

In previous chapters I addressed how different dimensions of futures visions perform as rhetorical devices in order to examine how future expectations impact decision making about the future in the present. I argued that the definition of transhumanism is flexible and open to many interpretations and therefore transhumanist groups are fragmented, making it difficult to garner resources and investments.

Having examined the ways in which expectations inform decisions, this chapter examined the ways in which expectations become configured materially. Konrad et at. (2016) argue that "expectations may also circulate as indirect, materialized assessments of the potential of an emerging technology, as in when, for instance, a government invests in a technology. The very act of investment … can be unpacked as statements revealing a commitment to a particular future." (p. 467). Investment, be it socially or financially is a key aspect of future visions becoming successfully enacted. As previously discussed, transhumanist visions becoming more mainstream is one way in which these expectations are materializing, in widely circulating rhetoric about the future, or in popular cultural representations of the future, such as particular themes taken up in science-fiction or popular media. In this chapter, I examine how transhumanist visions become manifest materially. In particular, I examine anticipatory objects, or in other words, how these visions become configured materially, as in material objects.

Using the sociology of expectations theoretical lens, I examine how the rhetorical processes of promised futures materialize and what implications they have. I do this by first discussing how the materiality of futures is conceptualized within the sociology of expectations framework, in that

rhetorics about the future *do* something and perform in particular ways. Then I examine social and financial investment through the SE theoretical framework and the conceptual lens of the mundane.

Having examined transhumanist visions and how they influence decision making, this chapter examines the material objects becoming configured or repurposed from these visions. I examine the material implications of future visions by analyzing three stories about technological manifestations of future visions. I argue that transhumanist future visions are radical and grandiose in scale and that the ways in which they are presently becoming materially manifested is mundane. I illustrate this argument through three technological story examples. This chapter focuses primarily on data from non-transhumanist actors, such as technologists and scientists, who are familiar with transhumanism but do not consider themselves transhumanist. I spoke with non-transhumanist social actors, mainly working in technological innovation, to understand how transhumanist visions come to influence society and especially how technological future visions become configured materially.

Each of the following three stories are uniformly structured, with an introduction to the story, followed by the main radical future vision informing the story, then I examine the social and/or financial investment narratives that interviewees discussed, followed by my analysis of the mundane expression of present material configuration of the visions.

The first story is called *Innovation Over Invention* and examines the radical vision of embodied sensorial technology, as discussed with Interviewee #22, an entrepreneur and CEO of a small tech start-up company. This story examines narratives that Interviewee #22 stressed about the importance of responsible and ethical innovation, which to them was indicative of repurposing already existing materials into new technological innovation, rather than invention for inventions

sake. However, Interviewee #22 discusses the difficulty of both social and financial investment in new technological ideas. This story represents the radical visions/mundane present by discussing a rather stereotypical technological start-up story, in reaching for the stars with an innovative technology while struggling with the fickle nature of social and financial investment.

The second story examines cyborg technologies, in *Cyborg Science* as discussed in depth with Interviewee #21, an engineer and one of the world's first cyborgs. Within this story, I examine the radical visions of becoming cyborg through the means of embodied technology. Interviewee #21 discusses two cyborg experiments in this story, an RFID implant in their arm and a BrainGate implanted into their brain. Specific financial implications are discussed through the funding implications of these experiments. I analyse the present mundane implications of this story through the lack of social investment, as expressed by Interviewee #21's disappointment that their cyborg experiments did not inspire others to follow in their footsteps.

The third story analyses medical interventions for longevity in the story of *Near-Future Anti-Aging Science*. Interviewee #16, a science communicator whose work focuses on anti-aging, offers a rich account of how existing medical technology, such as diabetes drug Metformin, is being repurposed into an anti-aging medication. I examine the subversive use of existing technologies as well as the fuzzy boundaries surrounding anti-aging science. Both financial and social investment are discussed through the difficulty of gaining funding for a broadly defined target, such as anti-aging within the medical field, as well as the social implications surrounding how to define a project such as anti-aging/longevity in a way that is understandable and translatable to the public. The mundane present is examined in the long road ahead for anti-aging technology even through something as mundane as a drug that already exists and is in use today.

I use fragmentation as an analytical concept to describe the distinctive division between materialized enactments of future visions. The main distinction of fragmentation that I make throughout the analysis of three narrative stories is between the categorization of medical and therapeutic technologies and technological future visions. The final two stories in this chapter discuss a definitive distinction between the intended applications of technology of technological visions. For example, in *Cyborg Science*, Interviewee #21 described their experiments as unique because of the scientific nature of the intention of the experiments, as opposed to therapeutic, or in other words for medical intervention purposes. Alternatively, in *Near-Future Anti-Ageing Science*, Interviewee #16 discusses the social reception of anti-aging drugs as a medical intervention as being much better received than through a futurist or scientific experiment lens. By fragmentation of material configurations, I mean that there is a particular enactment or intention behind the material configuration, in this case mainly between medical and scientific applications.

I then examine the implications of transhumanist visions on the configuration of materiality based on empirical data from this study. I elaborate on the methodological and contextually blurred boundaries as well as the tension between speculative transhumanist future visions and the material configuration of those visions.

I conclude that the present material configurations of future technological visions are mundane, therefore this chapter is framed by examining the present materialization of transhumanist future visions.

7.2 Technological Stories: Past, Present, Futures

7.2.1 Introduction

This section is structured around interview narratives and will examine the stories of three separate interviews in order to analyze the material configurations of transhumanist future visions.

These three stories feature non-transhumanist actors, such as technologists and scientists as opposed to transhumanists actors.

All three stories will follow the same format, wherein each story will have in introduction, then a radical future visions, followed by a section on social and/or financial investment, which in these cases, act as the rationalization for why these visions have not fully materialized. I conclude each story with the present-day mundane material manifestation. These categorical distinctions are not always discrete, just as the dynamics of expectations are not discreet categories but are entangled and intertwined. For example, social and financial investment most certainly impact the successful or unsuccessful outcome of future visions.

Although these three stories represent a small sample size, they capture a broad representative illustration of the conversations I had with many of the non-transhumanist interviewees, as well as corroborate many of the reflexive transhumanist narratives as illustrated in earlier chapters, such as those who see transhumanist visions as becoming re-named or taken up under different projects and objectives, for example, effective altruism.

7.2.2 Innovation Over Invention

7.2.2.1 Introduction

Not all future visions come to be configured materially, and even when visions become scripted in material ways, the chance of failure is likely. As illustrated by this story, there is a sense of the need for responsible innovation today, especially with the smaller or independent scientists and entrepreneurs that I spoke with for this project. Social investment surrounding innovation appears fickle and there are clear political, financial and equitable dimensions at play within the materialization of future visions, as illustrated within this story.

This story examines Interviewee #22's perspective on the need for innovation over invention, in which they discuss the repurposing of existing materials and technology for novel uses. I argue that the repurpose or novel use of existing technology is important because it is indicative of contemporary ethical and responsible innovation. Additionally, this story examines failed futures through the difficulty of securing both social and financial investment for innovative technological development by a small start-up. The mundane present expression of this radical future vision is illustrated through the immense R&D budgets that are wasted by big tech companies, as according to Interviewee #22.

7.2.2.2 Radical Future Vision: Embodied Sensorial Technology

Interviewee #22 described themselves as an entrepreneur, a fixer, and an innovator. They are the CEO for a small start-up company that is focused on innovative sensory technology. Their technological vision aims at innovating an embodied technology, that looks like an encased computer chip, that becomes implanted in one's skin, with the aim of adding a new or novel sense to human beings. Interviewee #22 described their vision: "it started from a very simple idea that everything that we ever created, thought or felt started from a sensory input. So that is basically how we understand the world, every feeling, thought or creation that we have started like that. So, if we were to have new sensory inputs or extended or innovative sensory inputs, we can maybe start understanding things in different ways." (Interviewee #22). The future vision involves beyond human senses in order to facilitate more than human thinking and experiences. They framed these visions within the desire to make both large and small connections in the world that are mainly looked past as human beings, for example, understanding something akin to the butterfly effect, where a small action has a big impact, whose correlation may constantly be overlooked.

7.2.2.3 Investment: Rocket to the Moon

This section examines the difficulty enrolling social and financial investment within the context of a small technological start-up company. Interviewee #22 described the difficulty and major change in their company in trying to identify a client base for their sensorial technology.

> I'll tell you what's happening with [my company] because basically, we are doing a very big change in the company, and we are swapping it from being a business to clients to a business to business. So, we basically stopped selling products to people out there. And we are building technologies for different things. And the reason why we decided to do that is, for example, if you think about your nose, there are so many things that use your nose for, smelling and breathing, of course, but you can dangers, you smell good stuff, you smell perfume, the smell of food, you smell clothing, you smell your partner, you smell so many different things. So then all these are basically different industries. The smell of perfume is an industry. The smell of the food is another industry, even the smell of your partner is another industry, because it's a type of food that he eats, maybe a type of perfumes that he used, or soaps that he used, etc.
>
> So, then it put us in a situation where we are basically creating products that can fit into so many industries, because, just like your nose, our sensory devices can fit into different uses. But we don't have all these markets. So, imagine that you had a company that from day one does perfumes and food and groceries and cars, and whatever it's called, like that cannot really happen. So now we license our hardware and know how to different companies that they do have in these markets. And to give you an example. So. One of the obvious uses for a sense of orientation is a and connectivity is for blind people. So now we start working with an organization of blind people for them to use our technology in their own way. But then they already have the audience, so I don't need to deal with it. My audience is not blind people when blind people are looking for new tech, for the community, they are not coming to [my company]. (Interviewee #22)

They addressed the difficulty in determining and attracting a client base for their technology. Although we did not discuss the financial details of funding the start up in and of itself, this description from Interviewee #22 pointed to difficulty in gaining both social investment, which in this case is indicative of a client base of public interest in the technology. This also correlated with financial investment in the purchase of the products as well.

Furthermore, Interviewee #22 discussed the difficulty in enrolling social interest in novel technological innovation. Interviewee #22 discussed that even when people describe that they

support innovation and novelty, they are often hesitant when investing their own resources in new technologies. Interviewee #22 described that while people like the idea and excitement of technological opportunities, when faced with participation or social investment, the most natural reaction is for people to hesitate. Of Innovative technological investment, they gave the following example:

> But one interesting thing, speaking of society, is how humanity accepts innovation. So, we can, let's think of an experiment, let's imagine that we are both in Toronto now, and we leave, we go to the cafeteria at the university. And we say, 'Hey, guys who would like to go to the moon?' and everybody was saying, 'Me, me, me!' right? Because who doesn't want to go to the moon? And then, after everybody signs up, you're like okay, that's really good because the rocket is just outside, and we can go now. And then in that moment you will see how people will go. 'Yeah, I really want to, but I have a class just now,' and 'I have an appointment that I really need to run to.' So, we would end up with an empty, or almost empty, if not fully empty spaceship. So, people love the thinking of innovation and love to linger with a thought, and to have a lot to say about it. But when it comes to actually moving into it, it takes more, a bit more courage when there is an actual big leap forward. (Interviewee #22)

Interviewee #22 described social reactions of hesitancy when putting themselves or their own resources on the line in support of future visions. However, this is one perception of social participation, which is indicative of an often-critiqued aspect of transhumanist future narratives. For example, transhumanist actor, Ray Kurzweil, is often critiqued for stating that very few futurists truly understand exponential technological growth, because humans think in a linear way. This example, in a sense, states that most people do not understand the pace of technological growth over time. Interviewee #22 made a similar claim of critique in their discussion that social actors do not really understand what is at stake, or that they do not understand the revolutionary aspects of technological innovation and therefore do not invest themselves.

7.2.2.4 Mundane Present: Repurposing Material

On the topic of investment, Interviewee #22 described difficulty in enrolling actors and therefore their company transitioning away from a business to client model and towards a business-to-business model, of which the success of this transition is yet to be known. With their investment and resources concerns in mind, Interviewee #22 discussed the enormous amount of money and recourses that are wasted everyday by big technological companies and the need therefore for innovation over invention.

> So, [a] topic that I often speak about is the difference between, or what I see between innovation and invention, and I think that at this stage of history we need to focus more on innovation and less on inventing and I will explain this. So, we live in a world where the rhythm of life that we created is so fast, too fast. [We are] basically taking a bite out of an apple and then we don't even have time to finish the apple. And then we [move on] because, there is the next apple to take a bite out of, and the next apple. So, then we end up with a bunch of apples that everybody took a bite out of them, and they all go into the garbage. And that creates a lot of damage. (Interviewee #22)

Interviewee #22 discussed their concerns around waste and damage with the pointed example of an apple. They also discussed a solution to the overconsumption and issue of invention for invention's sake in describing their company's mission for innovating with existing technology and materials as well as making sure to make intentional decisions around not chasing the newest technological innovation for the sake of having it. There is a sense of responsibility within this mission of innovating without creating damage, which I took to mean, in this case, environmental damage, as well as potentially the human damage of blindly consuming the latest gadgets.

Interviewee #22 further discussed anecdotally that the money that Google spends on research and development in the span of a year could feed the whole of humanity for a few decades. My reply to this statement was included my sense of being overwhelmed by this anecdotal statistic:

> (Dayna)
> Wow, okay. That takes a minute to digest.

(Interviewee #22)
Okay, so that's the kind of stuff I mean, when you go to the big players to Microsoft, to Facebook, to Amazon, their R and D budgets[4] are beyond any country, any kind of government, any kind of thing, and they just throw huge amounts of money on everything, and 90% of these things never happen. So, yeah, so someone needs to say, 'Hey, should we actually do that? Is there a point in doing it?'

Interviewee #22 pointed to both the obvious and hidden costs of the materialization of future visions in the form of innovative technology, or 'failed futures' as SE literature conceptualizes it. Interviewee #22 discussed the staggering statistics of research and development budgets of 'the big players,' stating that of these massive amounts of money spent, the majority of the projects never come to fruition. Despite large financial investment, not all future visions are equal, and many future visions do not become successfully materialized. Tutton (2017) cites van Lente (1993) when arguing that "expectations are words that do things" (pg. 482), and in this sense, statements about expected futures become scripted into the material design of artifacts. However, not all visions come to pass or are equal in terms of their potential to come to fruition. While not all future visions are expected to become successful, as Borup et al. (2006) argue: "the under-performance of the future is itself to be expected." (p. 295). Tutton (2017) cited both Pollock and Williams (2010) and Geels and Smit (2000) who argue "it is not the case that any expectation if taken up by the right actors could be materialized. … The past is littered with failed futures, which did not come to pass in the way their supporters imagined." (p. 483). Therefore, what Interviewee #22 discussed is both implicitly the expected failure rate of technological innovation, along with a critical lens on the ethical use of materials and money invested.

[4] According to Trendlinehq.com, collectively, the 5 big tech companies - Amazon, Alphabet (Google), Meta (Facebook), Apple and Microsoft, spent $229.1 Billion on R&D in the 12 months ending March 31, 2024. (June 4, 2024. Big Tech's big R&D bill. Trendline. https://www.trendlinehq.com/p/big-techs-big-r-and-d-bill).

In this case, Interviewee #22 discussed how large technology corporations spend budgets that could feed the world's population, knowing that the majority of the projects will fail, which also means that inevitably, the 10% or so that do become successful, are successful enough to cover the budgets of the failures. It is in an example such as this, that Interviewee #22 discussed slowing down and making intentional and conscious choices about consumption and participation in these markets.

7.2.3 Cyborg Science

7.2.3.1 Introduction

The following story is about cyborgs technology as experimented with in the early 2000s, by Interviewee #21, who can be described as one of the world's first cyborgs. The contested definition of cyborg is examined along with the implications of the material configuration of brain implant technology, including risks, ethics, funding, and the lack of social interest. Interviewee #21 contended with the idea that their experimentation with cyborg technologies is both writing the future and ahead of its time, a point which I argue presents these grand cyborg visions as mundane. This cyborg visions of Interviewee #21 have not become successful in enrolling support, and therefore despite the experiments themselves being successful, they have had little impact on broader cyborg technological innovation.

Interviewee #21 defined a cyborg as a technologically augmented human, which, through a technological implant, gains an extra human ability. This definition is in tension with a concept such as Haddow's (2021) 'everyday cyborg,' which is illustrative of humans with implanted cybernetic devices. Haddow's (2021) everyday cyborg is indicative of therapeutic treatment through implanted medical devices, which do not add an extra human function to the body, but

repair a vital human function, such as a pacemaker. This tension is perhaps indicative of the lack of support garnered to support Interviewee #21's cyborg vision.

Interviewee #21 described that there are many who designate themselves or are ascribed the title of one of the world's first cyborgs. In this sense, cyborg is not dissimilar to transhumanism, in that it is a contested term with many meanings and can be a self-identity or prescribed by others based on their own understanding of the meaning of the term.

Gray (2000) captures the multiplicity of meanings and contested nature of the term 'cyborg.' Gray (2000) argues that cyborg politics must be thought of beyond dichotomous relationships often associated with techno-hybrid humans, such as natural or unnatural, human or machine, organic or constructed, horrifying or thrilling. Gray (2000) argues that the figure of the cyborg has made these dichotomies ineffectual. Gray (2000) argues that cyborg politics run much deeper than these dualities and are not adequate descriptions of the possibilities and subjective identities of cyborgs. "First, there are many different types of cyborgs and many different ways to categorize them. For example, cyborgs can be restorative, normalizing, reconfiguring, and enhancing. People are used to thinking of cyborgs as people for whom lost functions have been restored, maybe even to the extent that they seem "normal" again, but we have largely ignored the ethical implications of recon-figured and enhanced posthumans." (Gray, 2000, p. 11).

Haraway (1987) has famously troubled the boundary between materialism and idealism through her conceptualization of the cyborg. I presented this argument in chapter 2 under '*Real' or Imagined Futures*, arguing that Haraway's (1988) representational coyote figure compliments Tutton's (2017) wickedness in describing the relationship between material and human, future and present, and dreams and unintended consequences.

This story examines the radical vision and mundane present of the cyborg as told by Interviewee #21.

7.2.3.2 Radical Visions: World's First Cyborg

Interviewee #21 is an engineer and a researcher, who holds an unofficial title of world's first cyborg. During our interview, Interviewee #21 described the experimentation they engaged in with cyborg technologies back in the early 2000s. They discussed a series of experiments involving implantations, and described that their first implant was not, in a sense, revolutionary cyborg technology, however, some considered it such.

The first experiment involved implanting an RFID (radio frequency identification device) under their skin. The RDIF that was implanted was not made for human implantation but was a piece of a computer.

> The first implant I had really just identified me to the computer in the building [RFID implant]. And we then got the computer to open doors for me and switch on lights and say hello. Think very much like a smart card would have done the same, it was good fun and a nice experiment. Whether it was a cyborg or not. Some people said so. It's up to them. (Interviewee #21)

Even though the RFID technology was not meant for the human body, they felt it was safe enough to experiment with. It was only after the implant had been removed that Interviewee #21 realized the fragility of the implant that was meant for computers and not human beings, highlighting the glass outer casing of the implant. About the material of the RFID implant, they explained the risks:

> A little glass tube was implanted, it was never designed to be implanted, it was [meant to be put] into computers and things like that, and I was giving a talk to a newspaper about 6 months later. I was holding one of these little implants and I dropped it on the floor, and it just shattered into pieces. I realized if someone had come up to me and gone. Hello, how are you? (demonstrates patting themselves on the arm) Hammered on the thing it could have just broken into pieces and I'd have had all sorts of [problems]. So, you just don't [know]. You can say, 'oh, it

> was all okay and everything's fine and no problem at all.' But you just don't know [the risks beforehand]. (Interviewee #21)

Interviewee #21 described the subversive use of an object that is meant for computers and implanting into their body. Borup et al. (2006) argue that although visions become scripted materially into objects, the uses of these items will inevitably be subverted or reinterpreted in terms of novel usages. As argued by MacKenzie and Wajcman (1999), technologies are not neutral and acquire meaning through their use. Technologies are interpretably flexible, in that they are used differently between different social groups (MacKenzie & Wajcman, 1999; Pinch & Bijker, 1984). Interviewee #21 used the RFID in a novel and subversive way by implanting it in their body, which in that case came with an association of risks, some which were known before the implantation and some that were unknown until after the removal of the device.

The second cyborg experiment involved implanting BrainGate technology, wherein Interviewee #21 underwent voluntary neurosurgery in order to experiment with a BrainGate implant that affected their nervous system. The goal of BrainGate was multifaceted, which Interviewee #21 described, in that they wanted to experiment scientifically, in that the technology was available, and why not, as well as wanting to provide foundational research from medical applications. The BrainGate implant experiment for Interviewee #21 was purely scientific and not needed for therapeutic use for themselves.

> But the second one was the BrainGate implant they put into my nervous system. I was the first person to have a BrainGate implanted, although they probably don't like me to say that. Again, it's been used more for purposes of where people are paralyzed and not trying to get around to rewire the nervous system. So, I think mine still in that sense is the only experiment to use the BrainGate in a different, more scientific rather than medical way. (Interviewee #21)

Interviewee #21 described the groundbreaking science they were engaging in, which, in that case, included significant risk.

> … with the BrianGate it was so basic. We had no idea beforehand what signals, electronic signals to push into the nervous system that my brain would recognize because nobody had done it before. There are no books, when nobody's done something like that before. There were some books on the nervous system, but they were so basic. It was unbelievable, and even then, they were inaccurate, we found. They're probably still inaccurate, in terms of frequencies of signals and things like that. So, we found out an awful lot of stuff, but we had to experiment. We experimented by drawing signals and then increasing the voltage and trying a bit more, and then try. But again, you sort of have we gone too far? Don't know! I mean we were pushing electric power into my nervous system, into my brain. Are you going to go too far? If someone says I'm going to push 50 volts, we were applying 20 Microamps, small. The current was small, but we were applying 50 volts to my brain. What's that going to do? So, we're very much, just … (licks finger and holds it in the air) Let's see what happens. That was the only way (smiling).

I asked Interviewee #21 about their reasons for engaging in such risky scientific experiments, which obviously imply a plethora of personal risks and ethical concerns, which falls into the category of a proactionary approach (More, 2013b). Interviewee #21 described how they wanted to help people to whom this technology could be rehabilitating, and therefore, they contextualize this experiment within a medical/therapeutic context as opposed to scientific. They described their use of the technology falling into the scientific category, with the goal of research for medical use.

Interviewee #21 made a definitive distinction between medical use and scientific or experimental applications of this technology. They went on to describe the cyborg abilities that the BrainGate gave them during the experiment.

> The three abilities that I had, which I didn't have as a regular human. One: We plug my nervous system into the Internet, and even with feedback as well, I was able to control a robot hand. So, I was in [New York] and controlling the robot hand back in England. But I could feel how much force the hand was applying. That was great fun. So that's having part of your body extended across a network which I think, in the future, I mean, why not? So, at the moment with a human, your body is just where you are, and you're just an individual entity, and you can continue up like we're doing now (virtually), you know, remote sensation, but actually wiring yourself into the network is something that is clearly, well, not just

> possible, I mean, tick the box, we can do it and it can give you abilities well beyond human abilities. That's one.
>
> Two: was different sensory input, humans have a pretty limited sensory range, and we can look to upgrade that, improve it, get more senses in. Whether we want to or not, I don't know, whether they're useful to the brain, I mean we'll see. But I did experiment with ultrasonics … [which] gave me a very accurate sense of distance to objects, which is not what we have normally. So, you could say it was replacing vision in some way, but it was an extra [sense] for me. My vision was still there, so it was like an extra sense for me on the point that it worked …
>
> And the third thing was, my wife had electrodes in her nervous system, and we linked our two nervous systems together. So, when she closed her hand, my brain got a pulse (squeezes their hand shut in demonstration), ding, ding, ding, ding. And so that is very, very basic telegraphic communication for nervous system to nervous system which, to my mind, telegraphic, well, it is the same as telephone, that it's a very simple end. ... Also, if it's nervous system, you can do it by brain. So, brain to brain communication, certainly a new form of communication, I think, is a definite for humans, transhumans, whatever, cyborgs of the future. And at least we did it. I'm amazed, though, I mean that was back in 2002.

This cyborg experiment was successful in gaining Interviewee #21 beyond human abilities for the time of the scientific experiment. The BrainGate is not a permanent therapeutic intervention for Interviewee #21, and therefore they only experienced these extra senses and abilities temporarily.

7.2.3.3 Investment: Funding Cyborg Experiments

Despite the lack of collective or social investment in Interviewee #21's cyborg vision, which I discuss below, I inquired about the financial funding for a project like the BrainGate experiment, which required a surgical suite, neurosurgeons, engineers, researchers, etc. Interviewee #21 laughed comically when I inquired if the funding was provided by the university. They described the piecemeal approach of sourcing money for the project, as well as the donation of the surgeon's time which in effect contributed to their own research.

> No, the university [did not fund this], I guess I was at a laboratory there, and they were paying my salary, and so on and so forth. In that sense the University was helping to support it, but … over the same time, I had a big group that I had built up through doing different projects. And one of the projects was a robot

> magazine… and it actually brought in loads of money and helped to pay for the researchers. So, I laundered money, you know, legally laundered money. I took money from one source, from what we were getting for honorary and effectively our share of the [contribution form the] magazines and paid for four researchers who worked full time on this project.
>
> The medical input, which was important, was that they said they would help, they would do the project, so we didn't have to pay for the medical input. We had to pay for the operating theatre, just for that day and a few small things, but not for the surgeons and things like that. So that was their input. They gained for research papers, which for one of the surgeons, it's still his top cited paper. One of the papers that came out of the project. So, things like that. So it wasn't that anybody came up and said, here is a load of money. Go ahead and do this project, but it was just getting it from here and there, making sure that put the show on their road. (Interviewee #21)

Interviewee #21's use of the BrainGate technology was subversive and this approach to funding the experiment is indicative of the lack of social investment for a scientific project like this, as opposed to something that may be medically or therapeutically framed.

This example, as I discuss below, illustrates an example of a failed future vision. The experiments themselves were successful, however, Interviewee #21 described bitter disappointment that the research has not been picked up by others, especially since these experiments are now decades old. High expectations do not always lead to successful enrollment of support.

The rationalist expectation approach, as according to Borup et al. (2006), considers that hype is associated with investment that people begin to make in expectations as opposed to the fundamentals. However, there is uncertainty or disappointment built into the hype cycle, as discussed in chapter 2. This example is illustrative of Interviewee #22's story of recruiting students for a trip to the moon, it is easier to say one is interested, but when it comes to putting oneself at risk or outside normal comfort zones, participants are far less apt to take part. The BrainGate experiment then becomes something of a failed future, in that disappointment was part of the process, however, not in the sense of over promising hype, in which case the technology could not

deliver as expected, but in that the technology is not sufficiently without risk or beyond an experimental phase for scientific application.

Interviewee #21 described being ahead of his time with cyborg experiments like the ones he performed, and I have to agree. The lack of support at the time of experimentation and since, is indicative of lack of interest, and in this case, the experimental subversive use of therapeutic technology was perhaps ultimately unexpected and inappropriate. Obviously, the nature of scientific experimentation, and especially funding within science is demonstrative of needing to be on the cutting edge or forefront of one's field, however, the experimental use to gain abilities with therapeutic technology falls into the often-critiqued transhumanist narrative of indulgence and individualism. Although Interviewee #21 had goals of gaining knowledge for therapeutic use of the BrainGate technology, their experiment could be seen as highly frivolous and incredibly risky.

7.2.3.4 Mundane Present: Writing the Future

Interviewee #21 described the present mundane aspects of their cyborg visions, in that their work has not been taken up in continued and innovative ways. When I express my surprise at how long ago these experiments had taken place, Interviewee #21 expressed their disappointment that this type of experimentation has not been taken up in an experimental fashion since their work in 2002. They mentioned feeling ostracized from their academic community and they were surprised and disappointed that more academics have not experimented with these types of cyborg experiments. Keeping in mind that Interviewee #21 is using cyborg in a way that describes gaining a beyond human function.

Interviewee #21 further rationalizes that their research may have been too far ahead of its time, which explains why it has not been taken up by others.

> So, two things. I felt at the time. Wow! This [BrainGate experiment] will change the world. This is like Alexander Graham Bell with a telephone. And it was sort of met with, you know, 'what the hell are you doing? I don't understand what you're doing.' And so, it's very, … I was quite disappointed with that. Didn't have the effect I thought that it would at the time. Maybe I didn't do it right.
>
> I thought by now there would be thousands of people with, … everybody is going to have this. Yeah, let's go to a corner shop, put your arm there (to pay) or put your brain there. So, I'm really surprised. I know there are dangers associated with it but come on! So, I'm quite disappointed other people haven't gone that route, and surprised. (Interviewee #21)

Interviewee #21 felt ahead of their time when performing these experiments and described the discussion they had with others about writing the future.

> When we did that experiment, [the technical guy], in 2002, was saying, really, that we were sort of writing the future. But probably for the next 30-40 years it would go unnoticed by a lot of people, and then somebody would, … in a way, I'm expecting somebody to do the experiments again and people will say, 'Oh, wow! You're doing that! That's what it is!' and for it to have more of an impact. Which is a little bit like when you look at Charles Darwin, he's got a fantastic name and reputation. But what he was saying and talking about, there was Herbert Spencer, for example, who was saying the same stuff about 20 years before. People would go, 'oh that's interesting,' but then it wasn't just that Darwin said it, but he said it in the right way at the right time. People were ready to receive it then. So, I'm probably one of those that will be forgotten by the world. Somebody, like Fred Smith, or somebody, will be extremely famous in about 30 years' time.

This description of 'writing the future' is interesting in that Interviewee #21 and their colleagues reflexively understood the process they had engaging in, knowing, at least partially, that there would be a significant delay between this work and a successful scientific uptake. Therefore, this experiment, although successful, continues to work as a vision for the future, in that it did not gain wider academic or social success, in terms of the scientific application.

7.2.4 Near-Future Anti-Aging Science

7.2.4.1 Introduction

This story is illustrative of a material manifestation of transhumanist future visions, in the example of longevity technology. Interviewee #16, an anti-aging science communicator, discussed the future visions of repurposing existing diabetes medication into longevity technology. Difficulty in securing funding within the medical system for a broad endeavour like 'anti-aging,' as well as in difficulty communicating these visions to both medical professionals and the public provide the context for the manifestation and materiality of these visions. I argue that this story is illustrative of a mundane manifestation of grandiose future visions because of the incremental and unproven results of this technology.

7.2.4.2 Radical Visions: The Longevity Pill

Interviewee #16 is a science communicator specializing in the topic of aging biology, or human longevity. We spoke extensively regarding the near-term advances within science and medicine that may result in an anti-aging medication. Interviewee #16 defined this phenomenon as anti-aging, by which they mean risk of death decreasing.

> The likelihood of risk of death with age, [is] incredibly striking [in] how rapidly our risk of death increases as we get older. I'm 37, so my risk of death this year is about 1 in a 1,000. But if you make it to 65, it becomes 1 in 100. If you make it to 80, it becomes 1 in 20. If you make it into your nineties, it's somewhere around 1 in 6. And these numbers just really shocked me, and I thought we know older people are more likely to die. But there's a sort of magnitude of that increase in the fact that it's exponential … So, you hear this number, that's over 100,000 deaths a day are caused by aging, and that's because obviously, aging goes on to cause cancer, it goes on to cause heart disease, dementia, stroke, diabetes, all of these things that are the biggest killers in the modern world are caused essentially by the aging process in large part. You can get cancer in youth, but it's much, much rarer. (Interviewee #16)

Interviewee #16 described their definition of anti-aging as the risk of death through aging not increasing exponentially or decreasing. Furthermore, Interviewee #16 discussed the near-term future vision, which they described as materializing within the next 5-10 years, for longevity breakthroughs by the means of repurposing existing medical technology. They addressed both the relative safety as well as affordability of existing medical technologies that have the potential to be repurposed into anti-aging medications, such as Rapamycin and Metformin. When I asked what kinds of breakthroughs exist in anti-aging technology, Interviewee #16 replied:

> I think there are quite a few things in the pipeline. There's nothing proven in humans yet for a variety of slightly frustrating reasons. But there are things that are hopefully going to be available, I think, within the next 5 to 10 years that can either slow down or partially reverse aspects of the aging process. There are drugs like Rapamycin. … There's another drug called Metformin, which is a diabetes drug, and these are both off patent medications which have shown promise in slowing down aging…those are 2 drugs, there's a trial for Metformin that's been intending to get underway for about the last 5 years. But it's still scabbling around for the last few tens of millions of dollars of funding that it needs and if that were to be enacted, and it would take like 3 to 5 years to find out whether Metformin does genuinely slow down the aging process. And that's an off-patent drug, it costs like cents per pill. We could just roll that out to the whole over 60 population almost immediately, because it would cost nothing, and it's incredibly safe. We understand from decades and decades of using this in diabetics that there aren't many serious side effects to it. It's very rare to get serious side effects. So those are the kinds of things these repurposed, existing drugs that could, if the trial were done, be rolled out relatively quickly. (Interviewee #16)

Interviewee #16 gave a rich account of the potential to repurpose existing technology to slow down the aging process in humans. They addressed a specific and relatively close time distance for anti-aging therapies for a collective population of over 60. The distance of 5 to 10 years, along with the utilization of a technology that already exists and has existed for some decades urges action towards human trials as well as funding to repurpose a drug like Metformin. The temporal dynamics here are in the promise stage of the hype cycle or even in a pre-hype stage. I argue that the nearness of these anti-aging visions, urge present action in a different way than the

previous two stories. The nearness as well as the potential large-scale impact of this vision enacts a different type of both social and financial investment, in that it should be immediate and large scale.

Borup et al. (2006) speak of the subversion or reinterpretation of materialized technologies from their ideal expectations. “Ideal expectations of future users and their attributes are literally and materially scripted into technologies and socio-technical systems, though these will inevitably be reinterpreted and even subverted in usage.” (Borup et al., 2006, p. 288). I understand the repurposing of existing medication, or the innovation over invention to be indicative of the process that Borup et al. (2006) describe. In this case, the medical technology in question is not novel, however, the technological use is repurposed to fit a new vision, to treat aging instead of diabetes like Metformin was designed to do. Using existing technology, like Metformin, for which trials have already proven relatively safe, even if it has not yet been proven to slow aging, over inventing something new and untested. I argue that this repurposing is a particular material enactment, or particular form of materialization, similar to what Interviewee #22 argued for, where this technology does not have to be invented, but innovated in a different way. In this particular case, the repurposing enacts a particular investment, as described by Interviewee #16, where this particular drug has already been proven safe and effective for diabetes treatment, therefore, there is a history of research and rigorous testing from within the medical system, which I hesitate to say there is wide trust in. The call to action therefore, around this type of technological materialization is very different from the type of material configuration from the previous story, which was widely experimental.

7.2.4.3 Social Investment: Fuzzy Boundaries and Fragmentation

Being a science communicator, Interviewee #16 communicates with the public about the science of longevity, or what they somewhat reluctantly call anti-aging. They extensively unpacked the use of terms upon my inquiry about whether longevity, or immortality were appropriate. Interviewee #16 stated that the defining of terms around this subject is difficult, often stating it is a 'minefield,' because aging means different things depending on if you are speaking scientifically, medically, colloquially, or in marketing. Therefore, the fuzziness of boundaries and difficulty defining strict use surround Interviewee #16's terms, just like Interviewee #21's terms as well as the usage and definition surrounding transhumanism. Additionally, this section examines contradictory or fragmented meanings between the perspectives of medical technological use and scientific or experimental use. I have used fragmentation in the previous chapters to describe the fractured transhumanist social groups, illustrating that although these groups are part of a larger whole, there is more separating them than keeping them together. In this chapter, I argue that the division between the classification of visions, as scientific or medical, creates a significant difference in how these visions are enacted towards becoming materially configured.

One of the issues in gaining social investment is in how to communicate these visions succinctly to a broad audience. Interviewee #16 described the difficulty in succinctly and efficiently communicating their work on anti-aging science. Interviewee #16 addressed the social aspects of aging, "a lot of people think of the social aspects of aging and the accumulation of wisdom, and the seniority of wisdom. And those aren't bad things. It's good to accumulate wisdom and become more senior and all this other stuff." However, it is difficult to disentangle the often-competing definitions of aging and anti-aging science and to label longevity or anti-aging science with a clear meaning, as they describe. "So, it's very hard to disentangle all of that stuff and come

up with something that pithily encapsulates the fact that you are just trying to maximize human health and happiness, and even that has its own problems because utilitarianism has a sort of chequered history." (Interviewee #16). These fuzzy boundaries surrounding terms illustrate the example of the difficulty in gaining social investment and public enthusiasm for the idea, because there is difficulty in even exemplifying what is meant.

Even though Interviewee #16 is somewhat removed from transhumanism, in that they research longevity from strictly a medical perspective, their struggle to unpack terms speaks to the multiplicity and weightiness of loaded terms. Furthermore, in unpacking medical and scientific ways to described anti-aging, they end up invoking proto transhumanism.

To describe their use of anti-aging, Interviewee #16 described:

> So anti-aging [as a term], not great. Immortality though, immortality is really problematic, because the strict definition of immortality is never dying, and even if you're like some uploaded entity in a computer distributed across galaxies, like there is still going to be the heat death of the universe so there's still, some small chance that all of your copies get erased, or whatever it might be. So that's just like a bit of a non-starter. But at the same time, I don't really think that longevity, implying just lifespan, really encapsulates the quality of life as well. So, it's a really hard thing to give a concise name to … people do talk about longevity science, so there's an extent to which you just have to sort of go with the flow…. So, it's a minefield, but I think probably anti-aging is the most, you know, succinct way to start the conversation. But then there is sort of levels of terminology you can advance through.

On the difficulty of an encapsulating and easily communicable term, Interviewee #16 continued:

> Yeah, it's tricky. And I had problems with this because there's a sense in which anti-aging is something that a lot of people in the field don't like. For example, because it's got, firstly, it's got the connotations of like, you know, skin cream… So, there's that sort of modern quackery perhaps. Some of it is quackery. Then there's the older forms of quackery where you know anti-aging elixirs from the fifteenth century, or whatever searching for the Holy Grail and the elixir of life, and all that kind of stuff. So, it's got all this baggage associated with it. And there's some level on which aging isn't, like what I really want to do, if I could somehow allocate all human resources and science funding, and so on, I'd be aiming to do

> something, roughly speaking, like maximizing human happiness and reducing suffering, and that kind of broadly utilitarian way of thinking about it. … But actually, what you want to reduce is the overall chance of death. It just so happens that a huge fraction of that is caused by the aging process. And so, I talk about anti-aging. (Interviewee #16)

Interviewee #16 addressed that using the term anti-aging, where others use longevity, or even immortality. They described using very particular, and familiar language to describe some of the aims and goals of the anti-aging endeavour, so that it is more widely accessible. This is in an attempt to elicit a strong and broad enactment of these visions.

Interestingly, however, they used very particular examples, such as the elixir of life and the Holy Grail, both of which are invoked within examples of proto transhumanism by More (2013a) in chapter 5 and by O'Gieblyn (2017) in chapter 4. Whether these ancient narratives have become cannon surrounding longevity projects because of the use by transhumanists, or whether they are more broadly synonymous with human endeavours to overcome human fallibility more widely is beyond the scope of this project, but worth pointing towards. This use of examples serves to create a fuzzy boundary between the medical/scientific experimental divide that has been so intentionally curated.

Similarly striking are the description Interviewee #16 used for the goal of anti-aging, which they describe broadly as "maximizing human happiness and reducing suffering." The description of these goals in the broader sense, even though Interviewee #16 when on to describe their goal more specifically, align harmoniously with the transhumanist pillar of super-happiness. I argue that even though Interviewee #16 does not consider themselves a transhumanist, this example is striking in the impact that transhumanism has had in permeating the fields of longevity, in that even within the medicalization of anti-aging science, this particular scientist relies on transhumanist narratives and tropes to describe their goals.

I now turn to focus on the fragmentation in defining longevity technology within medical or scientific realms. I asked Interviewee #16 about the distinction in categorization or perspective, between a medical intervention and the scientific or experimental intervention, as Interviewee #21 described this distinction. Interviewee #21 used the term medical to describe therapeutic technological use, as in a human regaining a lost human skill or function, and scientific to describe adding a superhuman function. However, Interviewees #16 understands anti-aging technology as an extension of modern medicine in and of itself.

This example is indicative of the fragmentation I described between the boundaries of an anti-aging project being grounded in modern medicine or scientific experimentation. While both of these projects do co-exist, the framing of Interviewee #16's visions are collective. While these visions are described as definitely rooted in medicine, which is obviously itself, indicative of highly rigorous scientific experimentation, Interviewee #16 invoked transhumanist tropes around this project, signalling the pervasive nature of the influence of science-fictional type visions like transhumanism, as I discussed in chapter 5.

The framing of these visions makes them perform in certain ways. There is then a contradiction between using medication for human longevity in being dichotomous between natural or unnatural, human or beyond human. I further elaborated on my question to Interviewee #16 during the interview, inquiring about a potential distinction between the unnatural aspect in the scientific or beyond human intervention, and a seemingly natural aspect to a medical intervention in aging, especially in the way Interviewee #16 qualified it. I argue that there is a definitive distinction in reception and general comfort between medical intervention and technological intervention within future visions.

I asked for clarification around the mundane aspects that Interviewee #16 implied within longevity technologies, which contrasts with the radicalized forms of life extension prophesized in transhumanist visions. I asked Interviewee #16, "why isn't this getting attention?" I further inquired, "why isn't this getting funding? And to use a kind of cringy word, is it not quite as 'sexy' as 'we're going to create immortality with technology!' Right? Is it just not as attention or headline grabbing?" They discussed that it is a disservice that transhumanist discourses tend to get lumped together and therefore not accepted because they are too far future and too weird for people to conceptualize their futures this way.

> And I think one thing that's really held back discussion of a lot of these sort of transhumanist topics is they're often all lumped together. The weird stuff and the nearer term stuff, and I think, mind uploading is a really fascinating one. It's something that I thought about talking about in the book, but then ended up just thinking, this is, it's just too wacky, and people hear that, I'm not sure I super want to be uploaded into a computer. But I'm definitely a 100% behind doing as much as we can for aging research. And so, I think that sort of when you talk about are these people wanting to live forever? And Ray Kurzweil and his sort of singularity stuff it's about the AI's getting smart enough to cure all diseases, but it's also very rapidly about those AIs then uploading us into computers and us becoming the AIs ourselves. And I think that's just, you talk to people about things like colonizing the galaxy with these computers that are going to, these probes that are going to spread out our consciousness across the universe. That's just so distant from the things that people care about in everyday life. You know it's not about families or relationships or friends. It's about bonkers, disembodied brains like spreading out through space. It is a shame that those things get lumped together, because maybe we will gradually get to a position that's something that happens to humanity. But I think other people aren't ready to consider that just yet. (Interviewee #16)

Interviewee #16 continued to unpack a conflation between philosophical futurist visions and the medical lens that they use and the disservice this does to the overall anti-aging endeavor.

While most transhumanists are aware that their visions are controversial, Interviewee #16 described a generally warm reception to his work. Furthermore, Interviewee #16 elaborated on the way in which their message is received by the general public. They explained that the amount of time they have to deliver their message is important, as people have preconceived notions

especially about futuristic headlines, whereas they discuss life extension as an extension of modern medicine.

> The responses really vary, and I think it depends how long you get to deliver the message, to some extent and it also depends how you present it. So, if there are some scientists or some futurists who say 'humans are going to be immortal or are going to live to a 1000,' or whatever it might be, and often that's something that journalists will ask you as well, it's kind of the knee jerk response, and I think people react quite negatively overall to that kind of extreme life extension. But I think if you present it as I see it, actually I'm not even having to do some kind of PR job on this to make it more palatable. *I genuinely see this as an extension of modern medicine* [emphasis added].
>
> So, if you think about someone who's researching cancer, what are they looking to do? They are looking to give people more life. They are looking to give people a better quality of life. That you're trying to improve the lives of human beings, and I think the only difference between something like cancer research or heart disease disease-specific research and research into aging is that the aging research has the potential to tackle a root cause of all of those diseases and be preventative and therefore more effective, but I don't really see that distinction, but something I think you find a lot when trying to talk about this stuff is that in the mind of the public there is this huge distinction. …
>
> If you do present it as something that's medical, something that's about increasing quality rather than quantity of life, the response is just much more positive. I think most people, if you have long enough to explain, [that] you are not extending the period of frailty at the end of life. You're not just trying to make people live longer for the sake of it. It's not like immortality we are talking about. If you say you want to try and prevent all these diseases which you know, if I talked about researching those diseases specifically, you'd be very happy to be supportive of. I think most people do get it. And it's not as though you need 20 min to make this case. I think you can make it in 5. It's just a sort of 1 min headline is often immortality, you know, crazy billionaires doing this, that and the other, that aspect of it, I think, gets real pushback from people. (Interviewee #16)

Social investment therefore depends on the type and length of message. Longevity is more palatable when discussed in the medical context and not doing wacky experiments, which was also indicative of the *Cyborg Science* story. There is a definitive distinction in how the message is received depending on how it is delivered. Selin (2008) argues that the authority of who presents the visions gives the visions legitimacy. In this case, the framing of these visions carries the legitimacy and expertise of the medical system, where even if there is not implicit trust in this

system, there is a knowledge of particularly rigorous standards. Transhumanist messages are received cooly, as fantastical, pie in the sky type thinking, whereas similar ideas come across as much more normalized when put into a medical context as communicated by Interviewee #16, as someone who is a regular communicator of complex scientific ideas.

7.2.4.4 Financial Investment: Scrambling for Funding

Despite this relatively close and cost-effective potential of the longevity technology Interviewee #16 described, there is lingering reluctance of investors and limited investment for this type of technological repurposing. This is why I argue that this particular repurposing of Metformin into an anti-aging medication is in a pre-hype stage. As Brown and Michael (2003) argue, future visions are typically in a pre-application state, where their utility and value has not been demonstrated, and are contingent on investment mobilization. Despite the overwhelming positive effects this vision possesses, it is still in the depths of enrolling both social and financial support.

Both previous stories address similar sentiments in the difficulty of social investment and uptake within innovative technologies. Within the medical context, Interviewee #16 described the difficulty of funding for treating aging:

> There are obstacles in terms of, it's hard to get a drug approved to treat aging as a thing, because, they normally have to treat a specific disease, or a specific 'indication' is the jargon. So, there are effort's underway to try and sort that problem out. But nonetheless, [there] are 2 drugs, there's a trial for Metformin that's been intending to get underway for about the last 5 years. But it's still scabbling around for the last few tens of millions of dollars of funding that it needs and if that were to be enacted, and it would take like 3 to 5 years to find out whether Metformin does genuinely slow down the aging process. (Interviewee #16)

Interviewee #16 described the difficulty in the boundary of the term 'aging' not indicative of being a specific disease worthy of medical attention, despite, as they stress aging being linked

to many diseases of old age that take a significant number of lives. As in previous chapters, although themes in these stories are divided discreetly, there is entanglement and complications throughout, these themes and dimensions of materialization of future visions are not discrete and distinct. The fuzzy or difficult boundaries surrounding definitions of terms, such as the 'minefield' Interviewee #16 described aging as, impacts the availability and willingness of financial investment.

Interviewee #16 described the public funding landscape for anti-aging research, describing the paradoxical situation of how little money is allocated to aging research in comparison to the overall impact it could have on health and happiness.

> I think the funding situations are really paradoxical ones, because we're at a point where we've got like super exciting science to, you know, there's enough to write a book about and do loads of interviews about and whatnot and it's definitely worth publicizing and like shouting from the rooftops, but the sort of paradox is at the same time the funding is woefully insufficient given the sort of exciting potential this field has. And my go to example, for this is the National Institutes for Aging in the U.S., which is the part of National Institutes for Health that specifically focuses on aging. And the first issue here is the reason I choose the U.S. partly because it is the world's largest research funder. But secondly, it's one of the few, in fact, and perhaps only places in the world that has a specific part of the government devoted to funding aging biology. I tried to work out how much we're spending in the U.K. and no one knows … it's not really thought of as a distinct sort of pot of money or a distinct area of research that needs funding. So that's problem number one is that it's just not recognized.
>
> Then, if we drill down into the U.S. numbers, National Institute for Aging, so the National Institutes of Health has a budget of about 40 billion dollars, the National Institutes of Aging has a budget of 2.6 billion so that's much less than 10%, getting down to sort of 5% almost, and there's always this running joke in aging biology circles that NIA stands not for National Institutes on Aging, but national institute on Alzheimer's disease, because the lion's share of that money then goes to dementia. The NIA neuroscience division, super important research, but not as important as understanding the aging process that gives rise to that condition in the brain that allows the dimension to develop.
>
> And if you then drill down to the aging biology division. So, the people who are actually looking into the biology of aging, that gets 350 million dollars a year, which is about one dollar per American. And that's crazy because aging has an 85% chance of killing you, if you live in the United States. And yet you are spending a dollar a year trying to understand that process and do something about

> it which is wild. Health care costs, I think it's $17,000 per person in the U.S. and the majority of that health care spending is on the chronic diseases of old age. It's the diabetes, it's the cancer, it's the dementia, it's the health care, the social care for all of those people with these like drawn out extended periods of care because of aging. And yet a dollar a year on the National Institute on Aging, trying to actually sort this problem out.
>
> So, there's just this incredible wild mismatch between the potential of the field and how much funding it gets, and that isn't to say science in general is well funded. Even the National Cancer Institute, which is another part of the NIH that gets, I think, 6 billion dollars a year, which is about $15 per American. So again, cancer, second biggest killer in the States, I'd happily spend, where I a U.S. citizen, more than $15 a year trying to sort that out. And yet No. So that's the sort of funding landscape situation. It's very confusing, and it feels like for a relatively small amount of money we could make an enormous difference given how much progress we've made with this, absolute pittance [we make do with]. (Interviewee #16)

Interviewee #16 described a tension around the funding body in the US for health and aging research, while describing that there is no data on the numbers of funding for related research in the UK. Konrad et al. (2016) argue that both implicit and explicit investments into future visions can create commitments for certain futures to materialize and emerge. “Expectations may also circulate as indirect, materialized assessments of the potential of an emerging technology, as in when, for instance, a government invests in a technology. The very act of investment, together with the accompanying promotional material, can be unpacked as statements revealing a commitment to a particular future.” (Konrad et al., 2016, p. 467). Konrad et al. (2016) use the example of government investment as indicative of a commitment to particular futures, which is illustrative of the example Interviewee #16 used. The U.S. government, in this example invests, even if insufficiently, in aging research, while the U.K. government investing in aging research is either non-existent or the amount invested is obscured. If investment speaks to commitment, lack of investment is also indicative of lack of importance towards particular speculative technologies.

The further tension Interviewee #16 described is the amount of money being invested in aging research and the impacts it could have. Additionally, they added information on the private sector support for longevity endeavours.

> I was just saying about the private sector providing some funding and talking about the slightly baffling story of Altos labs, which is this company that's been founded by Jeff Bezos and a bunch of other wealthy people, with funding of 3 billion dollars to explore this idea that's called cellular reprogramming. And what's sort of fascinating about that as a concept, is that it's this incredible technology that allows us to seemingly reverse the age of cells in a dish. There's some evidence that it can reverse age in actual full-size animals. But it's, I would say, one of the more speculative hallmarks of aging to intervene in it. The technology that is required to do it is quite advanced. And so it's rather incredible, it's not a sort of conventional startup in the sense that I'm not sure they're going to see a return in 5 years. I think they'll see a return over the long term. I think it's a really fascinating, exciting technology. But you know, as a conventional investment, it's not a smart one. It's like something that's got a much longer time horizon than you'd normally expect in venture capital or something, so there is some extent to which the private sector is coming in.
>
> But the problem is, I think, the reason that that technology has got the level of investment it has is *it's like super-hot. It's like all over the media* [emphasis added]. And it's really exciting, because it literally reverses the age of cells. It's not like it's doing some minor equivelary biochemical thing that is hard to understand. …
>
> So I think it's just really important that we do drive more funding to the field, because and particularly more government funding, because a lot of this stuff isn't in an investable place like if you've got billions and billions and billions like Bezos[5] and you're willing to take a part on this stuff that's fantastic, but most of it isn't at the point where, like normal venture capital or pharma companies are going to be willing to step in and do the research. And it needs to be gotten there by State actors who are able to take that huge risk. The fact is the return will be worth it. (Interviewee #16)

Interviewee #16 discussed the implications of funding for anti-aging science. They discussed their concern over the potentially long-time horizon and the complications that causes between private and government funders. Financial investment is a big component of the configuration of the materialization of future visions, in that future visions need investment to

[5] According to Forbes Real-Time Billionaires List, as of June 19, 2025, Jeff Bezos' net worth is $227.2 billion. (https://www.forbes.com/real-time-billionaires/#5da6135f3d78).

become materialized. Interviewee #16 described different levels of investment associated with risky investments between public and private funders.

Interviewee #16 expressed concern and what is at stake with the lack of public/government investment in a project like cellular reprogramming. If the project remains privately funded, there could be both foreseen as well as unforeseen risks and consequences down the line. Not to mention the unaddressed, but lingering connotations of eugenics within cellular reprogramming and STEM cell/gene therapy. Interviewee #16 addressed their concerns over cellular reprogramming in its most extreme form.

> It literally turns cells back to, you know, being embryonic cells is that if you do it in its most extreme form. So, my worry is that if it's funded in this sort of piecemeal way by the private sector, then imagine that they succeed in cellular reprogramming, and all of our cells can be restored to incredible youthful states. But then adults might still have damage in their DNA. Because this technology does nothing to address that they might still have problems with what's called the extracellular matrix, the sort of stuff that glues all our cells in our body together. There are just a load of hallmarks that aren't connected, and not necessarily going to be fixed by this technology, and it will be very frustrating if that works, but a load of other stuff is left undone, and we get killed by the other 8 hallmarks of aging that we haven't sorted out. (Interviewee #16)

The stakes of investment are high and an important consideration within future visions. I have discussed risk and time as important dynamics in enrolling financial investment in future visions.

7.2.4.5 Mundane Presents: Incremental Possibilities

This section has examined the promising visions of near-term longevity medication. While Interviewee #16 is a science communicator, and therefore this vision is grounded within the medical field, some transhumanist visions of longevity take this anti-aging science to a much further extreme. As discussed previously with Interviewee #16, transhumanist visions invoke grander scales of immortality. The mundane present material configuration of this technology is

that it is not yet proven, still scrambling for funding, and offers incremental possible life extension. I explored this mundane present with Interviewee #16.

In the discussion of mundane enactments of the future, Interviewee #16 elaborated on their expectation for anti-aging technology to roll out, explaining that it will likely happen in a piecemeal manner. We discussed in depth that these types of technological interventions will roll out in a more mundane and gradual way and are likely to be framed as more of a medical intervention, rather than a complete and sudden kind of total life transforming technological intervention.

> What's going to happen first is that partially because it's hard to get a drug approved for aging, as a sort of broad thing, and also partly because these are experimental therapies, they've only been shown to work in mice. They'll initially target patients who've got particular diseases where we know that senescent cells are an issue. And so, for example, age-related macular degeneration, which is a form of the most common form of blindness in people over 65 and there's another condition called idiopathic pulmonary fibrosis. You can just shorten that to lung fibrosis, and that is a disease that has essentially no treatments at the moment. It's a sort of one-way ticket to gradually reducing lung function, and it's very unpleasant.
>
> So accordingly, people with that disease are fairly willing to try out something that might help, and the early trial results are indicative that it's sorting in the right direction. We haven't got the full results yet. But … I think most importantly, if it's safe in those patients and there aren't any serious side effects, we might think well, it works in these patients with this really severe disease, why don't we try it in patients with heart failure, which we also know is connected to senescent cells. But we already have a bunch of cardiology drugs, and interventions that we can use …
>
> But maybe if it's safe for those people with pulmonary fibrosis, maybe we can start handing these things out to people who have less severe diseases like heart disease. And then again, if it's effective and safe in that population. Maybe after that we can give it out to people who are in their 50s or 60s, whatever the threshold turns out to be. They've got enough senescent cells that it's worth clearing those cells out proactively. [But] you don't want to be causing any harm by giving them these medications.
>
> If we get lucky and one of these 20 or 30 companies [working on these applications] makes a breakthrough and gets their drug approved for a particular indication, then what we could find is that it's going to be a few years for them to sort of get a bit of safety data, a bit of real-world data. And then it spreads out to a wider patient population. *It could be within 10 years that we are trying these*

> *things out as real anti-aging drugs, like proper preventative drugs that were given out to people who would currently think of them as healthy. So that's super exciting and super near term* [emphasis added]. (Interviewee #16)

We continued our discussion, where I emphasize, "So it's incremental right? It's not like, okay, tomorrow, we are taking the pill and we're all immortal, right?"

> Exactly, yeah. And I think that that's the important thing. Sometimes when I talk about a cure for aging, people assume it is going to be one pill, but it's not, It's going to be the a patchwork of treatments, and at first a patchwork, I think, of quite imperfect treatments, as we understand more about the biology, and that will partly be driven by developing, say we develop a senescent cell removing treatment that works in humans. … But even then, I don't think we're ever going to have a single immortality pill. I think it's always going to be some combination of things. You'll go and have a checkup every year, however long it might be. That'll look at your biology and give you some combination of things to bring it back into that sort of optimally healthy range. (Interviewee #16)

When invoking a transhumanist vision of longevity or immortality, a trip to your family doctor who prescribes you a pill that may add incremental amounts of time to your life, is not generally speaking, the visions that come to mind. In a world of sci-fi popular culture, powerful technology always at our fingertips, and AI becoming smarter all the time, our visions of the future are generally more grandiose. What Interviewee #16 described, in terms of medical intervention and rollout for longevity is a mundane expression of these epic longevity and transhumanist visions. Bell (1999) argues that "there are few – if any – final solutions. Rather there are corrections, and then, new designs and more corrections." (p. 303-304), which is indicative of Tutton's (2017) conceptualization of wickedness having no final solutions, but having to constantly re-solve problems.

There is a temporal aspect to discussed by Interviewee #16 as well, in which they describe the near-term plausibility of these technological interventions. Although Interviewee #16 is discussing a relatively near-term timeline, Tutton (2017) argues that there could be long term impacts on short term goals. "Moreover, the timescale over which futures unfold adds a further

complication since what might appear relatively benign over a 50- to 100- year duration, might become far more pernicious over a much longer time." (Tutton, 2017, p. 487). As discussed in previous chapters, the near or farness of future visions elicits action in different ways (Michael, 2000). Although seemingly mundane, the impacts of the technologies that Interviewee #16 discussed could have a near-term and profound impact on human life, albeit more gradually than popular future visions would have us imagine.

> But [treating aging is] quite plausible near term, like some of the hallmarks of aging will be able to be treated with things like drugs, and we obviously know how to develop drugs. We know how to do trials for drugs. It's not like wild twenty third century medicine. And then when you start getting onto the more out there sounding stuff, things like gene therapies or STEM cell therapies, these aren't things that are like decades and decades or centuries and centuries into the future, because we already, have gene therapies in the clinic there have been a few approved, and again the same sort of story applies …
>
> But as we cut our teeth on this gene therapy in people with really severe problems, then again, we can start getting more and more confident, maybe we can give this to people who have less severe problems, maybe we can just give it to the general population and introduce longevity genes that we know can improve human life span into everybody. Maybe we'll be handing these things out to literally every living human. And so, I wouldn't want to get gene therapy this week or next year, or the year after. But in 10, 15, 20 years' time I would be shocked if we aren't doing some kind of longevity gene therapy and the same for something like STEM cell therapy.
>
> So, they can sound super futuristic. But if you're thinking, maybe 10, 20, 25, 30 years down the line, I'm very much hoping to still be alive and like the average person living on planet Earth, I think, is in their thirties, so that most people alive today are going to be around in order to see the results of these therapies, and even more so if you think there are going to be therapies that arrive sooner that will allow people to live a little bit longer, and then benefit from those therapies as well. So, you know, if I eat well, if I exercise, if I benefit from the first generation of senolytics, which might be the first thing, if rapamycin turns out to work, and I had a few more months or years or whatever it is, to my life, then that gives me more time for the gene therapies and the STEM cell therapies to come through, and that then, of course, buys you even more time for whatever the next generation of therapies is going to look like.

Finally, Interviewee #16 addressed that there is an aspect of both science and luck to see these drugs come to work for longevity efforts.

> So, this feels like something that could just not work, we have to get lucky to some extent. That's what science is like, but equally, this isn't something that's like, you know, I'd be very surprised if I came back in the year 2500, and we hadn't cured aging, but it's not something that we have to wait till the year 2500 to achieve. It might be something that happens in the next 10, 20, 30, 40 years, and it won't be a cure in the sense that you know, in 2045, I'm certain I will not be able to give anyone a pill that magically makes them biologically immortal. But we might already be on that path where the medications are extending people's lives, and people are staying healthier for longer, that allow them to benefit from the next generation of medication, and that takeoff point will come at some point in the future, and it's sufficiently soon that it matters to people who are alive today, whether we'll actually make it or not is an open question. But with sufficient funding. It's not completely mad to suggest that. (Interviewee #16)

There is simply a chance that they will not work in the subversive way Interviewee #16 hopes they will work on anti-aging. Furthermore, Interviewee #16 described the relative safety of drugs such as Metformin, however there may be unknown consequences in rolling it out to the population at large. Different dose needs as well as side effects in those who are otherwise healthy should be of concern. Tutton (2017) argues that "we struggle to anticipate or fully know the future consequences of our actions or those of others. We might act with the best of intentions, but our best intentions can produce unintended consequences, unforeseen effects, and unanticipated events can stall, complicate, or end prematurely our dreams." (p. 487). In this sense, Interviewee #16 elicited a cautious optimism in the efficiency and timeline of repurposing existing medication for longevity impacts in humans.

7.3 Tension Between Speculative Future Visions and Their Material Configurations

Having analyzed the material manifestations of speculative future visions, this chapter has illustrated an interesting tension, between the configuration of future visions and the nature of transhumanist visions themselves being highly speculative. Based on the data collected through interviewing, there is a clear tension in the absence of concrete material technology being discussed by transhumanists. This section serves to situate the methodological and contextual

landscape that I encountered while working on this specific chapter regarding the configuration of the materiality of transhumanist future expectations. I illustrate not only the difficulty in bordering the distinction between interviewees or insider/outsider boundaries, but also the difficulty within the absence of concreteness concerning questions about the configuration of the materiality of transhumanist future visions.

My understanding of transhumanism is that it is largely a philosophical and theoretical endeavor. The sample of transhumanist interviewees that I captured included academics, politicians, and activists. While some worked in technological sectors, they did not conceptualize the technology they worked on to be transhumanist technology, per se. As described by Interviewee #5 and Interviewee #21, transhumanism is a lot of talk.

Interviewee #5, an academic and well-known transhumanist, described the actions of transhumanism to be largely talk and debate. They address the early days of the internet bringing like-minded futurists together before ultimately many of the people involved moved into professionalization and careers:

> What happened in the 90's was a lot of talking ideas, some people had more practical projects like the cryonics organization always had to have some liquid nitrogen and treating patients they always had to deal with the actual real world, and many people had software businesses and other things, but it was a lot of talk. And I think what happened then in the 90s was a big cohesion building exercise as the web emerged … [and helped] people [to realize], 'oh there's something called transhumanism and I'm actually in it.' So that helped them link people to organization … so it became broader and there were a lot more debates and different interpretations, which still was a lot of talk.
>
> I think what happened somewhere around the turn of the millennium … there was a professionalization happening, and many of us felt like we needed to step up here as public intellectuals and argue our case … And then of course you also got many people starting organizations. It's easy to be on a mailing list and spend a lot of time debating when you're a student. Eventually you need to work on your PhD, and you dropped out of mailing lists. After that, you might start your company, or you might go into the academic area. So, what has happened is, of course, that cohort is now starting to be professors or running companies or having organizations. So, we are all out in the real world, which means that we're quite

> often not debating. It's very sad to go back to the Extropian mailing list these days." (Interviewee #5)

While there are centres of technological innovation investing in transhumanist future visions, such as the Singularity University, in interviewing transhumanists, I got the distinct impression that there is more mundane and individualized action towards prospects of longevity, such as eating well, exercising, taking supplements, or investing in preservation methods such as cryonics.

As an example of a mundane expression of transhumanist visions, Interviewee #9 discussed their transhumanist advocacy in terms of everyday mundane actions (Adam, 2005), that they describe as keeping themselves healthy and happy. They used the term 'advocacy' to describe their work, and this term was not proscribed to them. I asked Interviewee #9 what their transhumanist advocacy looks like in a day to day, week to week, or year on year basis, trying to get an idea of what the tasks of the leader of a transhumanist social movement looks like. They describe both staying healthy mentally, physically, and emotionally, and encouraging others to do the same.

> So, there's a few different approaches to that for me. One is ideological, [they discuss their involvement advising and participating in social transhumanist groups]. On the practical side. I both use myself, and I run a business to help other people use a lot of dietary supplements. Yes, both cognitive enhancement and for healthy aging. I practice intermittent fasting. I work out at the gym on a very regular basis, usually about 4 times a week. I try and usually succeed at getting 7 and a half hours sleep every night. I practice prayer and gratitude and meditation on a regular basis. I tried to foster positive social relationships at church and other places. All these things improve my mental wellbeing. All these things improve my physical health, and I do them because I want to be in a position physically to contribute to building the kind of world that I aspire to live in with people that I love, and so you know that's just kind of part of who I am. (Interviewee #9)

Aside from the vested interest in the supplements company, I use this example to illustrate a mundane everyday action type of expression of grand transhumanist future visions.

To come back to Interviewee #5's discussion, transhumanist actors are representative of philosophers or debaters of technological innovation, rather than the creators of such. Interviewee #21, an engineer and non-transhumanist actor critiqued transhumanists as being proverbial armchair philosophers:

> When you look at transhumanists and who are transhumanists, the vast majority seem to be philosophers or sociologists, looking at theoretical scenarios. Sometimes with quite a nice idea of how to practically get there, or what that might mean. But very often, you know they have just forgotten the practical possibilities, because it is trans*human* [emphasis in original]. So, we're looking at humans as some sort of start point, perhaps, and going [from] there. So, there's not too many activists, [in the sense of] activists trying to actually do something … It is much easier being a philosopher and sitting on your backside. And just, yeah, 'I think, I think ...' So that's my grumble. I feel I ought to try. Even, you know, even people like Ray Kurzweil ought to get out there and actually try something. (Interviewee #21)

Interviewee #21 offered a critical take on the practical inaction of transhumanists. Although this was Interviewee #21's personal view on this community, it illustrates the difficulty and tension I felt throughout the process of analysing data and speaking with transhumanists, regarding the difficulty in discerning the practical and material processes involved in their future visions. While I considered that this may be indicative of the segment of transhumanists I interviewed particularly, Interviewee #21's statement is also indicative of this absence.

Therefore, this project sought to capture non-transhumanist actors who work within fields related to scientific and technological innovation. Talking to scientists, engineers and technological innovators produced much more tangible results on the materialization of future visions. Transhumanist visions were difficult to nail down materially, in part because of the heterogeneous and individual opinions on what can be defined as transhumanist technology. For instance, Interviewee #6, an outspoken transhumanist activist, spoke of both vaccines as well as gender affirming surgery as transhumanist technologies, in that vaccines extend health and longevity while gender affirming surgery can be seen as an expression of morphological freedom.

Morphological freedom is a term coined by transhumanist Max More (1993). Sandberg (2013) argues that morphological freedom falls under the ancient human drive for self-creation through self-definition. As per Sandberg (2013), "I would view [morphological freedom] as an extension of one's right to one's body, not just self-ownership but also the right to modify oneself according to one's desires." (p. 56). However, I argue that both examples fall into the anachronistic fallacy trap, discussed in chapter 5.

Interestingly, Interviewee #12, a transhumanist and innovation coach, also spoke about transhumanist interest in vaccination, when they spoke about the US Transhumanist Party advocating for Covid vaccinations to be made available sooner. The US Transhumanist Party is an American political party focused on "pursuing a peaceful political revolution for longevity," by "putting science, health, and technology at the forefront of American politics." (*Transhumanist-Party.Org*, n.d.). Interviewee #12 described More's (1993) proactionary principle, which is a counter to the precautionary principle, when describing balancing the cost or risk versus reward within technological innovation. Transhumanists lean towards the proactionary principle, in that the proactionary tends to focus on benefits where precautionary focuses on risks. Interviewee #12 described: "We balance the cost of both, because there's a cost of doing, and there's a cost of not doing, and the cost of not doing can be hidden. For example, the Transhumanist Party pushed to have vaccines for Covid made available sooner than they were." They continue to describe that the Covid vaccines were developed quite quickly, however, human trials took a year, within which time there was an obvious cost of human life and suffering.

> The problem is COVID-19 is part of a family of viruses that we have been experimenting on for 10 years. These viruses had been treated with early forms of the messenger RNA vaccines, and they were all safe and effective. So, we have something that has a reasonable expectation of being safe and effective … And I would advocate that we should have let volunteers … be able to take that early, and I would have been one of them. I would be using the proactionary principle

> to say, if I take it, these bad things could happen, and if I don't take it, these bad things could happen. I think I will [take it]. That is what the proactionary principle is about. So, we had an opportunity [but it] cost a year of people dying, and that first strain of Covid 19 was the most deadly. (Interviewee #12)

Interviewee #12 illustrated the proactionary principle with a globally relevant example. I use this example, no to illustrate vaccines as transhumanist technology, per say, but as an example that was presented in more than one transhumanist interview. Vaccines were one of the more tangible material technologies presented throughout my interviews with transhumanists. Otherwise, my interviewee's spoke of the ethics, risks, and hopeful aspects of speculative technology. I am arguing that claiming vaccines as transhumanist technology displays an anachronistic fallacy. Additionally, in the examples of vaccines being presented as transhumanist technology, I argue that these examples illustrate rather mundane expressions of grandiose transhumanist future visions.

This section has discussed the tension between the speculative nature of transhumanist future visions and the material configuration of these visions, illustrated with empirical evidence that came from outside of the three stories above. The stories within this chapter focused on non-transhumanist actors, and therefore this section served to include evidence regarding transhumanist narratives themselves. I conclude this section be arguing that transhumanism becomes enacted or performed, through rhetoric, as I have examined throughout this project, but has, itself, not become widely influential within technological innovation sectors.

7.4 Conclusion

This chapter has examined the material configurations of transhumanist future visions by explicitly examining scientific and technological innovation. The three stories in this chapter have outlined material configurations of future visions and their implications, which in all three cases have turned out to be much less successful than the grandiose futuristic narratives that circulate

around these ambitious visions. I have examined the ways in which transhumanist visions have materialized within technological objects. I have analyzed that the present expression of these visions, manifested in material form, are mundane. For better or worse, the technological objects examined within these grandiose narratives have turned out to be subversive uses of existing technology. I am not arguing that invention needs to be practiced over innovation for future visions to materialize in grand ways. Whether these materializations are in the early phases of the temporal dynamics of future expectations, or the medical framing of these visions just can't shake the futurist/scientific experiment framing, these visions are not gaining the social and financial support that their innovators expected, and therefore their present-day expressions are mundane.

Although SE captures failed futures as a dimension within future expectations, there is an aspect not captured within this theoretical framework that I argue requires further examination. This aspect is illustrated in the reliance of the belief in progress logic within the sociology of expectations literature, however, as expressed by more than one interviewee, this belief in progress logic is not indicative of support for innovative technological social or financial investment, as illustrated by my Interviewees. Selin (2008) argues that the underlying belief and determinacy in technological progress logic offers a powerful rhetoric in support of continual technological progress. Selin (2008) argues:

> The rhetoric that surrounds [technology] produces imagined futures, while concrete technological practices have the power to produce very real futures materially. Moreover, the rhetorical construction of future worlds directly (and indirectly) influences which technologies are brought into existence by, for example, providing justifications for funding, rallying public support, instigating policy directives, etc. The rhetoric supporting new technologies derives legitimacy from the expertise of those making the claims yet also from the wide-spread belief in the determinacy of scientific and technological progress. (p. 1879)

While future visions have the power to produce material futures, and although the belief in progress logic is encultured, it does not appear strong enough to support material investment.

Progress logic seemingly informs how we make decisions about the future; however, what innovators are describing is a lack of enthusiasm and investment, social or otherwise, in their innovative work. This hesitancy, I argue, is in part due to potential known and unknown risks or uncertainties, and due to the temporal dynamics of the technology. As discussed in previous chapters, the process of delayed investment (Michael, 2000) can go beyond financial investment, but is here displayed as a delay in social investment also. Surrounding innovative technology, many want to see 'bugs' worked out first (Rosenberg, 1976), or wait until the technology is proven to be safe and effective.

Chapter 8: Conclusion

8.1 Introduction

This chapter offers brief concluding thoughts on the project, including a summary of the research objectives and how they were addressed, the projects theoretical and methodological contributions to the field, an overview of the general findings and a reflection on the direction of a future project.

8.2 Project Objectives

For this project, I set out to investigate the real-world implications of transhumanist future technological visions, seeking to go beyond the grandiose performativity of these vision, drilling down into the most granular levels of, 'what do transhumanist future vision actually do?' Based on the scholarly framing of this project within the field of STS and therefore the analytical lens of the sociology of expectations the research objectives were threefold based on how the future is studied within SE, which include examining discourses, decisions and materiality of transhumanist future visions.

My first objective was to examine transhumanist discourses, where I interviewed transhumanists in order to identify what core values and principles frame their future visions. In chapter 5, I examined the implications of transhumanist discourses by analyzing transhumanist core values and principles. I argued that proto-transhumanism commits a fallacy of anachronism based in its tendency to retrospect prospects (Brown and Michael, 2003), or look back on past future expectations through a contemporary lens. This practice of retrospecting future visions from the past ends up creating a determinist history and places contemporary values on past visions, aka, the past ends up looking like today. The implications of looking to past technological

development and labeling it transhumanist creates a false legitimacy of a longer history than formalized transhumanism has.

Additionally in chapter 5, I examined the ways in which contemporary transhumanist visions proliferate into mainstream technological future narratives. I argued that while future technological discourses have become more popular within mainstream media, that because of the contradictions and disagreements within transhumanism, it is difficult to trace its influence on these mainstream discourses. Transhumanism and its actors remain marginal to mainstream innovation even though technological future visions are becoming more popular. I also argued that the value of the term transhumanist remains marginal because of its multiplicity and lack of coherence throughout its social actors and groups.

My second objective was to examine how future expectations in transhumanism influence present day decision making about the future. I addressed this objective in chapter 6, where I examined how transhumanist future visions impact decision making about the future in the present. I analyzed the ways in which transhumanists understand their future visions to perform in a way that creates particular meaning making within positive valuations of the future. I examined transhumanist future visions as both collective and flexible, where in one sense these visions are meant to form cohesion between transhumanist social groups or actors, however, I argued that the visions are too flexible because they have no value logic in and of themselves, which means that a transhumanist worldview is open to work in conjunction alongside other worldviews, such as political, religious or ethical. It is in this way that I argue transhumanism is fragmented because there is little to no cohesion between transhumanist actors and social groups.

My final objective included analyzing how the enrollment of current societal resources configured the development of transhumanist future visions. In chapter 7, I examined

technological future meaning making through non-transhumanist actors, where I deeply examined three stories that exemplified my non-transhumanist actor data, wherein I examine the implications of transhumanist future visions on technological innovation. I argued that the impacts of transhumanist future visions on technological innovation have been mundane, wherein grandiose future visions are contemporarily expressed in the repurposing of existing technological objects, such as using recycled materials or using existing medications for novel purposes. I highlighted a tension in the absence of the configuration of the materialization of transhumanist visions, which led me to conclude that these visions are having a mundane effect. I argued that even when looking at future visions through a medical lens, science communicator Interviewee #16 drew on influences of transhumanist future visions within the strict medicalization of longevity. Overall findings will be discussed below.

8.3 Theory and Theoretical Contribution

I have engaged with the sociology of expectations theoretical framework to shape this project by analyzing the way in which technological future visions behave or perform in the world. The performative nature of a future expectation changes the world. Taillandier et al. (2025) argued that transhumanist future visions are a form of world-making, which is at the heart of what I have examined in this project, which included the ways in which transhumanist narrative impact or change the world. By beginning with a question as seemingly simple as ‘what do transhumanist future narratives do?’ I have been able to unpack how transhumanist narratives perform by analyzing the complicated and contradictory values and claims of transhumanist actors through both primary and secondary data. Using the theoretical and analytical framework of the sociology of expectations has provided an STS framework through which to understand how future rhetorics

become a form of world making and further, what impacts those future representations have not only on present decisions making about the future, but also in taking action towards it.

The theoretical contribution this project makes is the addition of the thematic concept of fragmentation to the expectations framework. I use fragmentation to aid in the analysis of a heterogeneous social group with a plethora of future values and goals. I use fragmentation within the specific case study of this project to identify the multiplicity of social groups that represent a fractured state of the transhumanist philosophical worldview. Because transhumanism does not have its own value ethics, and its definition is broad and flexible, meaning that it can support many different worldviews, through fragmentation, I consider the lack of cohesion and defining visions within transhumanism.

8.4 Method and Methodological Contribution

In this project I focused on both primary transhumanist data as well as secondary literature to examine the nuances of transhumanist values and future goals, in order to form a deeper understanding of how transhumanists understand themselves. I argued that there is a tension or fuzziness within the boundaries between transhumanist actors, not only as interviewees, but because transhumanist actors also occupy scholarly, institutional and popular cultural spaces. Because transhumanism is a contemporary phenomenon, which is best suited to the case study method I employed, I was able to draw both primarily and secondarily from foundational transhumanist actors, such as those responsible for the formalization of this worldview. Therefore, I have used empirical data within this project, not only to analyze the impacts of transhumanist visions, by following the claims of transhumanist actors and experts, in order to better understand how these actors themselves are enacted and enact transhumanist discourses as well as what types of actions they engage in to participate in transhumanist future visions.

Transhumanism does not stand for a singular and unified purpose, it has been interpreted through different ethical, political and religious worldviews, and I therefore consider the factions, a variety of social groups, as fragmented. While there are many social groups that work towards transhumanist or transhumanist type goals, which represents its whole, I argue throughout this project that the meaning behind transhumanism has fractured beyond having much influence beyond a personal identity, which is the sentiment I capture within fragmentation. Fragmentation is a term I use to capture the multiplicitous nature of politics, ethics, goals and values surrounding the social phenomenon of transhumanism, which I discuss more thoroughly below in the general findings section (8.5).

A methodological and analytical contributions that my project makes to the field is the way in which I have treated my empirical data. As I began to write up my findings, I quickly began to struggle with the analytical and theoretical fuzziness surrounding transhumanist interviewee as analytical subjects but also their expertise because they also produce academic papers, everyday discourses and practices in institutions. I therefore chose to consider my empirical data as both primary and secondary data. I followed discourses coming from primary actors to take seriously actor claims of transhumanist history, core values, and future visions, in order to understand how they think about themselves, how these narratives unravel and how they build momentum in social and future movements. I take these empirical contributions of my informants seriously, because while there is a plethora of transhumanist secondary sources, I have seen little to no scholarly engagement with primary transhumanist data that takes their visions seriously and investigates the claims through their own value systems.

This methodological choice comes with particular limitations, with the most obvious being that with the emphasis on the self-representation of transhumanist data comes along with the

inherent biases of these views. One of the most obvious biases within transhumanism can be seen within gender, class and racial race dynamics. Transhumanist organizations have historically struggled to appeal to women, according to Bohan (2018), where heavily skewed white male demographics pose a problem.

8.5 General Findings

While I began this project discussing transhumanism as a social movement surrounding a technologically philosophical worldview, I conclude by arguing that although transhumanist actors see themselves as unified through this as an identity or as ideological attached to a social movement surrounding these ideas, upon looking carefully at the core values of transhumanist, my data illustrated there is little to no cohesion between social actors because the values are not tightly defined. Therefore, the ways in which transhumanist future narratives become enacted remain marginal.

Some of the overall findings of the project, I argue, are that transhumanist values have simultaneously become more pervasive throughout our technologically focused society, while also being too broad and having too many values and aims to have had much of a significant impact specifically on becoming configured materially technological ways. The transhumanist social movement, remains marginal, despite innovative technological narratives and development begin pervasive today. Transhumanist philosophical views are not fully understood or agreed with because they are too multiplicitous, too fragmented, too flexible, there are not enough common goals to hold different fragments of the broader social movements together. The goals within transhumanism are so flexible because it has no internal value ethics system, and therefore can support many different politics and worldviews, creating a social movement where politics, ethics, and therefore goals are extremely difficult to agree on, which creates this social fragmentation.

Additionally, many transhumanist visions are too far future to gain significant social and financial investment. Therefore, despite the fact that technological trends abound, I am arguing that transhumanist future visions are both too far future as well as too fragmented to have had major impact on technological fields themselves.

That is not to say that transhumanist future visions have no impact, however. My empirical chapters point to the ways in which the discursive nature of transhumanist visions are fragmented, by which I illustrate that the lack of cohesion within transhumanist values sees a lack of funding and resource accumulation for these visions.

I argue that transhumanist future visions have an effect in society and perform in particular ways. While I argue that transhumanist expectations are not directly shaping technological innovation and development, the influence of their positive valuation on future narratives offer important counter narratives to often-popularized dystopian future vision as well as a critique on the present. However, I argue that the lack of coherence throughout the values and social actors has a negative effect on the impact these visions could ultimately have. While transhumanist narratives showed up in unexpected places, such as with the medicalization of longevity, the fact that methodologically non-transhumanist actors were extremely difficult to engage with about this project speaks to the lack of discernable penetration of these narratives into technological fields.

This is to say that my research has illustrated that while transhumanist rhetoric and narratives influence promises for the future, such as the promise for longevity technology, for example cryonics, or even the repurposing of existing drugs into longevity medication, in the future, the enrollment of social and financial investment into strictly speaking transhumanist future visions remains marginal. Therefore, transhumanist narratives, or at least more broadly, technological future narratives with a positive valuation of the future become evoked in

technological and future promises, but thus far are too vague and too far future to elicit substantial social or financial capital. My research illustrates that the point within technological trends where transhumanist visions become evoked is within its promissory capacity for widely different future possibilities. While their future visions are speculative, transhumanist actors spend a lot of time thinking about the future, and because transhumanists place positive valuation in future visions, their visions illustrate what may be possible with the blended boundaries between human and machine, or what possibilities powerful AI may offer humans in the future. Mali (2016) argues that technoscientific future narratives help us to better understand our current societies. Expectations, and in this case, specifically transhumanist future technological expectations, serve to remind and inspire that the world does not have to be the way that it is, there are many possible futures. Rather than influencing technological practices, I argue that transhumanism becomes evoked within the inspiration or and for future narratives and therefore what may be promised or possible within future technological design.

8.6 Future Work

One of the ways in which I can imagine expanding on this work in the future would be to, instead of following visions and narratives, to follow financial and investment trails, or more plainly put, follow the money. There are currently and clearly very large amounts of money being invested in technological innovation in areas such as risk mitigation, human enhancement, and space travel. So, a line of inquiry following this project may look as follow: who/where/how does investment get made within these technological sectors? What is at stake? In this thought experiment type stage, I would imagine this project to look like a similar type of investigation to this project but with different experts and investors.

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Appendix A: Research Ethics

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Certificate #:	**STU 2021-144**
Approval Period:	**11/26/21-11/26/22**

ETHICS APPROVAL

To: **Dayna Jeffrey**
Graduate Student of Science & Technology Studies
daynajeffrey88@gmail.com

From: Alison M. Collins-Mrakas, Director, Research Ethics
(on behalf of You-ta Chuang, Chair, Human Participants Review Committee)

Date: Friday, November 26, 2021

Title: **Implications of Transhumanistic Visions of the Future to the Development of Artificial Intelligence**

Risk Level: ☒ Minimal Risk ☐ More than Minimal Risk

Level of Review: ☒ Delegated Review ☐ Full Committee Review

I am writing to inform you that this research project, **"Implications of Transhumanistic Visions of the Future to the Development of Artificial Intelligence"** has received ethics review and approval by the Human Participants Review Sub-Committee, York University's Ethics Review Board and conforms to the standards of the Canadian Tri-Council Research Ethics guidelines.

Note that approval is granted for one year. Ongoing research – research that extends beyond one year – must be renewed prior to the expiry date.

Any changes to the approved protocol must be reviewed and approved through the amendment process by submission of an amendment application to the HPRC prior to its implementation.

Any adverse or unanticipated events in the research should be reported to the Office of Research ethics (ore@yorku.ca) as soon as possible.

For further information on researcher responsibilities as it pertains to this approved research ethics protocol, please refer to the attached document, **"RESEARCH ETHICS: PROCEDURES to ENSURE ONGOING COMPLIANCE".**

Please note *that due to ongoing changes with the pandemic, all researchers must review the procedures on the YuBetter website (Section: Coming to Campus) as there may be changes to protocol requirements.*

Should you have any questions, please feel free to contact me at: 416-736-5914 or via email at: acollins@yorku.ca.

Yours sincerely,

Alison M. Collins-Mrakas M.Sc., LLM
Director,
Office of Research Ethics

Appendix B: Research Ethics Renewal

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Certificate #:	**STU 2021-144**
Initial Approval:	**11/26/21-11/26/22**
Amendments:	
Renewals:	**11/01/22-11/01/23**
Current Approval Period:	**11/01/22-11/01/23**

ETHICS RENEWAL

To: **Dayna Jeffrey - Graduate Student**
Department of Science & Technology Studies
daynajeffrey88@gmail.com

From: Alison M. Collins-Mrakas, Sr. Manager and Policy Advisor, Research Ethics
(on behalf of You-Ta Chuang, Chair, Human Participants Review Committee)

Date: Tuesday, November 1, 2022

Title: **Implications of Transhumanistic Visions of the Future to the Development of Artificial Intelligence**

Risk Level: ☒ Minimal Risk ☐ More than Minimal Risk

Level of Review: ☒ Delegated Review ☐ Full Committee Review

I am writing to inform you that this research project, **"Implications of Transhumanistic Visions of the Future to the Development of Artificial Intelligence"** has received ethics review and renewal by the Human Participants Review Sub-Committee, York University's Ethics Review Board and conforms to the standards of the Canadian Tri-Council Research Ethics guidelines.

Note that renewal is granted for one year. Ongoing research – research that extends beyond one year – must be renewed prior to the expiry date.

Any changes to the approved protocol must be reviewed and approved through the amendment process by submission of an amendment application to the HPRC prior to its implementation.

Any adverse or unanticipated events in the research should be reported to the Office of Research ethics (ore@yorku.ca) as soon as possible.

For further information on researcher responsibilities as it pertains to this approved research ethics protocol, please refer to the attached document, **"RESEARCH ETHICS: PROCEDURES to ENSURE ONGOING COMPLIANCE".**

Please note that prior to commencing any research activities, researchers are advised to review the latest updates on research involving human participants at: *https://www.yorku.ca/research/researchers-faqs/*

Should you have any questions, please feel free to contact me at: 416-736-5914 or via email at: acollins@yorku.ca

Yours sincerely,

Alison M. Collins-Mrakas M.Sc., LLM
Director, Office of Research Ethics

Appendix C: Transhumanist Actor Interview Schedule

General Information

- **What do you do?**
- **How did you discover transhumanism?**
- **How did you get into your line of work?**
    - **What attracted you to it?**
    - **And what makes you passionate about it?**

Interview Questions:

- **What kinds of stories or narratives inspire transhumanist philosophy?**
- **What does the transhumanism philosophy do or inspire today? How does it work on the ground? (Give people hope for a better future? Inspire technological innovation?) How do you see it acting in the world?**
- **What does transhumanism look like in the future?**
- Transhumanism: why is longevity such an emphasis? What is it about longevity (living forever) that is so appealing?
    - What happens to population if everyone can live for a century?
- Is existential risk something we need to worry about with AGI?
    - What might be some of the potential costs in terms of voluntary experimentation for life enhancing technologies?
- In your opinion, what is the most pressing issue that transhumanism is facing?
- How is transhumanism received by the general public? (most dangerous idea in the world?)
- Are there religious or spiritual aspects to the transhumanist philosophy?
- What kind of influence does the transhumanist movement have on tech innovation?
- What does the future of tech look like to you?
- Augmentation (diversity), how might politics be handled in this instance?
- How do you and your company think about new technology? How does technological development and change fit into your business strategy? How do you go about evaluating alternative solutions to problems?
- **Is there anything else you want to add, anything I should be asking about and am not?**
- **Can you refer others who might be interested in conversations like these?**

*Bold questions indicate primary research questions which include my primary objectives and were asked of every interviewee. Additional questions were asked based on time available.

Appendix D: Non-Transhumanist Actor Interview Schedule

General Information:

- **What do you/does your organization do?**
- **What is your role in your organization?**
- What is your organization's involvement in innovative tech?
- **How did you get inspired/involved in this work?**

Interview Questions:

- **How would you define technological innovation?**
- What are the main innovation strategies in your tech sector?
- Walk me through the stages of development of a tech project. What problems might occur? Did the original vision come to life?
- When designing technology for the future, how far into the future do you look?
    - What role do expectations for the future of tech play in the research institutes?
    - What is the materiality of these expectations?
    - Success/failure rate of technologies?
- **What kind of societal narratives or stories or discourses have shaped the way you think about technoscientific innovation and the future?**
- **What is the relationship between tech innovation and popular narratives about the future of tech?**
- **How are investment decisions made regarding technology innovation at your organization?**
- Are there regulations/restrictions that prohibit certain kinds of technological innovation?
- What is the role of government in promoting or constraining different forms of technological innovation?
- How might innovation policies be designed to address concerns about innovative development?
- How does your tech sector differ from other hi-tech sectors?
- **What does the future of tech look like to you?**
- Are you familiar with 'hype' cycles in technological innovation? Can you tell me how hype cycles work in AI innovation? (hype/disappointment or minimize risk and emphasize positives)
- Who are some of the most important thinkers in innovative technology in your opinion?
- **Is there anything else you want to add, anything I should be asking about and am not?**
- **Can you refer others who might be interested in conversations like these?**

*Bold questions indicate primary research questions which include my primary objectives and were asked of every interviewee. Additional questions were asked based on time available.