The Myth of Techno-Transcendence: The Rhetoric of the Singularity

By

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Abstract

Recent studies suggest that people are anxious about the influence of technology on (and in) the future. The rapidity of technological progress, combined with the failure of technical discourses to provide answers in times of uncertainty have forced audiences to find alternative means of making sense of their contemporary situation.

In particular, narrative forms have become prominent resources for audience's seeking to understand the trajectory of technology and its effects on their lives. One example of the emergence of these types of discourses is the Singularity, a story about a future point where human and machine intelligence is indistinguishable and humanity has been transformed by technology.

As such, in this study, I illuminate and analyze the rhetorical form and function of both pro- and anti-Singularity discourse in an effort to understand the contemporary cultural role of stories about the future. In doing so, I argue that advocates of the Singularity employ a mythic form of reasoning, combining narrative and technical discourses while characterizing rationality in religious terms. Alternatively, critics of the Singularity warn audiences of the impending doom of artificial intelligence (and the like) through a narrative form of secondary allegorizing. Finally, I suggest that the prevalence of these competing discourses indicates a possible blurring in traditional distinctions between myth and allegory, while also highlighting the changing role of cultural and social narratives in a technological era.

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Chapter One: Technology and the Future

In February of 2011, *Jeopardy!* reunited its two greatest champions, Ken Jennings and Brad Rutter, to play against IBM's Watson, the latest iteration in game-playing machines. After two days, Jennings and Rutter had earned $24,000 and $21,600, respectively; Watson won $77,147 (Markoff, 2011). Watson's performance was an overwhelming display of "merciless efficiency-a description that seems redundant when applied to a state-of-the-art computing system" (King, 2011, para 3). Fitting, then, that Jennings answer to the "Final Jeopardy" question skirted substance in favor of praising the machine: "I, for one, welcome our new computer overlords" (Markoff, 2011, p. A1).

Responses to Watson's stint on *Jeopardy!* illustrate two important elements of public discourse about technology: inconsistent attitudes about progress and the role of popular culture as a means of forming attitudes. For example, Watson's success is heralded as a "step forward" ("Watson and," 2011, para 4) or "vindication for the academic field of artificial intelligence," (Markoff, 2011, para 14) and "a significant leap in a machine's ability to understand context in human language" (Paul, 2011, "The Takeaway").

Alternatively, Jennings response to Watson illustrates underlying social anxiety about the future of technology and its relationship to humanity. As one commentator writes of Watson's success, "the simple observation that a computer is smarter than us was met with knee-jerk cries of 'No it's not!', as if the man-made machine was a threat to our own self-worth" ("Watson and," 2011, para 5). Satell (2013a) confirms such anxiety, noting that Watson's exceptional performance in a variety of fields raises concerns that "there will be no role left for humans to play" (para 7), as intelligent machines emerge as an increasing portion of the workforce. Conversations about Watson, then, illustrate the possible existence of competing social

perspectives on technology: excitement over its possibilities and anxiety about its long-term effects.

The Public and Technology

The National Science Foundation (2012) confirms the existence of inconsistent public attitudes about science and technology. Their research suggests that nearly 87% of Americans think technology has "helped make society better" (para 6) over the last decade, and will foster "more opportunities for the next generation" (para 5). Yet, while the public is enthused by the opportunities implicit in technological progress, a majority of respondents worry that research in science and technology fails to recognize the "moral values of society" (para 10) and "makes our way of life change too fast" (para 10). The Pew Research Center (2010) reflects on these inconsistent attitudes, noting, "in the mainstream media, particularly on front pages and general interest programs, the press reflects exuberance about gadgets and a wonder about the corporations behind them, but wariness about effects on our lives" (para 15).

Additional research attempts to explain these attitudes. Lee, Scheufele, and Lewenstein (2005) argue that the lack of scientific literacy in the general public is "responsible for the public's misperceptions of science and scientists and reservations about new scientific developments" (p. 243). Given the lack of public awareness regarding science and technology, people are more likely to use "cognitive shortcuts" (Lee et al, 2005, p. 241) to make sense of innovations. Wagner, Kronberger, and Seifert (2002) explain this as the process of "collective symbolic coping" (p. 323). They contend that while experts are likely to draw on pre-existing knowledge and scientific theories, the lay public "refer[s] to the symbolic resources of everyday life and public communication" (p. 324) to make sense of unfamiliar issues in science and technology.

Often, this form of symbolic coping involves popular culture. For example, one commentator notes of Watson, it is a "question answering machine of a type of artificial intelligence researchers have struggled with for decades-a computer akin to the one on 'Star Trek' that can understand questions posed in natural language and answer them" (Markoff, 2011, A1). Similarly, IBM explains of Watson that "the goal was not to create a self-aware super computer that can run amok such as HAL 9000 from *2001: A Space Odyssey* or Skynet from *The Terminator*" (Paul, 2011, "The Takeaway"), but instead to craft a benevolent technological assistant.

These references to popular science fiction speak to an underlying logic in understanding science and technology, "an intermediate stage where the public compensates for a lack of scientific literacy by using whatever images and metaphors are at their disposal" (Wagner et al, 2002, p. 341). Here, "everyday imaginations" (p. 341) and metaphors are tantamount to "technical, scientific, and school knowledge" (p. 326), reducing ambivalence and providing frames for judgment. Some science fiction narratives, then, can play a significant role in social attitudes towards technology.

Science Fiction and Myth Systems

Rabkin (2004) identifies science fiction as an important intermediary between science/technology and public attitudes, writing, "Science fiction is quite naturally the most influential cultural system in a time like ours, in which dominant technological change constantly provokes hope, fear, guilt, and glory" (p. 462). Here, inconsistent audience attitudes are worked out through important stories, "illustrating fundamental moral dilemmas faced by individuals and communities when confronted by new and emerging technologies" (Miller and Bennett, 2008, p. 600). Telotte (1993) contends that in providing audiences with a glimpse into the "world of

tomorrow" (p. 37), much science fiction acts as a "funhouse mirror" (p. 37) for understanding future technological developments.

This suggests that certain stories go beyond mere entertainment, providing audiences with a symbolic means for understanding their experiences. One way that science fiction does this is by drawing on the forms of myth. Rowland (1990) notes, myths are narrative forms that provide transcendent answers for making sense of the unknown. Miller and Bennett (2008) argue for science fiction as this type of form, accounting for rapid technological change. While the "technical realism of many conventional forms of public engagement and technology assessment often constrains one to consider only the present, the past, and maybe the near future" (p. 601), science fiction "suggests intriguing possibilities that provide needed attention to the character, dynamics, and uncertainties of non-linear interactions" (p. 601). In this way, science fiction can serve a function of traditional myths. Here, the mythic function of science fiction allows audiences to evaluate the "territory of the future with our minds and hearts" (Brin, 2006, para 92), emphasizing shared social values as the basis for solutions to cultural crises (Rowland, 1990). The result is a narrative form mapped on top of reality that makes sense of the situation and provides direction for the audience.

If science fiction is a working tool for audiences to make sense of their technological conditions, the contemporary dominance of dystopian futuristic accounts would seem to signal significant social anxieties about technological progress. While popular science fiction of the 1960s and 1970s saw the emergence of a fictional world made better through technology, contemporary science fiction "in both literature and the cinema- is indeed dystopian" (Milner, 2012, para 15). The commercial success and cult-like status attributed to works like *The Matrix*, *Blade Runner*, and *The Terminator* series highlight the increasing prevalence of concerns

regarding technology. Or, as Milner (2012) suggests, "If dystopia has once again become fashionable in film and literature it's almost certainly because we too now have much to be warned against" (para 22).

Thus, to resolve attitudinal inconsistency regarding the future of science and technology, the public often will turn to stories that make sense of their material conditions and offer frames for explaining future developments. Yet, the contemporary prevalence of negative depictions of the future seems to crowd out the possibility of stories of technological optimism. However, a particular strain of discourse has been approached from both utopian and dystopian perspectives. The Singularity reflects both optimistic and intensely pessimistic perspectives about the future of technology.

The Singularity

The Singularity proposes a foundational transformation in the relationship between humans, technology, and the future. As Verner Vinge (1993) explains, "we are on the edge of change comparable to the rise of human life on Earth. The precise cause of this change is the imminent creation by technology of entities with greater than human intelligence" (p. 12). Borrowing a term from astrophysics that describes "the point inside a black hole where the ordinary laws of physics cease to apply" (Kushner, 2009, p. 58), Vinge dubbed this crucial moment of change, "the Singularity…a point where our old models must be discarded and a new reality rules" (p. 12). For Vinge, this "inevitable consequence of the humans' natural competitiveness" (p. 16) marks a fundamental shift in what it means to be human.

Similarly, Ray Kurzweil, a graduate of MIT, member of the Inventors of Hall of Fame, recipient of White House honors from three presidents, and winner of the National Medal of Technology (Kushner, 2009), argues that advances in technology are the cornerstone of

humanity's future. For Kurzweil, "The technology of the Singularity will provide practical and accessible means for humans to evolve into something greater, so we will no longer need to rationalize death as a primary means of giving meaning to life" (2005, p. 326). In a Singular world, "the ravages of old age and even death itself will all be things of the past" (Vance, 2010, para 4) as humans will be able to "transfer our minds to sturdier vessels such as computers and robots" (Grossman, 2011, para 33). As "nanobots spread computer intelligence beyond our planet, the universe itself will awaken as if a giant switch is finally being turned on" (Kushner, 2009, p. 60), and humans will participate in the ordering of the cosmos.

Importantly, this story is gaining material traction. The United States Federal Government supports research about the Singularity, through both material resources and policy provisions favoring entrepreneurial development (Ammori, 2011), and, in conjunction with NASA, established a Singularity Institute which hosts annual conferences encouraging interdisciplinary research (Vance, 2010). In December of 2012, Google hired Kurzweil as the Director of Engineering, tasked with building "a prodigious artificial intelligence" (Knight, 2013, para 1) that can understand natural language and "learn in a way analogous to the way the human brain is designed" (Hill, 2013, para 2). Zorpette (2008) notes of the Singularity, "a lot of smart people buy into it" (para 6) and can marshal as evidence a "drumbeat of respectful and essentially credulous articles in the science press" (para 7).

Yet, while support for the Singularity continues to grow, a faction of equally influential roboticists, technologists, and computer scientists take a very different approach. Co-founder of Microsoft, Paul Allen, and influential computer scientist, Mark Greaves, argue that Singulitarian logic relies too heavily on "unforeseeable and fundamentally unpredictable breakthroughs" (2011, para 3) in crucial technological fields. Horgan (2008) argues that past attempts at

predicting greater-than-human intelligence in machines failed miserably, suggesting that the idea of the Singularity is a fantasy. Allen and Greaves (2011) support this argument, noting that science is prone to profound paradigm shifts, forcing scientists to "reevaluate portions of what they thought they had settled" (para 6), undermining the fidelity of predictive timelines.

A separate strain of criticism challenges the desirability of the Singularity. Anissimov worries, "If we humans build a more intelligent species, might it replace us? It certainly could, and evolutionary and human history support this possibility strongly" (2010, para 5). For these critics, a Singular future is human obsolescence produced by a runaway artificial intelligence, as computers would "keep on developing until they were far more intelligent then we are" (Grossman, 2011, para 9).

Thus, discourse regarding the Singularity is illustrative of inconsistency in public discussions of technology. Given that the contemporary state of scientific and technological progress lends itself to confusion, various pockets of discourse emerge, emphasizing narrative forms and science fiction fulfilling mythic functions. In the remainder of this study, I use a case study of the Singularity to illustrate contemporary utopian and dystopian rhetoric about technology. As such, I argue that the rhetoric of Singularity advocates is defined by utopian myth. Building on Rowland's (1990) account of mythic rhetoric, I contend that Singulitarians reframe material questions of technological progress as symbolic value issues, providing audiences with a rhetorical trajectory of humanity reminiscent of optimistic science fiction accounts of the future. The result is a narrative of human evolution that culminates in a symbolic resolution to the anxieties of technological progress, the promise of transcendence and everlasting life in the merging of humans and machines. Alternatively, critics of the Singularity employ a form of secondary allegory (Milford, 2010), combining historical and narrative

examples of technology gone wrong to warn audiences of a future of destruction and encourage pessimistic attitudes towards technological progress.

To demonstrate this argument, I employ an inductive analysis (Campbell & Huxman, 2003) of the characteristics present in each of the relevant discourses. This process begins with a first sort of the texts, using broad, open-ended categories to discover the available rhetorical ingredients. Such ingredients include themes, tone, strategy, response and others. Previous research suggests that issues related to technology are often approached via myth and allegory in those cases where technocratic reason is insufficient. Therefore, these ingredients are then organized according to how they satisfy the formal and functional elements of myth and secondary allegory. Next, using audience-based data regarding public attitudes towards technology and the suggestion of leading technology critics that narrative accounts arise as a means of resolving inconsistent attitudes, I identify how these themes interact to form influential stories about technology. The goal of this application is to establish the starting points of the symbolic equation driving utopian and dystopian discourses about technology and the future.

Preview of the Study

I will develop the argument I have described in four additional chapters. In Chapter Two, "Myth, Technology, and the Future," I will first establish the elements of technocratic discourse, necessary for rational or technical approaches to technology and the future. Then, I will review the relevant literature on myth to illuminate a limited, rhetorical approach emphasizing form *and* function. Next, I will detail the changing makeup and role of allegory in contemporary public discourse. Finally, I argue for the value of certain science fiction narratives, variously acting as myth or allegory, to inform social and cultural attitudes towards technology and the future.

In Chapter Three, "The Rhetoric of the Singularity," I will first outline the rhetorical pattern of utopian discourse. Then, I will survey the Singularity's prominent texts to identify the formal and functional elements of mythic, utopian rhetoric underlying the arguments for techno-transcendence. In particular, I will suggest that much Singularitarian discourse relies on characterizing the audience's encounters with technology in cosmic terms, situating their experiences in a long, narrative trajectory of evolution ending in existential transformation.

In Chapter Four, "The Bomb, the Robot, and the Future," I will build on the contemporary literature regarding secondary allegory, illuminating the form of anti-Singularity discourse. Specifically, I will highlight the use of historical examples, dystopian science fiction narratives, and entelechial reasoning to encourage audiences to pessimistically approach technology.

Finally, in Chapter Five, "2045: A Rhetorical Odyssey," I will first summarize the study, followed by a discussion of its implications. Here, I will argue that understanding the form and function of pro- and anti-Singularity rhetoric illuminates the public's relationship to technology and the changing role of narrative in public discourse.

Chapter Two: Stories, Technology, and the Future

In an era dominated by science and technology, much research suggests that alternative systems of reasoning (i.e. myths) have lost their power to explain the human condition (Barrett, 1972; Vignoli, 1978; Barrett, 1987). At the same time, scientific and technological advances that create perceived (or real) threats to society and generate cultural anxiety obligate people to make sense of their use of technology and the future (Wagner et al 2002). In response to these concerns, three types of social discourse have developed: scientific accounts, a renewed focus on myth as an essential way of understanding the world, and allegorical narratives about the future.

In this chapter, I illustrate these types of reasoning systems. First, I describe technocratic discourse. Here, I trace the historical emergence of technical or rationalistic reason, a discourse often characterized as a corrective to myth, and identify its characteristics. Then, I examine the relevant literature on the elements of myth. Specifically, noting the variety of definitions, I suggest that a limited definition, one that emphasizes both the formal and functional components of myth (Rowland, 1990) offers the most useful approach to rhetorical criticism. Next, noting that many social and cultural stories appear mythic in form but might lack mythic function, I argue for a view of allegory as a supplement to myth, bridging the gap between mythic and secular realities. Finally, I describe a particular set of stories, science fiction, which acts as a contemporary means for making sense of technological and scientific progress in mythic terms.

Technocratic Discourse

Barrett (1987) notes that, "science and technology, have become, as we have seen, the driving forces within modern civilization" (p. xiv). Similarly, Cassirer (1970) contends, "There is no second power in our modern world which may be compared to that of scientific thought. It is held to be the summit and consummation of all our human activities, the last chapter in the

history of mankind" (p. 207). Yet, the contemporary dominance of science and technology is not a sudden manifestation. Rather, it is the culmination of nearly three and a half centuries of shifts in thinking that have made possible a technical discourse of the present.

For example, Vignoli (1978) argues that the Modern Age begins in the hands of Galileo and his successors, as "Nature was made subordinate to weight and measure, and to their mathematical and mechanical proportions in various phenomena; these were deduced from experiment and the use of instruments" (p. 235). Here, in the laboratories of the seventeenth century, scientific experimentation ushered in

> a turn in human reasons, and consequently a transformation of our human being in its deepest attitudes toward the world. *Humankind turned away from a passive, to a more active role in its struggle with nature*. Life is given to us to be mastered, not as something to drift along with. (Barrett, 1987, p. 73)

Merging with governmental and social philosophies of the centuries that followed, Barrett (1972) notes, "Science, reason, progress—these became the sacred watchwords of the *philosophes* of the Enlightenment in the eighteenth century" (p. 138). And, as these discourses became ideals for more than the mere practice of science, the technical and industrial age of the present began to take shape (Barrett, 1972).

Contemporarily, such discourse "has steadily crept into widespread use, not only in the social sciences, but also into the languages of business, government, and international policy centers" (McKenna & Graham, 2000, p. 224). In fact, so diffuse is this "technocratic discourse" (McKenna & Graham, 2000; Salvador, 1992), which draws from science, technology, and history, that Salvador (1992) concludes it is "part of the fabric of American culture" (p. 20).

Similarly, such prevalence leads Barrett (1987) to identify science and technology as "the unique and central facts of our modern age" (p. xiv).

However, as the power of science and technology grew, a separate strain of reasoning diminished. As Cassirer (1970) explains, "In the new light of science mythical perception has to fade away" (p. 77). Scholars have offered a variety of explanations for the tension between myth and science. For example, Vignoli (1978) argues that in "arriving at a rational idea of that which was originally a fantastic type by divesting it of its wrapping and symbols" (p. 194), science led to the unraveling of myth. Barrett (1972) contends that the transition from myth to science was cemented during the Enlightenment, as newfound understanding and control of the natural world led humans out of the presumed "night of prehistory: a darkness of myth, superstition, and ignorance" (p. 138). Alternatively, Doty (2004) argues that, in science, "mythic levels of understanding and expression are only levels to be gotten beyond" (p. 35) to something more pure.

Yet, as Barrett (1972) notes, while myth might lack a "meticulous fidelity to external facts" (p. 22), it accesses "a truth about man and his cosmos that may be lost under the details of documentation" (p. 22). Here, the "fragmentation of experience" (Barrett, 1972, p. 61) wrought by the dissipation of myth into purely rational ideas (Vignoli, 1978) has dissolved "the network of familiar meanings that make up our world in order to replace them by some systems of meanings of a different, and allegedly more comprehensive, order" (Barrett, 1972, p. 39). As "an exhibition of the power of the human mind, of its freedom and originality to construct concepts that are not passively found in nature" (Barrett, 1987, p. xv), science, perhaps more than any other facet of human experience, exemplifies the Protagorean maxim, humans are the measure of all things (Barrett, 1972). But, as Barrett (1972) writes,

> Man cannot find meaning in himself, not in himself alone anyway; he must feel part of something greater than himself…he must feel that he belongs to something cosmic that is not of man and not of men, and least of all man-made, but toward which in the deepest part of himself he can never feel alien. (p. 141)

Thus, to find that thing beyond the discourses of science and rationality, variously described as "the soul" (Vignoli, 1978, p. 238), or the "mystery that baffles the understanding" (Barrett, 1972, p. 141), humans frequently turn to back to the form out of which science emerged, myth.

A Definition of Myth

A survey of literature reveals a variety of perspectives that inform definitions of myth. For example, some scholars emphasize myth as a means of sense-making. Waardenburg (1980) notes, myths are "a particular form in which humans mentally digest and assimilate reality insofar as it makes itself palpable as an overpowering phenomena" (p. 58). Similarly, Doty (2004) contends that myths provide "society and its individuals with possible projected models, with creative ways of seeing the 'deep' significance of apparently insignificant events and images, and with the knowledge that ground value structures that provide foundations for a better future" (p. 30).

A separate strain of scholarship describes myth as a means of social bonding. Kelley-Romano (2006) discusses myth as "the glue of society that binds us to one another and to our traditions" (p. 385), akin to Doty's assertion that myths provide societies with cues as to which "powers (divine or otherwise) are to be respected and in which order they are to be approached" (2004, p. 23). Nelson (1989) underscores the importance of such social cohesion, concluding that myths are "symbolic stories of the whole" (p. 176) that provide communities a sense of shared order. Campbell's seminal account, *The Power of Myth* (1989), explains myth as "a field

of reference to what is absolutely transcendent" (p. 58), identifying a fundamental substance common to each member of a society.

Other scholars focus on formal elements, but tend to downplay how myths function. For example, Rushing's (1985) assessment of "E.T. as Rhetorical Transcendence" identifies archetypal symbols interacting against a fundamentally mythic backdrop, focusing on the perils of technology and the sanctity of humanity. Similarly, Rushing's work on Star Wars (1986) illustrates how an audience *could* see mythic tensions between technology and humanity, but lacks evidence that audience's treated the stories as "true" accounts of their struggles with like issues.

Definitions of myth like Rushing's can be, as Rowland (1990) notes, "critically dangerous" (p. 107), emphasizing either extremely broad notions of myth or approaches that fail to emphasize a relationship between the form and function of myth. Instead, a narrow definition synthesizing a variety of functional and formal elements serves a useful critical purpose. Rowland's (1990) limiting approach to myth, as *stories that provide symbolic solutions to social problems where rational, technical, or scientific means fail*, illuminates both the functional and formal components of myth.

The Functional Elements of Myth

A number of scholars have theorized on the functions of myth. For example, Doty (2004) contends that myths teach social attitudes by signifying and coalescing values, stories, or projections that "*have been found worthy of repetition and replication*" [emphasis in original] (p. 20). Kelley-Romano (2006) suggests that myths "explain the unexplainable and provide comfort in times of uncertainty" (p. 385). And, Vignoli (1978) argues that myths are the "psychical and

physical mode in which man projects himself into all those phenomena which he is able to apprehend and perceive" (p. 1).

Much of this theorizing draws from or contributes to Campbell's (1988) assessment that myths serve four functions. First, myths serve a mystical function, opening the world to the "dimensions of mystery, to the realization of the mystery that underlies all forms" (p. 38). Second, myths act cosmologically, "showing you what the shape of the universe is" (p. 39). Third, myths serve sociological functions, "supporting or validating a social order" (p. 39). Finally, myths are pedagogical, demonstrating how to "live a human lifetime under any circumstances" (p. 39).

Yet, as Rowland (1990) notes, "While there is disagreement over the functions served by myth, a closer look reveals that all of the functions…can be treated as part of a larger function, answering human problems that cannot be answered discursively" (p. 102). In accordance with this larger aim of myth, I suggest that myths serve two interrelated sub-functions to resolve the social or cultural crises to which Rowland refers: translating material conditions of present social or cultural crises into symbolic terms, and establishing transcendent frames for understanding human experience.

Material conditions and symbolic terms. Myths are necessary when social or cultural crises cannot be resolved by rational, technical, or scientific means. Underlying the success of the myth, however, is the audience's acceptance of the narrative as illustrative of their material conditions. For example, Rowland (1990) discusses myths as "framing stories" (p. 103). He argues that, while the events of the myth might not accurately reflect history, the story is treated as "true" in the culture in which it is told. This assessment illuminates the relationship between the material and symbolic elements of a myth. While the story might not occur in a time or place

that looks like the audience's environment, the theme of the story or the values in question are similar to contemporary cultural or social crises, relating the narrative to the audience. Thus, the details of the myth are less important than the audience's ability to see themselves in the situation. Or, as Gehmann (2003) contends, myths craft a "world 'as it is' being of relevance for us" (p. 105), while also providing a transcendent frame for understanding.

Thus, the first sub-function of myth is to bridge the gap between the audience's material conditions and the symbolic space of the narrative. To accomplish this, myths emphasize the fundamental relationships between the characters, scenes, and plots of the story and the audience's crisis. Having identified with the myth, the audience can then begin to extract from the narrative the symbolic resources it offers to overcome the problems unaccounted for by rational, technical, or scientific means.

Specifically, humans confront a variety of social and cultural crises, some of which require the use of discursive reasoning. For example, the recent spread of Avian Flu, the economic recession of 2008, and anthropogenic climate change are problems best accounted for by scientific or technical analysis. Yet, these systems of logic have their limits. While each might resolve a subset of the problems individuals and societies face, they cannot account for a variety of equally significant issues. Specifically, "Discursive reasoning cannot justify the good society, answer basic moral conflicts, or aid the individual in confronting psychological crises. There are no purely rational answers to such problems" (Rowland, 1990, p. 103). Similarly, Doty (2004) contends that recourse to natural sciences might give insight to "how" a problem arose, but it fails to interrogate what the problem signifies, how humans relate to it, and what powers/deities should be worshipped or respected in its interrogation. Thus, myth is crucial in providing meaning beyond the explanations offered by science.

For these problems, humans turn to myth. As Rowland (1990) notes, "The function of myth is to transcend ordinary life and provide meaningful grounding for that which cannot be supported rationally" (p. 103). To accomplish this, mythic reasoning describes the world in a transcendent way so that it might offer an alternative means for interpretation or judgment (Cassirer, 1970). Scholars assess mythic descriptions of the world in a number of ways. For instance, Campbell (1988) discusses "the homeland of the muses" (p. 65), where art and poetry become the languages by which audiences participate in their social structures. And Cassirer (1970) notes, "The world of myth is a dramatic world—a world of actions, of forces, of conflicting powers. In every phenomenon of nature it sees the collision of these powers" (p. 76). Implicit in each of these descriptions is a sense that purely rational discourses lack access to important realms of human experience. This is in-line with Rowland's (1990) suggestion that mythic reasoning can provide a sense of value in answering the technical problems "**not subject to rational solution**" (p. 102).

Transcendence. The final function of myth is to establish the individual's place in the universe. As Campbell (1988) suggests, "I think what we are looking for is a way of experiencing the world that will open to us the transcendent that informs it, and at the same times forms ourselves within it. That is what people want. That is what the soul asks for" (p. 61). Kelley-Romano (2006) confirms this assessment, noting that the myth's power is "in the realm of transcendent" (p. 389). This mythic function underlies the long history of storytelling as a means to "deal with the crises of life" (Rowland, 1990, p. 102). Kelley-Romano (2006) argues that this mythic function "has always been a main component of theological and mythological philosophies" (p. 388), extending at least as far back as the Greco-Roman period.

Campbell describes a "cosmological function" (1988, p. 39) that highlights a fundamental tenet of mythic reasoning: "people need to have *faith* that there is a meaning to life" (emphasis mine, Kelley-Romano, 2006, p. 389). Similarly, Cassirer (1970) discusses "an implied act of *belief*" (emphasis in original, p. 75) in mythical imagination. This explains why religious systems tend to be the most accepted myths of a society, influencing nearly every aspect of life (Kelley-Romano, 2006). In myth, which is "from its very beginning potential religion" (Cassirer, 1970, p. 87), humans *choose* to see the interconnectedness of life and the power of the universe.

In offering a rationale beyond the means of technical and scientific discourse, myth speaks to the power of stories as meaning-making devices. Additionally, the transcendent function of myth illuminates the human need to believe in "something beyond," a greater explanation or power, deity or otherwise, that weaves together the fabric of human experience. Finally, this function synthesizes the whole of myth. In setting the audience's crisis against the backdrop of a larger cosmic order, myth offers a new way of seeing the situation. And, in expanding the context of the crisis as part of an interrelated drama of the universe, myth also expands the solutions available to the audience. Perhaps this is why Doty (2004) concludes that myths are "the backbones of practical ways of living realistically" (p. 3).

The Formal Elements of Myth

Rowland (1990) notes that there are five formal components of myths. First, myths are stories, each with "a beginning, middle, and end" (Kelley-Romano, 2006, p. 386). Yet, in distinction from historical, rational, or technical accounts, mythic stories "possess a unique power to symbolically 'solve' social problems not possessed by other symbolic forms, because the rules of discursive logic do not apply" (Rowland, 1990, p. 103). For this reason, Campbell

(1988) concludes that multiple, inconsistent versions of the same myth might exist, or that myths might even be self-contradictory, but remain true for particular audiences.

Second, the main characters in a myth "**must** be heroic" (Rowland, 1990, p. 104). Rushing (1985) highlights the importance of this element, writing, "the central rhetorical symbol in a myth is generally a cultural hero" (p. 192). Typically, the hero journeys into an alternative realm, is "tested by a monster or villain" (Rushing, 1985, p. 192) and returns transformed (Campbell, 1988). Average characters lack the necessary courage to brave uncharted and new territory and, as such, the hero's evolution brings the rest of the social group into maturity (Campbell, 1988; Rushing, 1985). And, as Rowland (1990) notes, the greater the social problem, the greater the heroism required of the protagonist.

The third and fourth formal elements of myth relate to the time and place of the story. Temporally, myths exist either in a special time, set aside from "normal historical time" (Rowland, 1990, p. 104), or in a period considered mythic because of its significant, symbolic meaning. Mason (1980) notes that, in myths, "time accelerates and slows, condenses and elongates" (p. 16). Procter (1992) justifies such a treatment of chronology, arguing that in bending time myths are capable of mixing past and future, allowing rhetors to regenerate stories from another time and graft them over contemporary issues (Procter, 1992). Additionally, myths exist in a special place, "outside of the normal world or in a real place possessing special symbolic power" (Rowland, 1990, p. 104), places that are often sacred.

Finally, myths rely heavily on archetypal language. Here, enduring symbols like blood and water (Rowland, 1990), prevalent throughout many myths, represent fundamental elements of life that transcend cultural boundaries. As Rowland observes, "because archetypes function as

the most powerful symbols in a society it makes sense that they would be present in myth" (1990, p. 104).

Thus, as Campbell (1988) notes, myths provide "a way of experiencing the world that will open to us the transcendent that informs it, and at the same times forms ourselves within it. That is what people want. That is what the soul asks for" (p. 61). Here, myths speak to a deeper meaning of humanity and the universe, one that transcends the cultural, social, or temporal settings that define contemporary situations (Kelly-Romano, 2006). The result is a set of similar formal elements appearing across various cultures and times, a combination that speaks more generally to the human condition (Campbell, 1988).

Through this definition of mythic form, I hope to illustrate the elements that build a mythic narrative. The formal elements in combination allow myths to perform functions for which other forms are inadequate. Waardenburg (1980) notes,

> Each element of the myth has to some extent a symbolic connotation, and the combination of these elements confers a new symbolic meaning of its own, for the plot itself unfolded in the story refers to a reality or truth which is represented as an event of great consequences and implications. These symbolizations together indicate the meaning of the myth, which in most cases is proclaimed to be a truth upon which the ordinary world and immediate reality or parts of it are based, so that through the myth, world and life can be seen in their real nature. (p. 53)

Myths, then, combine a variety of formal elements to reveal the "true" nature of reality that exists transcendentally in the space of the narrative.

As stories for living, those narrative forms that achieve mythic status must change with the times to account for evolving material conditions (Procter, 1992). However, Campbell

(1988) laments the fact that the contemporary pace of technological progress makes life change so rapidly that myths cannot weave together the social fabric as they once did. Yet, Wagner et al (2002) contend that "people are under pressure" (p. 338) to come to terms with the rapidity of scientific and technological change, justifying the use of collective symbolic coping mechanisms (i.e. myth). Phair (2010) offers a possible solution for this problem, arguing that allegory can act as a bridge, reconciling the tensions between myth(s) and secular reality, while still offering the audience symbolic solutions to social and cultural crises. As such, in the next section, I lay out a theory of allegory that emphasizes its ability to function in ways similar to myth while also accounting for the types of challenges posed to narrative systems of reasoning in an increasingly technical world.

Allegory

Research illuminates two dominant and competing interpretations of allegory (Milford & Rowland, 2012; Milford, 2010; Phair, 2010). Broadly identified as traditional and postmodern approaches to allegory, a variety of theorists have engaged the form and function of this strategy. In this section, and building on contemporary works that describe a version of allegory that emphasizes functional rather than formal elements (Milford & Rowland, 2012; Phair, 2010), I argue that allegory is one way audiences symbolically extract (Milford, 2010) ideological or mythical meaning from narrative, many of which have the form of myth but that are not seen as true stories. I suggest that this type of allegory, which *draws from* but is not *beholden to* ideological or sacred pretexts, acts as a supplement to those discourses exhibiting both the form and the believed-as-true (Rowland, 1990) character of myth. To illustrate this argument, I first define traditional and postmodern approaches to allegory, then identify a situated version of

allegory, secondary allegory (Milford, 2010), and explain how it acts as an effective, symbolic sense-making tool.

Traditional Allegory

Traditional interpretations of allegory emphasize a close relationship between the surface narrative and the underlying referent, such that the audience is guided towards the intended meaning. As Milford (2010) notes, "Classically allegory was defined as a message in which a text serves as a vehicle for a fixed ideological message informed by a pretext" (p. 18). Here, the success of the allegory relies on two key elements. The first is the existence of a pretext, "which comes before the text, usually a myth or ideological narrative" (Milford & Rowland, 2012, p. 537) that "(p)reaches through the surface narrative producing a deeper level of consideration" (p. 538) and meaning. Phair (2010) clarifies the importance of meaning added by the pretext, arguing, "Generally, this meaning is seen as something that is transcendent and connected to ideological convictions, religion being the most common example" (p. 108).

Yet, the mere existence of a pretext does not guarantee that the audience will read the narrative for its intended purpose. For instance, Fletcher (2006) describes the allegory and its pretext as existing on either side of a "hermeneutical wall" (p. 78). For the allegory to work, each side must be "cognizant of the other's activity" (p. 78). Thus, the second element of successful allegory is the audience's ability to engage the narrative while recognizing and making use of the ideological, mythic, or sacred pretext. Bruns (1988) discusses this as the need to read the text "in the right spirit" (p. 385), requiring the audience to embrace the transcendent, "spiritual sense" (p. 385) beyond the surface of the narrative. Milford and Rowland (2012) underscore the importance of this element, writing that, "An audience that lacks the pretext will not understand the allegory and an audience loyal to the pretext will reject any treatment that

does not reinforce the underlying myth or ideology" (p. 538). Thus, traditional interpretations of allegory treat it as a "focusing lens" (Milford, 2010, p. 18), illuminating the narrative through the symbolic pretext.

Postmodern Allegory

While traditional allegory focuses the audience's attention on "a hidden meaning intentionally placed in the text by the allegorist" (Phair, 2010, p. 108), postmodern allegory expands the scope of potential meanings. As Milford (2010) notes, "the postmodern approach views the text as a collage of images designed to promote a diversity of conclusions" (p. 18). At the heart of the distinction between traditional and postmodern approaches are the role of the pretext and the means of interpretation. Milford and Rowland (2012) argue that, "Where the traditional allegory relies on the audience's knowledge of a pre-existing myth or ideology to reinforce a particular interpretation postmodern allegory relies on polyvalent symbols, that possess multiple meanings…to support a number of potential interpretations" (p. 538). However, the lack of a direct referent necessarily changes the way the audience understands the surface material. Specifically, "By using a pastiche of images, the rhetor is able to greatly expand the frame of reference" (Milford, 2010, p. 22) and, "As a result, allegory becomes less about a *connection* between the ideological pretext and the text, and more about providing a *direction* that allows the audience to see whatever they choose" (p. 22).

Thus, traditional and postmodern approaches to allegory differ: one emphasizes a close relationship between the text and its intended ideological, mythic, or sacred pretext, the other cobbles together a variety of possible symbolic relationships, allowing the audience to choose their own allegorical adventure. Yet, while they appear contrasting in nature, Milford (2010) argues for a view of allegory that would treat the traditional and postmodern interpretations as

complementary. He suggests, "the most appropriate means of testing traditional allegory in contemporary culture is not an analysis of the text but with a thorough consideration of secondary texts discussing the original allegory" (p. 19). Here, the "allegory occurs when an audience appropriates a text that is structurally a postmodern allegory and interprets it in a traditional fashion, imbuing it with ideological power via a pretext" (p. 20).

Secondary allegory. The notion of "secondary allegory," which has the audience extract ideological meaning from a text and frame it around a not necessarily sacred pretext seems useful. For example, Hariman (2002) calls for an understanding of allegory as equipment for "people to make sense of their lives in a period of accelerated cultural change characterized by pluralism, fragmentation, and inevitably provisional forms of community" (p. 288). Here, the use of secondary allegory allows the allegorist to take parts of mythic systems and sprinkle them in among new cultural stories such that the ideological pretext remains, if slightly modified in its interpretation by the changing cultural landscape. In this sense, secondary allegory can function as a supplement to myth. While many stories might appear mythic in form, they might lack a believed-to-be-true quality because of the audience's inability to reconcile the material conditions of the present with the symbolic elements of the narrative. A particular set of stories, science fiction, emphasizes mythic elements with "heavy doses of allegorical writing" (Hariman, 2002, p. 271).

Doll and Faller (1986) note, "Science fiction reflects a fear of life in the future, particularly a fear that we are destroying ourselves through science and technology" (p. 92). While this form is often overtly "mythic literature with potently political implications" (Nelson, 1989, p. 176), the audience may not believe it to be true in the same way a religious audience might embrace their sacred texts. Thus, in the next section, I describe a version of science fiction

that exhibits formal mythic qualities, while functioning allegorically, allowing audiences to extract symbolic elements from a variety of narratives, crafting a more comprehensive approach to science and technology.

Science Fiction as Symbolic Form

In *Profiles of the Future* (1964), Arthur C. Clarke mused, "It is impossible to predict the future and all attempts to do so in any detail appear ludicrous within a very few years" (xi). There is, however, hope for those few versed in the language of prediction. He writes, "I do not for a moment suggest that more than 1 percent of science fiction readers would be effective prophets; but I do suggest that almost 100 percent of reliable prophets would be science fiction readers—or writers" (xiii). In this section, and building on Clarke's assessment, I argue that science fiction can make sense of social or cultural crises regarding technology through narratives of the future. It is important to recognize that it is beyond the scope of this study to assess the entire science fiction genre. With a nearly innumerable number of texts, and an equally daunting number of generic definitions, I have chosen to limit this analysis to science fiction narratives concerned with technological advances, especially a future in which computers become self-aware.

Milner (2010) notes that, as a genre, science fiction developed in "nineteenth-century Europe through a radical redistribution of interests towards science and technology" (p. 157). As such, a working definition of science fiction sees the genre as "the branch of fantastic literature that claims plausibility against a background of science" (Rabkin, 2004, p. 459). Central to this definition, and perhaps more generally the endurance and function of science fiction, is narrative. As Miller and Bennett (2008) argue, the power of the genre to "shape the public imagination of science and technology derives fundamentally from its form of narrative story-telling" (p. 600),

which "departs markedly from the forms of technical rationality common to more classic approaches to thinking longer term about technology" (p. 600).

Two qualities exist in those stories that function to resolve technological anxiety. First, the drama is set in the future and in a world made different through technology (Doll & Faller, 1986). Such a setting underscores "one of the abiding themes of science fiction, the utopian effort to design a different and, one hopes, better worlds" (Telotte, 1993, p. 29). For example, the *Star Trek* universe is set in a future time where "technological innovation has effectively solved the practical problems confounding humanity" (Milner, 2012, para 9), and "poverty, inequality and social conflict have been eliminated, so that both genders, all races and various sexualities are equal" (para 11). In this world, "people travel the galaxy in star-ships, their food and drink supplied by replicators, their fantasies enacted out and fulfilled in holodecks" (para 10). Here, the setting of the drama is kept at a distance far enough from the audience to seem "fantastic, unbelievable and unrealistic or—according to taste—marvellous [sic] and wonderful" (Milner, 2010, p. 166). The audience, awed by the utopian-like future of their world, is expected to conclude that technology is a harbinger of prosperity.

Similarly, much of Isaac Asimov's work approaches technology from an optimistic perspective. In *The Caves of Steel* (1991), the first of Asimov's famed "Robot Trilogy," Earth has been drastically altered by scientific and technological innovation. Cities do not exist as they once did, now merged by large domes that cross state lines. Humans have been stratified, and their social locations marked by their relationship to technology. Most live under the domes alongside robots, clunky machines with only faint simulations of humanness. Some, however, live in smaller colonies on other planets. This elite class, "Spacers," live extended, comfortable lives with advanced technology and robots that are indistinguishable from humans. In Asimov's

universe, as is true of much classic science fiction, there can be harmony in an unfamiliar world of advanced technology.

Yet, anxieties regarding science and technology have also led to pessimistic accounts of the future. These dystopian stories often invoke "a basic paradox: the omnipotence of human science and the fragility of human society" (Doll & Faller, 1986, p. 92), and reflect a fear that "we are destroying ourselves through science and technology" (p. 92). Cyberpunk is the one of the most recent iterations of these dystopian themes. Its modifications to the science fiction genre, generally, illustrate how modern audiences use the form to make sense of "too rapid technological progress" (Doll & Faller, 1986, p. 98). For example, Renegar and Dionisopoulos (2011) note that while much science fiction used to take place hundreds (if not thousands) of years in the future and potentially on distant planets, the modern proliferation of dystopian texts, characterized by the cyber-punk aesthetic of the 1980s, has ushered in a wave of stories set in the "not-too-distant-future" (p. 324). In the dystopian worlds of cyberpunk science fiction, "The technology and artifacts of the present are evolved and imagined as part of the future, resulting in a world that is simultaneously familiar and strange" (Renegar & Dionisopoulos, 2011, p. 324). Sponsler (1992) echoes this description, writing, "cyberpunk typically presents a montage of surface images, cultural artifacts, and decentered subjects moving through a shattered, affectless landscape" (p. 627).

Rushing and Frentz (1989) note, much dystopian discourse confronts a future of "increasing mechanization of the human and humanization of the machine, a process moving toward an ultimate end in which the machine is god and the human is reduced either to slavery or obsolescence" (p. 62). Similarly, Doll and Faller (1986) contend that a tenet of this science

fiction type emphasizes the societal fears of over-dependence on machines, and a loss of identity as the lines between "the natural and the artificial are obliterated" (p. 94).

These themes are prevalent in many modern science fiction classics, especially in works translated onto film. For example, *The Terminator* (1984) provides glimpses of a future of war, where a "landscape of discarded metal and human bones is all there is" (Rushing & Frentz, 1989, p. 71). The setting, only 45 years removed from the present, implicates a future of ultra-intelligent technology as a world of conflict, drastically different from the utopian ends offered in previous iterations of the genre. Much of Philip K. Dick's work, which has found unprecedented posthumous traction in popular culture, engages the problems of scientific and technological innovation. In *Do Androids Dream of Electric Sheep* (1968), the basis for *Blade Runner* (1982) and one of Dick's most prominent works, the drama occurs in a post-apocalyptic 1992. Set only 24 years after its publication date, the Earth is in some ways similar to that era. Social structure, class division, and religion remain. Yet, its inhabitants seem vastly different. The population now worships electric animals, and is interspersed with human-like androids, some with homicidal tendencies.

Thus, implicit in the utopian and dystopian sub-genres of science fiction is a difference in attitude. While a great deal of science fiction presents a broadly positive view of the problem of the human relationship to science and technology, its distance from the present is noteworthy. Some science fiction tends to approach science and technology from a long-term perspective, asking audiences to imagine a world in which periods of social and scientific change have led to fantastic technologies and improved lives. Other science fiction, typified by the cyberpunk aesthetic, suggests that technological innovation leads to a dystopian future. The popularity of this genre indicates anxiety about the future of modern society.

The second quality of this particular type of science fiction regards its function. Burke (1973) notes that certain stories act as more than mere fiction, offering audiences "*strategies* for dealing with *situations*" (p. 296). In keeping with this assessment, I argue that those science fiction texts that resolve technological anxiety function as "*equipment for living*" (p. 304) in a world of scientific and technological change.

Isaac Asimov's work illustrates this point. In the introduction to *The Caves of Steel* (1991), Asimov notes that in the wake of World War I, "it became very common in the 1920s and 1930s, to picture robots as dangerous devices that invariably destroyed their creators" (p. vii). Yet, he saw this as the incorrect response to science and technology. He continues,

> I could not bring myself to believe that if knowledge presented danger, the solution was ignorance. To me, it always seemed that the solution had to be wisdom. You did not refuse to look at danger, rather you learned how to handle it safely. (p. viii)

As such, he set out to tell a sympathetic tale of robots, one that articulated how humans and technology might peacefully co-exist.

In an introduction to Robert A. Heinlein's *For Us, the Living* (2004), a posthumous publication described by some critics as Heinlein's "first novel" (xi), Spider Robinson argues that Heinlein's motive was to disguise "a series of lectures as fiction" (p. xiii). As Heinlein's ideas were "wildly ahead of their time, radical, and opposed by powerful societal institutions" (p. xiii) in 1939, they fell flat as academic lectures. However, Heinlein noticed that the fiction he laced throughout the essays, often merely attempts at garnering the audience's interest, was gaining attention. And so, in that realization, he turned to storytelling that could "still end up putting across every insight and opinion he felt the world needed to hear" (p. xv). Rushing and

Frentz (1989) echo this sentiment, arguing that, "the most profound insights into how technology is and might be experienced by the culture as a whole often emanate from the literary and cinematic genre of science fiction" (p. 61).

In an epilogue to *2001: A Space Odyssey* (1982), Arthur C. Clarke discusses the political function of science fiction. After seeing some of the imaginings of *2001* come to fruition in both the Apollo and Voyager missions of the 1970s, Clarke pondered the relationship between science fiction authors and the engineers of the future. He notes, "Science fiction writers very seldom attempt to predict *the* future; indeed, as Ray Bradbury put it so well, they more often try to *prevent* it" (p. 225). Nelson (1989) confirms this corrective function of science fiction, writing, "The challenge is not to enter an early judgment, so that the prophet can later say: I told you so" (p. 182). Instead, he argues that the purpose of science fiction is "to proceive [sic] the possibility so repugnantly that it will not occur at all, or at least that it will not occur as awfully and enduringly as it might otherwise" (p. 182).

Renegar and Dionisopoulos (2011) argue that these suggestive or corrective motives are accomplished by providing "enough critical distance from the present to invite self-reflection" (p. 336). Telotte (1993) contends that these fictive portrayals are uniquely important because of "how lightly we often take the very elements—science and technology—that can work such transformations" (p. 38). In imagining the manifestation of the audience's decisions and actions, science fiction exposes the underlying assumptions and implications (Renegar & Dionisopoulos, 2011), creating "a kind of double vision: exploiting the attractions of the technological while also questioning its effects on humanity" (Telotte, 1993, p. 28).

Thus, some science fiction exhibits the formal elements of myth while functioning allegorically for the audience. In doing so, these stories allow the audience to extract narrative

elements and treat them as symbolic resources for resolving social or cultural crises. Unlike traditional myths, science fiction is not believed as true. Rather, audiences often treat the narrative as a secondary allegory, drawing meaning from it, informing social or cultural discourses that confront the benefits and perils of technology.

Conclusion

The scientific discourse established in the seventeenth century, articulated in the Enlightenment, and manifest in contemporary conversations about the future of technology are inadequate in providing meaning for certain audiences as they confront uncertainty related to science and technology. Much Golden Age science fiction told stories of progress through technology, stories that were thematically consistent with the technocratic discourse. Yet, failures of technology inevitably created anxiety leading to an alternative, more negative approach, as a form of secondary allegorizing. Here, some science fiction possessing the form of myth provides audiences with a symbolic means for understanding their place in the universe against the backdrop of rapid technological progress. These dystopian narratives provide an altogether different vision than the Golden Age stories. Building on these ideas, in the next chapter, I analyze discourse of the Singularity.

Chapter Three: The Rhetoric of the Singularity

Americans are anxious about the future. Dystopian themes, common in contemporary popular culture accounts of science, attempt to caution audiences against the ubiquity of technology. Similarly, and more generally, public attitudes towards the future are bleak. The Associated Press-NORC Center for Public Affairs Research recently published a poll suggesting that 54% of Americans think life will be worse in 2050, with a number of respondents citing technology as a reason for such decline (Associated Press, 2014).

Yet, despite the prevalence of anti-technology sentiments, a particular strain of optimistic discourse resonates with a growing sub-culture (Grossman, 2011). The Singularity, "a threshold of time at which AIs that are at least as smart as humans, and/or augmented human intelligence, radically remake civilization" (Miller, 2012, p. x), has become a guiding term under which influential entrepreneurs, organizations, and governmental agencies are marshaling substantial resources to promote the future of humanity. Leading technologists Ray Kurzweil and Peter Diamandis, and Google CEO Larry Page are just a few of the growing number of Singularitarians, people who believe in "the power of technology to shape history" (Grossman, 2011, p. 3) and the fallibility of "[b]iological boundaries that most people think of as permanent and inevitable" (p. 3).

This type of discourse, however, which suggests "that out of a fundamentally imperfect situation a perfect one may be brought forth, provided the vision of perfection can be made to prevail" (Molnar, 1967, p. 5), is not unique to the Singularity. In fact, much research confirms the long tradition of utopian rhetoric in confronting "the sharpest anguish of an age" (Manuel, 1965, p. 294). And, as anxiety over rapid technological progress has intensified, technological

utopianism, which envisions a future made perfect through technology, has become the contemporary manifestation of such discourse (Braine, 1994).

Through this lens, much of the Singularitarian rhetoric comes into focus. One example is Moravec's (1988) vision of a future where "Our culture will then be able to evolve independently of human biology and its limitations, passing instead directly from generation to generation of ever more capable intelligent machinery" (p. 4). Another is Vinge's (1993) suggestion that "Immortality (or at least a lifetime as long as we can make the universe survive would be achievable)" (p. 19). Each of these views reflects the optimism inspired by the Singularity, which is perhaps best summed up in Miller's (2012) claim that technology could "probably bring us utopia" (p. xvii). Here, Singularitarian rhetoric mirrors traditional utopian discourse, with technology as the cure for all ills.

Thus, in the remainder of this chapter, I build an argument about the appeal of this type of discourse, identifying those elements that cause the Singularitarian perspective to resonate with a growing audience. To accomplish this, I first lay out the characteristics of utopian rhetoric, with emphasis on the contemporary, technological utopia. Then, I apply those characteristics to Singularitarian discourse, illuminating the underlying rhetorical patterns that build a mythic, utopian vision of the future.

Utopian Discourse

Molnar (1967), commenting on the prevalence of utopia, writes, "The utopian tendency in man's mind is very strong and appears in almost every age" (p. 3). The continued appearance of this type of discourse suggests two things. First, it speaks to the recurrence of similar conditions that would make utopian rhetoric necessary. Second, it implies that utopian discourse can be a powerful means for resolving such conditions; else individuals would likely find an

alternative. In this section, I examine existing scholarship on utopia to determine the types of exigencies to which utopian discourse responds and the underlying elements that make up that response. In doing so, I argue that one function of contemporary examples of this discourse is to resolve cultural angst regarding science and technology.

The Rise of Utopian Discourse

Utopian discourse tends to thrive in times of social anxiety. As Molnar (1967) suggests, utopian rhetoric often confronts "generally unsettled conditions" (p. 4) and "insecurity and suffering" (p. 4). Here, utopia functions as a cultural dream, envisioning a space cleansed of social anxiety (Manuel, 1965). Generally, such anxiety speaks to the existence of an imperfection, or "the very presence of evil in the world [which] constitutes the most general incentive for contemplating new systems from which evil would excluded" (Molnar, 1967, p. 4). In this vein, Kateb (1965) concludes that the correct definition of utopia is the absence of radical evil.

The utopian seeks to purge social ills. The "desire for absolute purity" (Molnar, 1967, p. 22) and a "society in which radical evil has been abolished *and* human wants are satisfied to the fullest degree possible" (Kateb, 1965, p. 457) serve as the utopian's main motivations. Often, the manifestations of these dreams are described in terms of leisure and abundance (Molnar, 1967), suggesting that utopian visions are unencumbered by the material conditions of the present. However, to convince others of both the fallibility and perfectibility of the current social order, the utopian rhetor must offer more than an idealized vision of the future.

The Characteristics of Utopian Discourse

Portolano (2012) broadly defines utopian rhetoric as:

> [t]he use of symbolic communication in an attempt to move the actual state of affairs into alignment with an imagined, better state of affairs—that is, a utopia, either one shared by the community or one invented by the speaker or both. (p. 116)

To achieve such an ideal state of affairs, effective utopian discourse contains three elements (Molnar, 1967). First, the utopian thinker must identify the conditions (material, ideological, or otherwise), which have prevented humans from achieving a state of purity or perfection. Second, utopian discourse should illustrate the means of transcending such imperfection. Finally, the utopian rhetor must present a vision that satisfies the audience's needs by resolving social anxiety.

First, utopians need to identify the barriers to perfection. Here, the utopian seeks to characterize the status quo in negative terms, highlighting deficiencies in social, economic, and political structures as evidence of unfulfilled individual or communal potential. For example, by indicting class structure as the underlying cause for inequality, the Marxist narrative identifies a barrier to individual growth and social harmony. Similarly, the Christian myth rests on a division between Heaven (utopia) and Earth (material reality) that begins with sin and manifests in The Fall. The premise, then, is that human nature is an impediment to transcendence, indicating the barrier to be overcome. And, in indicating the cause of imperfection, the utopian implicitly suggests the trajectory of the ideal, desired future. As Sargent (1994) notes, "If we are hungry, we dream of a full stomach. If we are sexually frustrated, we dream of sexual fulfillment. If we are frustrated by something in our society, we dream of a society in which it is corrected" (p. 3).

Second, having identified the barriers to an ideal state and broadly defining the vision, the utopian must explain the means for transcending such imperfection. In this element of utopian discourse, the rhetor demonstrates to the audience that despite the prevalence of imperfection, all hope is not lost. Instead, by changing their current ideological or material practices, the audience might productively confront the problems of the status quo. Here, the utopian suggests, "we have returned to the threshold of a new paradise" (Molnar, 1967, p. 16), and that the means for reaching an ideal state are accessible. As Levitas (2007) notes, "The advantage of utopian thinking is that it enables us to think about where we want to go, and how to get there from here" (p. 300).

Finally, the rhetor must gain the audience's immediate adherence to a trajectory that would achieve utopia. As Molnar (1967) argues, "the utopian is convinced that, once we acknowledge the desirability of an ideal state of affairs, we must immediately proceed to bring it about" (p. 43). Of significance, here, is the dual strategy of both justifying the specific trajectory and the utopian as leader. Accepting that society is encumbered by conditions preventing perfection and that there are means for overcoming such impediments does not implicitly justify the utopian or their solutions. It merely suggests that certain things should and can change. Thus, the rhetor encourages the audience to act swiftly and decisively to avoid entrenching the problem. Here, the utopian's strategy is to explain how "a single regeneration, putting an end to history […] and ushering in a kind of timeless time" (Molnar, 1967, p. 14) could occur.

For example, adhering to the Marxist vision of utopia implies both accepting that the capitalist mode is flawed *and* rejecting alternatives to Marxism as a corrective. Similarly, many systems of belief identify the fallibility of human nature as a barrier to higher forms of existence, but the Christian vision suggests a particular path to transcendence that limits the availability of

other ideologies and gods. The utopian, then, seeks to justify their trajectory towards perfection, despite the existence of alternatives, as the necessary path for salvation.

In summary, utopian discourse relies on three interrelated themes, requiring the rhetor to identify the present conditions undermining individual and social harmony, propose the means for overcoming such barriers, and characterize their vision as the most likely avenue for success. A particular, contemporary iteration of utopian thinking enacts this symbolic form.

Technological Utopianism

Braine (1994) notes, the rapid technological innovations that have taken place since the 1950s have intensified social and cultural ambivalence about science. Accordingly, many visions of a future accounting for technology have been expressly dystopian (Pierce, 1965). On the other hand, utopian thinkers have attempted to resolve uncertainty about scientific invention by arguing for technology's ability to lead society out of such peril. This strain of discourse, known as technological utopianism (or techno-utopianism) suggests that the path to perfection has become clearer and more attainable because of science (Molnar, 1967).

Utopian discourse can be an effective means for overcoming shared cultural or social anxieties, providing audiences with a vision of the future rid of (and often made better by) the subject of their angst. However, the success of such discourse relies on the utopian rhetor's ability to convince others of the desirability and possibility of perfection. As a contemporary manifestation of this type of thinking, technological utopianism suggests that technology is the cure for many of humanity's ills, and has elicited both staunch adherence and vocal opposition.

In the next section, I analyze a particular strain of technological utopianism, the Singularity, to identify the underlying rhetorical elements of utopian discourse. First, I describe how Singularitarians discuss barriers to techno-transcendence. Then, I illuminate the

Singularitarian means of transcendence, those strategies available to the audience that can be used to achieve utopia. Finally, I articulate the Singularitarian argument for adherence, explaining how these rhetors encourage audiences to consider and embrace their position. Prior to that three-part analysis, I describe the Singularitarian utopia.

The Singularity as a Techno-Utopia

Advocates of the Singularity articulate a utopian vision of the future. For example, Kurzweil (2005) suggests that, "The Singularity will allow us to transcend [the] limitations of our biological bodies and brains. We will gain power over our fates. Our mortality will be in our own hands. We will be able to live as long as we want" (p. 9). Tiku (2012) explains some of the means by which technological progress could achieve such utopian ends, writing, "If we *are* able to develop a 'friendly' superhuman intelligence, then it could do everything from curing cancer to accelerating scientific research to eradicating hunger" (para 16). And Vinge (1993), emphasizing the potential abundance offered by technology and typical of utopian discourse, notes,

> Suppose we could tailor the Singularity. Suppose we could attain our most extravagant hopes. What then would we ask for: That humans themselves would become their own successors, that whatever injustice occurs would be tempered by our knowledge of our roots. For those who remained unaltered [by technological enhancement], the goal would be benign treatment (perhaps even giving the stay-behinds the appearance of being masters of godlike slaves). It could be a golden age that also involved progress. (p. 19)

Singularitarian rhetoric, then, offers a vision of techno-utopia: a world of limitless possibilities, material abundance, and near immortality through technological progress. And, for many of

these rhetors, the first element in getting audiences to embrace this trajectory is to effectively describe the obstacles to transcendence in the present system.

Barriers to the Singularity

Singularitarians' offer a number of timelines for the threshold of ultra-intelligence. Miller (2012) notes these discrepant trajectories, observing that Singularitarians variously identify 2025, 2030, 2045, or 2080 as possible dates for the event. Chalmers (2010) notes that such variety speaks to the history of predictions regarding artificial intelligence, writing, "The history of AI involves a long series of optimistic predictions by those who pioneer a method, followed by periods of disappointment and reassessment" (p. 11). Such variety in these forecasts might be accounted for by the vast array of possible obstructions on the path to techno-transcendence. In this section, I illuminate the substance of these barriers. I then turn to the discourse of Singularitarians to illuminate how such barriers are overcome to craft the foundations of their techno-utopian narrative.

Material Barriers

Much research suggests that achieving the Singularity is primarily constrained by material issues. A survey of relevant literature illuminates two types of barriers, including deficiencies in the current state of technology and the limits of human intelligence.

The current state of technology. A primary explanation for the variance in estimated dates for the Singularity is the current state of research on the brain. Specifically, much of the Singularitarian trajectory relies on groundbreaking advances in the means by which machines process information. For example, modern computers hold at least two distinct advantages over the human brain. First, they can store a significantly larger amount of data. Second, they can resolve data-based queries (equations, key-word searches, etc.) at a much more rapid rate.

However, machines still lack a system for the types of information-association techniques endemic to the mind. As Saenz (2010a) laments, scientists continue to struggle with the complexities of the human brain, undermining attempts to model the mind and, subsequently, engineer machines capable of employing its processes. Chalmers (2010) similarly describes this problem, arguing, "the most important remaining form of resistance [to the Singularity] is the claim that the brain is not a mechanical system at all, or at least that the nonmechanical [sic] processes play a role in its functioning that cannot be emulated" (p. 9). A significant barrier, then, to ultra-intelligent technology is the contemporary understanding of the brain.

A second constraint on the feasibility of the Singularity is the current, limited processing capacity of computers. In fact, much research concludes that even if scientists were to reverse-engineer the brain and create a working model, the required processing power for such a machine is likely impossible. As Wolchover (2012) notes, "some scientists say that computing power is approaching its zenith" (para 12), making future extrapolations for Singularity-level processing capabilities seem improbable. Paul (2013) confirms this assessment, writing, "Chips may be getting smaller, but huge gains in processing power aren't making the same jumps over that time we saw in previous decades" (para 8). These comments reflect a growing sentiment in scientific and technological communities that Moore's Law, the principle that suggests the "doubling of computing power every two years" (Wolchover, 2012, para 6) is reaching its limit. In that event, engineers and manufacturers will be forced to find alternative means of generating processing power, few of which currently exist.

Thus, material barriers seem to deny the possibility of the Singularity. Both the inability to produce mind-like processes in machines and the lack of hardware capable of implementing such processes interrupt the techno-transcendence trajectory. A separate strain of discourse

emphasizes the feasibility of the Singularity, but contends that the primary obstacle to achieving it is the limit of human intelligence.

The limits of human intelligence. A major barrier to ultra-intelligence is the current, limited capability of scientists, technologists, and engineers to create the programs necessary for its manifestation. Anissimov (2010) describes this as the "Microsoft Windows objection" (para 3) to the Singularity, noting that, "operating systems are plagued by a huge number of programmers without any coherent theory that they can really agree on" (para 4). Similarly, Chalmers (2010) notes, "the biggest bottleneck on the path to AI is software, not hardware: we have to find the right algorithms, and no-one has come close to finding them yet" (p. 6). Here, techno-transcendence is jeopardized by incoherence in relevant fields and a general inability to perfect the necessary software.

Miller (2012) identifies a, perhaps, more fundamental issue regarding the limits of human intelligence: the scarcity of groundbreaking genius. Using famed scientist John von Neumann as a litmus test, he concludes, "minds like his probably don't come about more than once in every billion or so natural births" (p. 95). For Miller, the lack of von Neumann- and Einstein-level intellects, paradigm-shifting scientists who altered the future of various disciplines, makes it difficult to both generate ultra-intelligent machines and to articulate their trajectories.

Therefore, while human intelligence serves as the foundation for the Singularity, its contemporary, limited state acts as a barrier. Deficiencies in computer programs and the lack of genius reduce the likelihood of achieving the Singularity in the near term. Yet, for Singularitarians, these substantive concerns serve as opportunities to achieve transcendence, looking past the material conditions of the present in favor of a perfected vision of the future.

Thus, in the next section, I illuminate the ways that Singularitarians rhetorically construct such barriers as the foundation of their utopian narrative.

Barriers as Blindness

A cornerstone of utopian discourse is the characterization of barriers as both significant enough to have obstructed transcendence in the past but also manageable enough to allow perfection in the future. For Singularitarians this is particularly difficult. First, they must acknowledge the contemporary limits on science and technology as potential limits on their vision. For example, Kurzweil (2005) notes, "from our *currently* limited framework, this imminent event appears to be an acute and abrupt break in the continuity of progress" (p. 24). The implication is two-fold: the history of science and technology does not suggest the type of advancement necessary for techno-transcendence nor does the contemporary state of such fields allow it.

Singularitarian discourse then relies on characterizing such barriers as indictments of contemporary perspectives on science and technology, justifying a Singularitarian view of reality. For example, also implicit in Kurzweil's remarks is that such a limited capacity is only *current* and does not reflect the tools and technology of the future. He continues, "I emphasize the word 'currently' because one of the salient implications of the Singularity will be a change in the nature of our ability to understand" (p. 24). For Singularitarians, then, the material limits of the present are not the barriers to utopia; they are instead evidence for and reflective of the real obstruction: scientific pessimism. As Kurzweil (2005) writes,

> Many scientists and engineers have what I call "scientist's pessimism." Often, they are so immersed in the difficulties and intricate details of a contemporary challenge that they fail to appreciate the ultimate long-term implications of their

> own work, and the larger field of work in which they operate. They likewise fail to account for the far more powerful tools they will have available with each new generation of technology. (p. 12)

A similar sentiment appears in Moravec's (1988) seminal work on ultra-intelligence. He contends, "We are at the start of something quite new in the scheme of things. Until now we have been shaped by the invisible hand of Darwinian evolution, a powerful process that learns from the past but is blind to the future" (p. 158). Again, the emphasis on a lack of vision suggests that the real barrier to scientific and technological progress is a limited gaze. And, in a related vein, Vinge (1993) argues that the contemporary means for assessing and describing science and technology cannot account for the types of changes implicit in the transition to the Singularity.

Thus, for Singularitarians, the primary barrier to techno-utopia is the limited perspective in the fields necessary for its manifestation. That there are scientists, technologists, and engineers who would challenge the trajectory of the Singularity merely reflects a narrow view of the potentialities of progress. As such, an alternative vision is warranted, one that sees the material constraints of the present and looks beyond them for strategies to achieve perfection. In the next section, I illuminate the rhetorical strategies that Singulitarians use to convince audiences that the means for transcendence exist.

The Means of Transcendence

Proponents of the Singularity confront the limits of science and technology by employing two interrelated rhetorical strategies for achieving techno-transcendence. First, Singularitarians argue that audiences should widen their gaze, seeing the present as part of a longer, evolutionary timeline that illustrates the likelihood of their vision. Second, Singularitarians point to

contemporary examples of scientific and technological progress as evidence of the foundations for the Singularity.

The Singularity as Evolution

The first strategy for illuminating the available means of transcendence is to characterize the Singularity as part of the evolutionary process of humanity. As Kurzweil (1989) notes, "Evolution created human intelligence. Now human intelligence is designing intelligent machines at a far faster pace. Yet another example will be when our intelligent technology takes control of the creation of yet more intelligent technology than itself" (p. 47). Yet, implicit in this characterization of technological progress as evolutionary is an underlying notion of time.

In particular, the current state of science and technology might seem like too substantial a barrier to ultra-intelligent machines. However, this treatment of progress (and by implication, time) is fixed, even linear, seeing the possibility of tomorrow as dictated by the capabilities of today. Singularitarians attempt to change this perspective by constructing linearity as the exception rather than the rule. As Kurzweil (1999) contends, "Time only seems to be linear during those eons in which not much happens. Thus most of the time, the linear passage of time is a reasonable approximation of its passage. But that's not the inherent nature of time" (p. 10). This characterization of time diminishes the significance of any single, temporal moment by expanding the scope of the reference to consider the larger narrative of evolution.

The rhetorical function of evolutionary discourse. Discourses of evolution appear throughout much Singularitarain rhetoric. For example, Kurzweil (2005) notes, "The Singularity denotes an event that will take place in the material world, the inevitable next step in the evolutionary process that started with biological evolution and has extended through human-directed technological evolution" (p. 387). Vinge (1993) contends,

> The best analogy I see is with the evolutionary past: Animals can adapt to problems and make inventions, but often no faster than natural selection can do its work – the world acts as its own simulator in the case of natural selection. (p. 12)

Moravec (1988), describes the Singularity as the culmination of a "process [that] began about 100 million years ago, when certain gene lines hit upon a way to make animals with the ability to learn some behaviors from their elders during life, rather than inheriting them all at conception" (p. 2). Additionally, Miller (2012) suggests that "the blind forces of evolution" (p. 202) gave rise to memory and learning as tools, an indication that such a force will also make possible the conditions for ultra-intelligent machines. This strategy of weaving the discourse of evolution into the Singularitarian narrative alters the audience's perception of time, and encourages them to see the transition to techno-transcendence as a natural process.

Altering the audience's experience with time. Characterizing the Singularity as the next step in the evolution of humanity imbues the process with a dynamic sense of time. Frentz (1985) offers a useful assessment on the rhetorical construction of temporality, describing two ways in which humans can experience time: the encounter level and the form of life level. He writes, "When we experience time on the encounter level, it is the quantitative cumulation of temporal units—seconds, minutes, hours, days. Ontically real, encounter time is the stuff that ages us, makes cars rust, and codifies nicely into maxim" (p. 7). Here, "our temporal connection to past and future is limited to the spatio-temporal boundaries of the encounter context in which the episode occurs" (p. 7). And, lacking a larger narrative into which individual, temporal experience can be sutured, everyday actions appear devoid of a trajectory towards transcendence or unity (Rushing, 1986).

Alternatively, and in distinction to an experience with time as a singular moment, isolated from context, individuals sometimes

> experience the temporal holism of a form of life all at once, in the consciousness of the present in an on-going conversation, they place themselves in a narrative context in which past and potential conversations are experienced as an historical unity emerging in the present—a unity whose evolving direction can be determined in part through cooperative action. (Frentz, 1985, p. 7)

In this type of temporal experience, individuals understand the material present as part of a trajectory in which they actively participate with others in "crescendo, catharsis, and denouement by probing the surface of linear time to discover the implicit plot which leads toward or away from humanity's *telos*" (Rushing, 1986, p. 268). The result is that individuals see themselves as "actors in a dramatic story" (Frentz, 1985, p. 7), imbuing their actions with meaning beyond their actual experience.

Much Singularitarian discourse attempts to move audiences from experiencing time at the encounter level to seeing time at the form of life level. Kurzweil (1989), for instance, challenges the concept of linearity. He writes,

> Events moved quickly at the beginning of the Universe's history. We had three paradigm shifts in just the first billionth of a second. Later on, events of cosmological significance took billions of years. The nature of time is that it inherently moves in exponential fashion—either geometrically gaining in speed, or, as in the history of the Universe, geometrically slowing down. (p. 10)

By placing the audience's momentous, individualized encounters with time against a cosmic backdrop, Kurzweil implies that their experience lacks context, missing the true movement of the Universe.

Kurzweil codifies this treatment of time by naming it, "The Law of Accelerating Returns," (1989, p. 30), and formally defining it as a principle feature of history in which evolution exponentially speeds up because "*it builds on its own increasing order*. Innovations created by evolution encourage and enable faster evolution" (p. 32). Zorpette (2008) articulates this internal logic, noting that the creation of even a single ultra-intelligent machine will

> trigger a series of cycles in which superintelligent machines beget even smarter machine progeny, going from generation to generation in weeks or days rather than decades or years. The availability of all that cheap, mass-produced brilliance will spark explosive economic growth, an unending, hypersonic, technoindustrial rampage that by comparison will make the Industrial Revolution look like a bingo game. (para 3)

Much Singularitarian discourse attempts to illustrate this principle as it applies to technology.

Moravec (1999) notes that "from 1940 to 1980 the amount of computation available at a given cost increased a millionfold" (p. 57). Kurzweil (2005) reminds the audience that widespread adoption of the telephone through the late 1800s and early 1900s took nearly a half-century, while use of the cell phone reached diffusion in a decade. Similarly, Miller (2012) laments,

> If I told you that computers had to be a million times faster before we could create a human-level AI, then your intuitive reaction might be that it won't happen for centuries. However, if Moore's Law continues to hold, then in twenty years you

> will be able to buy one million times as much computing power per dollar as you can today. (p. 4)

The purpose of these arguments is to illuminate to the audience that they are living in a period of rapid progress. These examples also provide the audience with a reason not to see the present as a necessary limit on the future. While the current state of science and technology denies the possibility of the Singularity, an approach to time through the lens of evolution undermines the significance of the present. A primary discursive strategy of Singularitarians, then, is to encourage the audience to see time as narrative form, rather than as individual experiences.

An additional result of this strategy is that it establishes a particular type of relationship between humans and technology. Specifically, by describing humans as the necessary means for creation, Singularitarian discourse emphasizes a metaphor of parentage, marking the event as the natural succession of life.

The Singularity as natural. The second significant effect of characterizing the Singularity as the next evolutionary step is that it makes the transition to ultra-intelligence seem natural. This strategy is apparent in Vinge's (1998) suggestion that "there are a couple of trends that at least raise the possibility of the technological singularity. The first is a very long-term trend, namely Life's tendency, across aeons, toward greater complexity. Some people see this as unstoppable progress toward betterment" (para 9). Here, "life," which is constantly evolving, becomes the common discourse through which potential audience members can understand technological progress as one of the many likely (and inevitably occurring) instances of evolution.

This type of rhetoric is, perhaps, most apparent in Moravec's (1989) metaphor of parentage. He writes,

> What awaits is not oblivion but rather a future which, from our present vantage point, is best described by the words "postbiological" or even "supernatural." It is a world in which the human race has been swept away by the tide of cultural change, usurped by its own artificial progeny. (p. 1)

The parent-child metaphor frames a Singular world in natural terms, with humans creating and cultivating the development of their children. Of significance here is the emphasis on process rather than product. In situating ultra-intelligent machines as humanity's progeny, Moravec draws attention to the intimate relationship between humans and technology by emphasizing the transition from one to the other as a natural process (as parents birth their children). This characterization confronts a particular social anxiety regarding ultra-intelligent machines:

> Thoughtful machinery violates the equally obvious and sacred dichotomy of the living and the dead, a difference embedded in our mentality. The skills for interacting with living things, with feelings, memories, and intentions, are utterly different from the techniques for shaping insensitive dead matter. (Moravec, 1999, p. 111)

Yet, the metaphor of parentage imbues the otherwise lifeless machines with a human essence. Moravec explains, "it is likely that we, the historical root of their transcendence, will be preserved in some form" (p. 11). Thus, describing the transition to the Singularity as the movement from parent to child assuages concerns regarding alien-ness of technology.

In sum, Singularitarian rhetors construct their vision as the next step in human evolution. This strategy suggests that the audience should approach the Singularity with a fluid perspective towards time, paying attention to the form of evolution rather than their particular temporal experiences. In doing so, Singularitarians undermine challenges to their vision that identify the

current state of science and technology as a limit on progress. This strategy also implies that the transition to a Singular world is natural, an inevitable and organic process. Here, understood as progeny, technology becomes an extension of rather than threat to humanity's essence. These two interrelated strains of discourse serve as resources for the audience, providing them with the symbolic means to believe that the material and ideological barriers to the Singularity will be overcome.

In the next section, I detail that the second significant rhetorical strategy, the identification of contemporary examples of science and technology that illustrate the shift towards the Singularity.

Contemporary Indicators of the Singularity

Moravec (1999) recalls the storied matches between chess Grandmaster Garry Kasparov and IBM's Deep Blue. After recounting the specifics of each game, Moravec notes, "Several times during both matches, Kasparov reported signs of mind in the machine. In the second tournament, he worried there might be humans behind the scenes, feeding Deep Blue strategic insights" (p. 67)! Moravec's account speaks to a growing belief by many experts that signs of the Singularity are ever-present in increasingly intelligent machines. And, Kasparov's concern regarding something beyond the circuitry is only one of the many examples pointing towards ultra-intelligence. Vinge (2008), for instance, observes that, "Once upon a time, there was a continent of human-only tasks. By the end of the 1900s, that continent had become an archipelago" (para 18). These arguments contribute to an emerging strain of discourse, which contends that the foundations for the Singularity exist. This perspective is perhaps best articulated in Brooks' (2008) claim that, "Starting with the mildly intelligent systems we have today, machines will become gradually more intelligent, generation by generation" (para 7).

This element of Singularitarian rhetoric serves two functions. First, both the prevalence and intelligence of technology indicates the possibility of Singularity-like progress despite contemporary limits on scientific and technological research. Second, Singularitarians construct these examples as evidence for their future projections. In the following section, I illuminate this rhetorical strategy by first identifying the keystone exemplars Singularitarians use for their argument, and then expanding on the dual functions of such discourse.

Examples as evidence. Singularitarians point to a variety of scientific and technological endeavors that highlight the types of innovations making the Singularity more likely. These examples tend to fall in one of two categories: increased interactions between technology and the human body, and advances in artificial intelligence and nanotechnology.

Technology and the human body (Biotechnology). In order to confront a litany of biological threats to life, humans are finding an increasing number of ways to enhance their bodies through technology. As Brooks (2008) argues, "We, human beings, are already starting to change ourselves from purely biological entities into mixtures of biology and technology" (para 34). Miller (2012) describes this process, identified by many (Kurzweil, 1999; Kurzweil, 2005; Brooks, 2008) as perhaps the integral step in the transition to posthumanity, as a "Kurzweilian merger" (p. 7), borrowing from Kurzweil's heavy-handed emphasis on symbiotic partnerships between humans and machines. And, evidence of this merger is abundant.

In particular, experts point to the increased use and proficiency of prostheses. For example, Vinge (2008) contends that the development of neural prostheses, which "has mainly involved hearing, vision, and communication" (para 21) are "the sorts of things we should track going forward, as signs of progress toward the singularity" (para 21). At the core of this

discussion are advances in brain-machine interfaces, such as cochlear and ocular implants. As Brooks notes,

> More than 50,000 people have tiny computers surgically implanted in their heads with direct neural connections to their cochleas to enable them to hear. In the testing stage, there are retina microchips to restore vision and motor implants to give quadriplegics the ability to control computers with thought. (para 35)

Of significance in these developments is not just their ability to enhance the lives of their users, but also the insights they give into further integrating technology into the brain.

Kurzweil (2005), for instance, describes a significant barrier to current attempts at brain-machine interfacing, noting that, "A key challenge in connecting neural implants to biological neurons is that the neurons generate glial cells, which surround a 'foreign' object in an attempt to protect the brain" (p. 195). However, in recent research on both cochlear and deep-brain implants (used for Parkinson's patients), scientists are discovering new ways to encourage the brain to embrace technological enhancements. And, a variety of organizations and institutions, including the Defense Advanced Research Projects Agency, are spending millions of dollars to use this technology in a variety of new ways (Kurzweil, 2005).

In addition to advances in neural prostheses, Singularitarians also point to the increased use of technology throughout the rest of the body. Brooks (2008) observes, "We replace hips and other parts of our bodies with titanium and steel parts" (para 35) and that "Robotic prosthetic legs, arms, and hands are becoming more sophisticated" (para 35). Similarly, Kurzweil (2005) details biotechnology and genome research on genes and cells (and the diseases transmitted through them). He writes, "Many new therapies now in development and testing are based on

manipulating them [genes] either to turn off the expression of disease-causing genes or to turn on desirable genes that may otherwise not be expressed in a particular cell type" (p. 213).

Moreover, Kurzweil suggests that the type of research described above will likely contribute to "reengineered bodies" (p. 305). For example, he contends that current methods for replacing body parts (prostheses) have led to an increased understanding of the skeleton, but are limited in their capacity. Thus, building on this knowledge, scientists can pioneer the "human skeleton 2.0" (p. 307), consisting of interlinking nanobots that will be strong and self-repairing. Yet, bones are not the only replaceable parts of the body. He continues, "Although artificial hearts are beginning to be feasible replacements, a more effective approach will be to get rid of the heart altogether" (p. 306). And, based on emerging models in nanotechnology, humans will develop "programmable blood" (p. 305), capable of downloading "software to destroy specific infections hundreds of times faster than antibiotics" (p. 306).

Each of these examples serves an important function in Singularitarian rhetoric. Specifically, they provide audience members with evidence for the types of innovations that might act as foundations for the Singularity, possibilities for achieving techno-utopia. And, in emphasizing the use of technology to enhance (or remedy) the body, Singularitarians present a vision in benevolent terms, intimately tying technological progress to important values (i.e. health, quality of life). The audience, then, should see in the Singularity the potential for salvation. A separate but related strain of Singularitarian discourse emphasizes significant (and historical) trends towards techno-transcendence: artificial intelligence.

Advances in artificial intelligence. Underlying a vision of the universe enhanced by ultra-intelligence are emerging trends in artificial intelligence. As Kurzweil (1999) notes, this field has been energized by an "intense and often uncritical passion" (p. 70) since a suggestion

by Alan Turing (widely regarded as a pillar of artificial intelligence) in the middle of the 20th century that a machine might eventually interact with (and as) a human. Since then, "Our many species of machine intelligence have woven themselves so seamlessly into our modern rain forest [a metaphor for everyday environment] that they are all but invisible" (p. 71). Recent advances in artificial intelligence include the development of machines adept in natural language and the proliferation of robots.

These developments are foundational elements in Singularitarian rhetoric. For example, Miller (2012) describes one possible path to the Singularity as an "intelligence explosion" (p. 13), where "a single AI might go from being human-level intelligent to being something closer to a god, what I call an *ultra-AI*, in a period of weeks, days, or even hours" (p. 13). Similar accounts appear throughout Singularitarian texts (including Kurzweil, 1999; Kurzweil, 2005; Moravec, 1999), and each suggests the possibility of the first intelligent machine as the precursor to "an exponential runaway" (Vinge, 1993, p. 12) of artificial intelligence. These musings are an integral part of a rhetorical strategy that asks audiences to re-interpret their encounters with time. By constructing a scenario in which one achievement can discard contemporary rules governing scientific and technological progress (and, seemingly, the amount of time it would take for such progress), Singularitarians tie the present (current efforts towards artificial intelligence) to their vision of the future.

A supplement to this strategy is to remind audiences that forces beyond their control will likely ensure the development of such a machine. Hanson (2008), for instance, argues that the economic benefits of ultra-intelligence will continue to drive research. He notes that both the speed with which intelligent computers could learn and the minimal cost it would take to produce and maintain such a workforce are factors contributing to private efforts towards

artificial intelligence. Miller (2012) confirms this assessment, reminding the audience that while farmers now account for less than 2% of the American workforce (down from 38% in 1900), America produces more food each year because of significant developments in agricultural technology.

Additional influence for these types of projects comes from the United States Military, which has been on the cutting edge of artificial intelligence. Kurzweil contends, "We saw the first effective example of the increasingly dominant role of machine intelligence in the Gulf War of 1991" (1999, p. 71). During this conflict, "intelligent scanning by unstaffed airborne vehicles" (p. 71) and "weapons finding their way to their destinations through machine vision and pattern recognition" (p. 71) replaced the "cornerstones of military power" (p. 71), including geography, firepower, and troops. Similarly, both the 2002 military campaign in Afghanistan and the 2003 war in Iraq saw the debut and diffusion of the "armed Predator" (2005, p. 280), which destroyed "thousands of enemy tanks and missile sites" (p. 280). Currently, DARPA is refining (rather publically, nonetheless) two robotics efforts that would supplement the use of human troops in the battlefield, setting the stage for a potentially "completely robotic army" (Anthony, 2013, para 5).

Much as evolutionary discourse is used to make the audience feel as if the transition to the Singularity is natural, these examples rely on historical (arguably positive) trends as evidence for the necessity of continued evolution through artificial intelligence. If the audience can begin to see their reality as a product of significant but subtle shifts towards technological ubiquity, perhaps they might also see the value of efforts in that vein as well as the potential benefits of a Singular world. And, a final strain of discourse emphasizes the benevolence of these types of progress.

Nanotechnology. The third category relates to nanotechnology. Kurzweil (2005) notes, "Nanotechnology promises the tools to rebuild the physical world—our bodies and brains included—molecular fragment by molecular fragment, potentially atom by atom" (p. 226). In particular, Singularitarians identify nanotechnology as both the means of achieving techno-transcendence and the building blocks for existing in a Singular world. Miller (2012) contends that nanotechnology is "the key enabler of a Kurzweilian merger: that is what we would use to construct and regulate the nonbiological part of ourselves" (p. 8). Kurzweil (2005) explains more thoroughly how nanotechnology might achieve the Singularity, suggesting, "rapid progress has been made, particularly in the last several years, in preparing the conceptual framework and design ideas" (p. 228) involving nanotechnology that will in turn carry on the Law of Accelerating Returns.

Specifically, nanotechnology will have two significant, interdependent effects on Singularitarian-style progress. First, in shrinking the relevant elements of computers (i.e. transistors, chips), nanotechnology will necessarily increase the computational efficiency and power of a given machines. For example, the first working model of a single-atom transistor, developed and tested in 2012 (Tally, 2012), signals the most likely scenario for advances in quantum computing, a requirement for ultra-intelligent machines (Kurzweil, 2005). Second, and as a result of increasingly efficient and intelligent machines, nanotechnology will diminish energy consumption across a variety of industries while also streamlining current methods of extraction and refinement (Kurzweil, 2005). The resulting economic incentive for major corporations and organizations to cut costs and increase yields by developing efficient technology will likely drive such developments (Miller, 2012). As such progress builds on itself, with each advance producing more intelligent means of achieving a variety of goals, "physical

technologies, such as manufacturing and energy, will become governed by the law of accelerating returns. All technologies will essentially become information technologies" (Kurzweil, 2005, p. 243).

Additionally, advances in nanotechnology will drive research and development in both biotechnology and artificial intelligence. For instance, the use of nanobots to diagnose ailments and deliver the appropriate remedies by moving through the bloodstream can revolutionize internal medicine (Kurzweil, 2005). Similarly, nanotubes, tiny cylinders of carbon atoms, will make possible smaller and faster transistors, which will be key to ultra-intelligent machines (Kurzweil, 2005). Given the current state of such research, the economic demand from key industries, and the Law of Accelerating Returns, Kurzweil believes that the kinds of nanotechnology necessary for the Singularity will likely be developed by 2025 (2005; Miller, 2012).

A primary element of utopian Singulartiarian discourse is to identify contemporary examples of progress as evidence for the possibility of their vision. Specifically, these rhetors point to advances in biotechnology, artificial intelligence, and nanotechnology as three interrelated fields paving the way for techno-utopia, and suggest that such changes are (and have been historically) valuable. The audience, then, should look upon the current state of science and technology as the benevolent seeds of a techno-revolution to come, rather than as a practical limit to transcendence. Yet, pointing to contemporary indicators of the Singularity serves an additional noteworthy function: to establish the credibility of the vision of a utopian future.

Examples as credibility. Much Singularitarian discourse emphasizes current trends in science and technology so that audiences might see the proverbial dots connecting the present to the techno-utopian future. However, in between "now" and "then" is a murky space where, even

by Singularitarian accounts, progress will explode in seemingly unpredictable ways. Thus, for audience members willing to accept that contemporary technologies are sufficient benchmarks on the path to the Singularity, they must also accept that there is merit in Singularitarian predictions of the unpredictable. Or, put another way, these rhetors must both justify their projections, while also justifying their credibility to predict the future.

O'Leary (1997) discusses this as an issue of authority, noting that arguers making predictive claims often rely on their expertise/experience regarding the subject-matter as evidence for their ability to forecast. In particular, predictive claims based in technical discourse (i.e. scientific or technological issues), "function as tests of theory and hence are subject to more rigorous standards of proof" (p. 311). This type of discourse "operates rhetorically by linking the 'rational' with the 'oracular' voice" (O'Leary, 1994, p. 13).

As the "most well known advocate of the Singularity" (Esget, 2014, para 1), Kurzweil's discourse is dependent on his credibility. As one author notes, he "is both famous and infamous for his technological predictions" (The technological citizen, 2010, para 5), having accurately predicted a number of technological events. For example, In *The Age of Spiritual Machines* (1999), Kurzweil claims to have made 108 predictions regarding technology (Saenz, 2010b), each set to resolve in a given decade (i.e. 2009-2019). These include the prevalence of speech-to-text conversion software, the abundance of airborne drones in combat, and the development of three-dimensional computer chips (Kurzweil, 1999). Kurzweil claims that of his 108 predictions, 102 were "essentially correct" (Saenz, 2010b, para 1). Kurzweil, then, should appear to the audience as a credible source for predicting changes in technology. And, given his previous success with relevant projections, the audience should feel comfortable accepting Kurzweil's expertise for material proof.

Of interest, though, is not merely Kurzweil's success, but also his reason for making predictions about technology in the first place. He writes,

> there are at least apparent similarities between anticipation of the Singularity and anticipation of the transformations articulated by traditional religions. But I did not come to my perspective as a result of searching for an alternative to customary faith. The origin of my quest to understand technology trends was practical: an attempt to time my inventions and to make optimal tactical decisions in launching technology enterprises. (2005, p. 370)

This passage is significant to Singularitarian rhetoric for two reasons. First, it eschews religious discourse as a primary means of sense making, instead suggesting that the Singularity is best understood through technical, rational terms. The Singularity, for Kurzweil, "is not a matter of faith but one of understanding, pondering the scientific trends" (p. 370). Those willing to accept the vision are enlightened, having seen the true curve of progress beyond the material present.

Second, this passage encourages the audience to see Kurzweil in a particular role. As he makes clear, his predictions are not those of a prophet, who requires a "direct experience of divinity" (O'Leary, 1997, p. 296). Rather, Kurzweil is merely a smart investor who "started pondering the relationship of our thinking to our computational technology as a teenager in the 1960s" (p. 370). Kurzweil is an observer, a social scientist, even an historian, who has taken everyday information and identified underlying, important patterns. Thus, embracing the Singularity does not require the audience to believe in some higher power. His methods are based in rationalistic discourse, and his previous successes predicting technological change confirms that the Singularitarian projection is likely.

In sum, Singularitarian rhetors employ two strategies for illuminating to audiences the available means of transcendence. First, Singularitarians construct their vision as part of the larger evolutionary trajectory of humanity. Second, Singularitarians identify current technologies as the foundations for techno-transcendence. Ironically, in embracing such a rationalistic persona, Kurzweil acts as a prophet for techno-reason as an alternative to traditional religion. In this way, science becomes his house of worship and progress his technological heaven.

In the next section, I illuminate the last element of utopic-Singularitarian discourse. Having identified the barriers to transcendence and illustrating the means for overcoming such obstacles, Singularitarians must justify why audiences should adopt their perspective as the preferable means for making sense of their lives.

The Singularitarian Justification for Adherence

Singularitarians face a common rhetorical problem in myth systems: justifying the belief in something transcendent. While much has been written on the potentially positive outcomes of ultra-intelligent machines, the guarantee of such a scenario is, admittedly, up in the air. As Kurzweil (2005) notes, "we cannot look past its [the Singularity's] event horizon and make complete sense of what lies beyond" (p. 29). Such a sentiment implies that for every benevolent technological advance there exists the risk of its dangerous counterpart, as "technology empowers both our creative and destructive natures" (Kurzweil, 2005, p. 396). Accordingly, much Singularitarian discourse focused on steps to produce adherence to such a trajectory, emphasizes a positive outcome. In the following section, I illustrate this final element of techno-utopian rhetoric in two sections. First, I highlight examples of risk-based discourse, which Singularitarians use to justify the audience's adherence to their vision. Then, I identify the types

of solutions that these rhetors recommend, including the political and social means for producing a beneficial Singularity.

Risk-based Discourse

The Singularitarian argument for adherence begins with an assessment of risk, combining two interrelated strains of discourse. First, Singularitarians construct the mere possibility of their vision as reason enough to embrace it. In so doing, they must account for the risks associated with the Singularity. In this effort, these rhetors suggest that the potential for risk, which they contend is endemic to all technological progress, warrants careful public consideration. Kurzweil, for instance, (2005) writes,

> People often go through three stages in considering the impact of future technology: awe and wonderment at its potential to overcome age-old problems; then a sense of dread at a new set of grave dangers that accompany these novel technologies; followed finally by the realization that the only viable and responsible path is to set a careful course that can realize the benefits while managing the dangers. (p. 408)

Here, developing frameworks for controlling possible dangers becomes a focus. This framing encourages the audience to encounter the Singularity as they encounter all technological progress, allowing them to make sense of the event through personal experience, subtly emphasizing the ubiquity of technological change.

Singularitarians, then, encourage the audience to treat the Singularity as a specific example of their larger experiences with technology adoption, emphasizing the risks as a reason for their attention. Chalmers (2010), for example, claims, "if there is even a small chance that there will be a singularity, we would do well to think about what form it might take and whether

there is anything we can do to influence the outcomes in a positive direction" (p. 4). He continues, "These are life-or-death questions that may confront us in coming decades or centuries. To have any hope of answering them, we need to think clearly about the philosophical issues" (p. 4). A similar, risk-based assessment appears in Miller's (2012) work, where he articulates the value of preparatory actions, "if you believe a friendly Singularity might be near" (p. 179).

These arguments work in concert with a separate strain of discourse that emphasizes the rapidity with which the Singularity could occur. Vinge (2008) illustrates this type of claim, musing,

> One moment the world is like 2008, perhaps more heavily networked. People are still debating the possibility of the singularity. And then something…happens. I don't mean the accidental construction that Brooks describes. What I'm thinking would probably be the result of intentional research, perhaps a group exploring the parameter space of their general theory. One of their experiments finally gets things right. The result transforms the world—in just a matter of hours. A hard takeoff into the singularity could resemble a physical explosion more than it does technological progress. (para 29)

Similar terminology appears in Miller (2012), who notes that, despite its improbability, "an intelligence explosion could, literally, happen tomorrow" (p. 209). Chalmers (2010) employs parallel language, writing that, "this event will be followed by an explosion to ever-greater levels of intelligence" (p. 1).

However, the rhetorical emphasis on the *explosiveness* of the Singularity indicates a difficulty in controlling the event, suggesting in turn a need for the audience's immediate

consideration. Such a strategy encourages the audience to view the Singularity as inevitable. Therefore, the greatest risk is willful ignorance.

The Means of Protection (Producing a Positive Singularity)

Given the uncertainty, Singularitarians focus on a potentially transformative future. Vinge (1993) articulates this techno-utopia as "the Asimov Dream," writing,

> Imagine a willing slave, who has 1000 times your capabilities in every way. Imagine a creature who could satisfy your every safe wish (whatever that means) and still have 99.9% of its time free for other activities. There would be a new universe we never really understood, but filled with benevolent gods. (p. 16)

Invoking Asimov's famous "Laws of Robotics," Singularitarians emphasize the need to shape the development of ultra-intelligence to produce a positive outcome. Chalmers (2010) suggests that a benevolent Singularity might be the product of internal and external constraints on technological progress.

Internal constraints. Chalmers (2010) notes of ultra-intelligent machines, "we might try to constrain their cognitive capacities in certain respects, so that they are good at certain tasks with which we need help, but so they lack certain key features such as autonomy" (p. 24). In particular, internal constraints are often described in terms of values. Kurzweil (2005), for example, contends that in order to deal with significantly advanced artificial intelligence, "Our primary strategy in this area should be to optimize the likelihood that future nonbiological intelligence will reflect our values of liberty, tolerance, and respect for knowledge and diversity" (p. 424). And, Brooks (2008) echoes this means of control, arguing, "By being careful about what we instill in our machines, we simply won't create the specific conditions necessary for a

runaway, self-perpetuating artificial intelligence explosion that runs beyond our control and leaves us in the dust" (para 37).

Through these accounts, Singularitarians emphasize the importance of advanced but benevolent machines. However, "Intelligence is inherently impossible to control" (Kurzweil, 2005, p. 409). Thus, internal constraints are necessary but potentially insufficient for producing a positive Singularity. In this case, there is a need for "defensive technologies" (p. 409), external constraints that could undermine the proliferation of malevolent machines.

External constraints. Chalmers (2010) worries that, "Even if we have designed these systems to be benign, we will want to verify that they are benign before allowing them unfettered access to our world" (p. 29). Specifically, he outlines two concerns: "First, humans and AI may be competing for common physical resources: space, energy, and so on. Second, embodied AI systems will have the capacity to act physically upon us, potentially doing us harm" (p. 29). In either of these scenarios, the values imbued as internal constraints might not be enough to ensure the benevolence of ultra-intelligence. Instead, what humans must do is develop both safe methods for implementing ultra-intelligence and means for responding to their potential malevolence.

Kurzweil (2005) suggests that external constraints are an issue of public policy, and are best approached as existential risks. He writes, "In terms of public policy the task at hand is to rapidly develop the defensive steps needed, which include ethical standards, legal standards, and defensive technologies themselves" (p. 416). In particular, he contends that, "*the bulk of this investment today should be in (biological) antiviral medications and treatment*" (p. 422), including reforms in the regulatory processes and ethical guidelines currently shaping developments in biotechnology. Additionally, Kurzweil likens the need for oversight and

preemptive actions (i.e. policing by international organizations and authorities) regarding technological progress to the ways in which missiles, biological viruses, and software viruses are currently handled (2005).

In sum, the final element of utopian Singularitarian discourse asks the audience to consider and adhere to the vision. This is achieved by two interrelated rhetorical strategies. First, Singularitarians implore the audience to engage in productive, preparatory strategies before they lose the ability to control the outcome. Second, Singularitarians' endorse methods for curtailing the risks of ultra-intelligence. The result is an argument that suggests the audience should embrace something beyond their material experiences with technology and modify their beliefs and behaviors to achieve such transcendence.

Conclusion

In this chapter, I have argued that Singularitarian rhetoric is a particular variant of techno-utopianism. To accomplish this, I first suggested that utopian discourse consists of three interrelated strategies, including the identification of barriers to transcendence, the means for overcoming such barriers, and a justification for the audience's adherence to the utopian trajectory. Techno-utopianism, as a contemporary strain of utopian discourse, highlights the role of technology in achieving a transcendent future.

Having established a pattern and relevant themes underlying techno-utopian rhetoric, I illuminated the form of Singularitarian discourse. In particular, Singularitarians identify both material and ideological barriers to techno-transcendence. As a means for transcending these narrow accounts of progress, Singularitarians employ evolutionary discourse to encourage audience members to see their vision as part of natural trajectory for humans. Also, Singularitarians point to advances in relevant fields (biotechnology, artificial intelligence, and

nanotechnology) as evidence of the subtle but significant progress towards their vision. Finally, Singularitarians attempt to justify the audience's attention and adherence by characterizing the event in risk-based terms.

Thus, Singularitarian discourse mirrors the persuasive form of techno-utopianism. As Nordmann (2008) notes, the "singularitarian myth" (p. 4) has become a captivating story. Vance (2010) suggests that one reason for the salience of this discourse is the "modern-day, quasi-religious answer to the Fountain of Youth" (p. 2) it offers potential adherents. Popper (2012) argues that Singularitarians have made a "religion of rationality" (p. 3). These sentiments reflect the unique use of science and technology as an entry point into the realm of the symbolic.

Specifically, the Singularitarian story begins with rationalistic discourse, and then narratively transports the audience to a perfect future. In between the audience's contemporary experience with technology is cited in support of a vision of techno-utopia to come. Yet, the fantastic account of an intelligence explosion suggests something beyond technical reason. Ultimately, current science cannot describe the approaching utopia. Thus, in the Singularity, the distinction between rationalistic and mythic discourse blurs, as Singularitarians draw on the vocabulary of science and technology to present a vision of transcendence that is fundamentally mythic, not scientific, in nature.

There is an apparent paradox at the heart of this chapter. Nearly all the pro-Singularity positions I have describe are highly rationalistic, but the conclusion to the Singularitarian narrative is based in myth, a vision of a perfect future—a techno-utopia—to come. Kurzweil and others have made reason their god, but they describe a utopia in which present conceptions of reason have been transcended. In that way, the description of the post-Singularity world is fundamentally mythic. For Kurzweil, god will soon be in the machine.

To be a Singularitarian, then, is to embrace a cultural narrative that intertwines technical and narrative discourse, promoting a benevolent account of the future. Yet, while the Singularitarian myth attracts many, it is not without its detractors. In the next chapter, "The Robot, the Bomb, and the Future," I describe anti-Singularity discourse to determine the form of responses to techno-transcendence.

Chapter Four: The Bomb, the Robot, and the Future

The Singularitarian trajectory culminates in mythic transcendence. For those audience members willing to embrace technology as the next step in the human story, Singularitarian rhetors promise a fundamental, existential transformation. As Brooks (2008) notes, "Some singularitarians believe our world will become a kind of techno-utopia, with humans downloading their consciousness into machines to live a disembodied, after-death life" (para 6). Yet, Vance (2010) observes in an examination of the Singularitarian culture that, "one person's utopia is another person's dystopia" (para 11). Similarly, Joy (2000) argues that, "A technological approach to Eternity – near immortality through robotics – may not be the most desirable utopia, and its pursuit brings clear dangers" (p. 15). Brooks (2008), articulating those dangers, suggests that some "anticipate a kind of technodamnation in which intelligent machines will be in conflict with humans, maybe waging war against us" (para 6). These sentiments are typical of an influential counter-narrative, broadly described as anti-Singularity discourse, which suggests that the perils, rather than the promises, of technology should inform social and cultural attitudes.

Whereas Singularitarian rhetoric relies on mythic reasoning, allowing the audience to tap transcendent truth, anti-Singularity discourse acts as a secondary allegory (Milford, 2010). Here, audiences symbolically extract meaning from a variety of social and cultural texts and use them to imbue a pre-text with contemporary relevance. Specifically, I argue that anti-Singularity rhetoric relies on a confluence of two strains of discourse, historical examples of technology gone awry and dystopian science fiction, to produce pessimistic social truths towards technology.

Thus, in the remainder of this chapter, I use the form and function of secondary allegory to illuminate the rhetorical strategies underlying anti-Singularity discourse. To accomplish this, I

first examine the use of historical examples of technology gone wrong as pre-texts for technological anxiety. Next, I identify the role of science fiction in informing skeptical perspectives towards the Singularity. Then, I detail the resultant narrative themes, prevalent throughout much anti-Singularity discourse, that act as social truths and encourage audiences to approach technology pessimistically.

Given the prevalence of anti-Singularity rhetoric in academic, technical, and popular discussions of technological progress, much of this analysis draws on Bill Joy's (2000) article, "Why the Future Doesn't Need Us." Joy, co-founder of Sun Microsystems and a "key player in the Internet boom and development of the Web" ("Bill Joy," 2014, para 2), penned the now "well-known piece" (Messerly, 2011, para 1) that has become an oft-cited foundation for skeptics. As Barrat (2013) notes, "In nonscholarly literature and lectures about the perils of AI, I think only Asimov's Three Laws of Robotics are cited more frequently, albeit misguidedly, than Joy's hugely influential essay" (p. 134). Accordingly, many of the prevailing themes in anti-Singularity discourse build on or extrapolate from Joy's text, and the following analysis reflects this treatment.

The Form of Anti-Singularity Discourse

Much research suggests that traditional notions of allegory cannot adequately account for the contemporary relationship between narrative and how audiences form attitudes (Milford, 2010; Milford & Rowland, 2012; Phair, 2010). Specifically, these scholars contend that the proliferation of media and resonant narratives have produced alternative allegorical forms, not necessarily requiring single, sacred pre-texts, as in traditional allegory. Instead, contemporary allegory might also be understood as the confluence of various narratives (including but not limited to popular culture), and shared historical or cultural experiences that act as pre-texts

(Milford, 2010; Milford & Rowland, 2012). This form of secondary allegory, which has the audience extract symbolic meaning from a variety of texts and cluster them around a relevant pre-text, is a useful means for understanding anti-Singularity discourse.

In particular, I argue that anti-Singularity rhetoric relies on two strategies for establishing pre-texts. First, these rhetors use historical examples of the destructive side of technology as pre-texts for cautious perspectives towards technological progress, with a specific emphasis on the atomic bomb. Second, these rhetors invoke popular science fiction to both encourage audiences to interpret current advances in dystopian terms and simultaneously undermine the use of science fiction as a rhetorical shield in defense of Singularitarian perspectives. In the following section, I illuminate these two strategies.

History as Pre-Text

Anti-Singularity rhetoric references historical examples of destructive technology to provide audiences with evidence for technological pessimism. These examples function as pre-texts: true accounts of technology's negative effects that can imbue contemporary analogues with new meaning. The internal logic of this strategy is illustrated by Barrat's (2013) observation that, "We've learned what happens when technologically advanced beings run into less advanced ones: Christopher Columbus versus the Tiano, Pizzaro versus the Inca, Europeans versus Native Americans. Get ready for the next one. Artificial superintelligence versus you and me" (p. 30). Here, Barrat (2013) establishes a symbolic pattern that characterizes artificial intelligence and humans in a dyadic relationship of oppressor and oppressed, and history becomes a vehicle for giving contemporary technological progress new (or additional) meaning. In particular, a focus on the atomic bomb has become an abiding theme in anti-Singularity discourse.

The atomic bomb. Anti-Singularity rhetors reference the atomic bomb as an example of the problems of firm commitments to scientific and technological progress. This strategy is articulated by Joy (2000), who argues, "We should have learned a lesson from the making of the first atomic bomb and the resulting arms race. We didn't do well then, and the parallels to our current situation are troubling" (p. 10). Again, the emphasis on an historical catastrophe wrought by technology symbolically shapes contemporary practices. And, by analogizing the two situations, anti-Singularity rhetors develop two powerful strains of argument: the problem of motives and the problem of outcomes.

Kenneth Burke worries that implicit in social, cultural, or ideological commitments to technological progress are a psychosis, a potentially misguided belief that "The *opportunities* to produce further and further 'generations' of contrivances are indistinguishable from the *compulsions* to do so" (1984, p. 396). Burke's concern is one of motive: that possibility acts as a substitute for desirability. This sentiment informs much anti-Singularity discourse, and is illustrated in references to the atomic bomb. For example, Joy (2000) contends,

> Now, as then, we are creators of new technologies and stars of the imagined future, driven – this time by great financial rewards and global competition – despite the clear dangers, hardly evaluating what it may be like to try to live in a world that is the realistic outcome of what we are creating and imagining. (p. 12)

In this passage, Joy (2000) symbolically aligns the Singularity with an historical disaster. Joy crystallizes this point, arguing that, "Failing to understand the consequences of our inventions while we are in the rapture of discovery and innovation seems to be a common fault of our scientists and technologists" (p. 6). Thus, the Singularity, like the atomic bomb, illustrates the means by which motive can become blindness.

Having symbolically equated the two events by analogizing their emphasis on motive rather than outcome, Joy then argues that there is no need to push for the Singularity, "This time – unlike during the Manhattan Project – we aren't in a war, facing an implacable enemy that is threatening our civilization; we are driven, instead, by our habits, our desires, our economic system, and our competitive need to know" (p. 13). Combined with his criticisms of deterministic motives, this claim creates a robust indictment of the Singularitarian commitment to technological progress: it was wrong to privilege motives in the past, it would be far worse to privilege lesser motives in the present. A separate strain of discourse more directly articulates the effect of such motives by referencing the atomic bomb to illustrate a possible *outcome* of rigid commitments to technology.

As Barrat (2013) notes, "With the invention and use of nuclear weapons, we humans demonstrated that we are capable of ending the lives of most of the world's inhabitants" (p. 14). Here, Barrat underscores the significance of that historical moment when global destruction became a reality. Yet, as a measure of catastrophe, parallels to the atomic bomb function as symbolic floors rather than ceilings. Barrat continues, "Or maybe you have not yet grasped how artificial intelligence could pose an existential threat to mankind, a threat greater than nuclear weapons or any other technology you can think of" (2013, p. 16). Joy (2000) adds,

> I frankly believe that the situation in 1945 was simpler than the one we now face. The nuclear technologies were reasonably separable into commercial and military uses, and monitoring was aided by the nature of atomic tests and the ease with which radioactivity could be measured. (p. 14)

The situation is more threatening today. The Singularity "will not require large facilities or rare raw materials. Knowledge alone will enable the use of them" (p. 4). Joy concludes, "we are on

the cusp of the further perfection of extreme evil, an evil whose possibility spreads well beyond that which weapons of mass destruction bequeathed to nation-sates, on to a surprising and terrible empowerment of extreme individuals" (2000, p. 4).

Anti-Singularity discourse, then, establishes an historical analogue for interpreting contemporary technological progress. Comparisons to the atomic bomb illuminate the problems of overly deterministic motives and the potential for disaster. Yet, the identification of parallels between the past and the present is an incomplete rendering of anti-Singularity rhetoric. This strategy also relies on a separate strain of discourse to articulate the perils of technological optimism, popular dystopian narratives about the future.

The Role of Science Fiction in Anti-Singularity Discourse

Science fiction and contemporary technology are intimately bound to one another. Many of the most influential scientists and technologists were inspired by the stories of a future made better through technology. For example, Bill Joy (2000) describes the original *Star Trek* series as formative, writing,

> Roddenberry's vision of the centuries to come was one with strong moral values, embodied in codes like the Prime Directive: to not interfere in the development of less technologically advanced civilizations. This had an incredible appeal to me; ethical humans, not robots, dominated this future, and I took Roddenberry's dream as part of my own. (p. 5)

Here, science fiction acts as a guiding light for significant technological advances. And, while "Golden Age" science fiction was motivating young inventors and entrepreneurs, initial work on artificial intelligence "inspired sci-fi writers like Arthur C. Clarke" (Horgan, 2008, para 14). As such, optimistic narratives about technology and the future begot progress, and vice versa.

Yet, such optimism subsided. Emerging concerns about the future formed a counter-narrative to hopeful tales of discovery through science. I. J. Good, a pioneer in modern computing, highlights this turn in his now foundational work on artificial intelligence, noting,

> Thus the first ultraintelligent machine is the last invention that man ever need make, provided that the machine is docile enough to tell us how to keep it under control. It is curious that this point is made so seldom outside of science fiction. It is sometimes worthwhile to take science fiction seriously. (p. 3)

Barrett (1979) adds that "there is no doubt that the suspicion of technology has become so widespread that the dominant myth of our time may very well become that of Frankenstein's monster" (p. 24).

Anti-Singularity discourse, as the contemporary manifestation of concerns about technological progress, invokes these pessimistic, dystopian science fiction narratives. In particular, I argue that anti-Singularity rhetors draw on science fiction in two ways. First, science fiction acts as a pre-text, encouraging audiences to extract dystopian themes and apply them to their current situation. Second, and alternatively, science fiction can be used to undermine technical conversations about the risks of technology.

Science fiction as a pre-text. Anti-Singularity discourse often invokes elements of dystopian narratives to encourage audiences to cautiously or pessimistically approach technological progress. In building this argument, I first describe common dystopian science fiction about technology, and then I show how anti-Singularity discourse draws upon this literature.

Perhaps the first iteration of such stories, Judaism's Golem, "revolves around the animation of an inanimate statue" (Kove, 2000, p. 217) and suggests that it is the "creator of the

golem who is responsible for controlling the growth of the creature's power" (Covino, 1996, p. 360). Covino (1996) notes that, "he [the golem] functions like a machine, prompting the observation that products of both magic and mechanism serve the same impulse" (p. 363). The golem archetype is symbolically extracted from a mythic, religious system and given new meaning through technological discourse. Covino continues, "Like the golem who goes on an unintended rampage of death and destruction, the automaton will carry out directives without critical consciousness or conscience, even to the point of catastrophe" (p. 364).

In 1920, the destructive automaton was given an enduring identity in Karel Capek's *R.U.R*. The story, which follows the development of and subsequent domination by robots, integrates the perils of the golem with the increasing interaction between humans, machines, and society (Horokova & Kelemen, no date). The robot, now the symbol for artificial intelligence (Barrat, 2013), has become a "venerable trope in movies, books, and films" (Barrat, 2013, p. 88), often with dystopian themes.

For example, the early 1980s produced two such narratives that have gained near-canonical cultural status. Both *Blade Runner* (1982) and *The Terminator* (1984) highlight the problem of intelligent machines run amok. In both stories, the audience encounters a protagonist tasked with protecting others from homicidal robots. *The Matrix* (1999) offers an updated account of dominant technology, featuring a hero waging a war against intelligent machines bent on harvesting humans for energy. Notably, even optimistic accounts of artificial intelligence have been overshadowed by the prevalence of technological pessimism.

The movie, *I, Robot* (2004), a title drawn from a famous collection of Isaac Asimov's robot stories, abandons Asimov's sympathetic reading of robots in favor of a vision of malevolent machines determined to eradicate their creators. Additionally, Braine (1994) notes

that changes in *Star Trek*, from the original series through the popular *The Next Generation*, illustrate the increasing influence of dystopian themes. Braine (1994) writes,

> distinctive features of *The Next Generation*—the fascination with, and domestication of, the technical realm, the suggestion of uncertainty about the future, the predilection for inner life over outer exploration, the emphasis on physical safety and emotional security—related it to many contemporary concerns, including growing ambivalence about the technological, and set it apart from the earlier show. (p. 4)

Here, anxiety about technological progress drives the narrative. Audiences are offered a variety of examples from which to choose *the* symbolic representative for technology gone awry. And, anti-Singularity discourse frequently invokes these symbols to align contemporary advances with malignant analogues.

Joy (2000), who, as noted, was inspired by Roddenberry's vision of the future, reflects skeptically on Singularitarian accounts of the future of technology, which remind him of "the Borg of *Star Trek*, a hive of partly biological, partly robotic creatures with a strong destructive streak." (p. 4)? Moreover, while evaluating likely outcomes of artificial intelligence, Barrat (2013) invokes HAL9000, the homicidal computer from *2001: A Space Odyssey*, and Skynet, the genesis program for the self-aware robots of *The Terminator*. Critics of the Singularity, then, consistently invoke science fiction to make sense of technology.

This discursive strategy treats popular, dystopian science fiction as a pre-text for understanding contemporary technological progress. Audiences are encouraged to extract elements from these narratives that might inform skeptical or pessimistic attitudes towards technology. The result is that dystopian science fiction becomes a map for understanding the

Singualrity. Yet, anti-Singularitarians also argue that utopian science fiction about technology insulates pro-Singularity discourse from critical discussion.

Science fiction as disruptive. Anti-Singularity rhetors criticize utopian science fiction as a subversive element in public discourse about technology. In particular, these rhetors suggest that popular accounts of a utopian future can obscure the risks of technology. For instance, Barrat (2013) notes that the popularity of artificial intelligence "as entertainment has inoculated AI from serious consideration in the not-so-entertaining category of catastrophic risks" (p. 26). Additionally, the tendency of these accounts to lionize human protagonists entrenches this problem. Barrat (2013) observes that in popular narratives the odds are often "heavily in favor of the hard-bitten team of unorthodox AI professionals who just might be crazy enough to stand a chance. Everywhere else in the universe the ASI [artificial strong intelligence] team would mop the floor with the humans" (p. 14). Audiences, then, encounter technology as a drama, lifted from the technical realm, and see themselves as immune to the risks of progress.

Yudkowsky (2008) articulates the significance of this discursive shift, from technical to dramatic, arguing that these stories

> do not propose complex relations between initial conditions and outcomes—that would lose the audience. But we need relational understanding to *manipulate* the future, steer it into a region palatable to humankind. If we do not steer, we run the danger of ending up where we are going. (p. 10)

Thus, the danger in dramatizing the perils of technological progress is that audiences are unable to engage substantive issues regarding technology.

A particular iteration of this tension, between dramatic and technical discourses, is the frequent appearance of Asimov's "Three Laws of Robotics" in research regarding artificial

intelligence. Asimov's now famous "Three Laws" establish the rules governing robots throughout many of his stories, and emphasize the protection of humans and the obedience of machines. For instance, the first law states, "A robot may not injure a human being or, through inaction, allow a human being to come to harm" ("Isaac Asimov's," 2001, para 1). The second law states, "A robot must obey orders given it by human beings except where such orders would conflict the First Law" ("Isaac Asimov's," 2001, para 2). And the third law states, "A robot must protect its own existence as long as such protection does not conflict with the First or Second Law" ("Isaac Asimov's," 2001, para 3).

For many anti-Singularity rhetors, though, one problem is the treatment of these laws as established methods for safely limiting artificial intelligence. For example, Barrat (2013) claims, "unreliable as Asimov's laws are, they're our most often cited attempt to codify our future relationship with intelligent machines" (p. 21). In fact, so ingrained into scientific and technical discourse are the "Three Laws" that they are often treated as "settled science" (p. 4), indicating that even "some of the most accomplished scientists" (p. 4) have "spent little time thinking or exchanging ideas about the problem" (p. 4). Similarly, Yudkowsky (2008) observes that the "Three Laws" are the "major reference in common" (p. 38) throughout work on friendly AI, artificial intelligence programmed to be benevolent. Here, popular narratives become a substitute for substantive conversations about the risks of technology. And notably, Asimov's "Three Laws" are not necessarily followed in current AI research.

For anti-Singularity rhetors, then, popular utopian science fiction plays an integral role in shaping the public imagination on issues of technology and the future. And, Barrat (2013) notes that this, in effect, shields pro-Singularity discourse from criticism, writing, "When a dystopian viewpoint rears its head, many bloggers, editorialists, and technologists reflexively fend it off

with some version of 'Oh no, not the Terminator again! Haven't we heard enough gloom and doom from Luddites and pessimists?" (p. 26). Consequently, anti-Singularity rhetoricians become fringe participants in "the most important conversation humanity can have" (Barrat, 2013, p. 16) about "the single most dangerous risk we face" (Yudkowsky, 2008, p. 43).

In sum, popular science fiction functions in two ways in anti-Singularity discourse. First, anti-Singularity rhetors invoke elements of dystopian science fiction to help audiences symbolically align contemporary technological progress with powerful images of destruction. In this way, science fiction becomes an allegorical pre-text. Alternatively, anti-Singularity rhetors decry the use of utopian science fiction to both desensitize audiences to the risks of technology and subvert the role of technical, cautionary assessments of progress. Yet, while it might appear that these two treatments of science fiction are inconsistent, their contrast illustrates the allegorical form of anti-Singularity discourse.

For instance, Pensky (2014) notes, "Kurzweil is perhaps best known for his science fiction-sounding predictions about the future" (para 5) and that the "Singularity makes for great science fiction, but not much else" (para 33). Similarly, another critic "worries that so many people, smart people, are taking Kurzweil's sci-fi fantasies seriously" ("Ray Kurzweil's," 2010, para 12). These objections to the Singularity make clear the distinction in rhetorical form between pro- and anti-Singularity discourses. While Singularitarians embrace a mythic trajectory, anti-Singularity rhetors deny the possibility of transcendence through technology. Rather, they encourage audiences to cobble together a variety of shared experiences or stories (history and science fiction) to make sense of technology. And, the resulting, cautionary discourse produces social truths about the risks of technological progress.

Social Truths

As a form of secondary allegory, anti-Singularity rhetoric treats historical and narrative examples as pre-texts, providing symbolic reservoirs from which audiences can extract meaning as they encounter technology. The goal of such symbolic extraction is to produce pessimistic or dystopian attitudes towards technological progress. In this section, I argue that anti-Singularity rhetors seek to produce two social truths about technology. First, anti-Singularity discourse emphasizes the potential for destruction implicit in artificial intelligence, nanotechnology, robotics, and the like. Second, these rhetors employ entelechial reasoning to emphasize the rapidity and magnitude of a Singularity-driven catastrophe.

The End of Humanity

Anti-Singularity rhetors encourage audiences to see the destructive potential of technology. Much of their strategy for accomplishing this goal is to describe the possible outcomes of the Singularity and technologies that might come out of it as posing "a different threat than the technologies that have come before" (Joy, 2000, p. 4). For example, Barrat (2013) notes "one big problem with AI disasters. They're not like airplane disasters, nuclear disasters, or any other kind of technology disaster with the possible exception of nanotechnology. That's because there's a high probability we won't recover from the first one" (p. 28). Joy (2000) worries that "on this path humanity may well be lost" (p. 7). He continues, "An immediate consequence of the Faustian bargain of obtaining the great power of nanotechnology is that we run a grave risk – the risk that we might destroy the biosphere on which all life depends" (p. 9). As such, the Singularity and related technologies might "wipe humanity from the face of the Earth" (Popper, 2012, para 24) and make the "clear danger of extinction" (Joy, 2000, p. 13) a very real possibility.

One function, then, of anti-Singularity discourse is to characterize the destructive potential of technology in extreme terms. And, by delineating the potential destruction of the Singularity and related technologies from significant, past examples of catastrophe, these rhetors imply that no historical frame of reference can adequately contextualize contemporary risks. Yudkowsky (2008) argues that the lack of relevant comparisons makes current technology more dangerous than those that caused previous disasters, writing

> We cannot consult actuarial statistics to assign small annual probabilities of catastrophe, as with asteroid strikes. We cannot use calculations from a precise, precisely confirmed model to rule out events or place infinitesimal upper bounds on their probability, as with proposed with physical disasters. But this makes AI more worrisome, not less. (p. 1)

As such, anti-Singularity rhetors offer a means for making sense of technological destruction by employing entelechial reasoning, symbolically integrating historical and narrative examples to illustrate the danger of seeking perfection through AI.

Entelechial Technology

In *A Rhetoric of Motives* (1969), Kenneth Burke articulates a concept of entelechy in which the essence of a thing is defined "narratively in terms of its *fulfillment* or *fruition*" (p. 13). Rowland and Frank (2011) add to this, describing entelechy as "a symbolic force that causes humans to extend an idea to the 'end of the line' in search of perfection, which often produces terrible results" (p. 43). I argue that anti-Singularity rhetoric relies heavily on entelechial reasoning to suggest to audiences that the birth of artificial intelligence will necessarily lead to its farthest, most destructive end. This is accomplished by symbolically integrating historical and narrative pre-texts to produce a perfect vision of an evil future.

For example, Joy (2000) contends, "once an intelligent robot exists, it is only a small step to a robot species – to an intelligent robot that can make evolved copies of itself" (p. 7). Similarly, Barrat (2013) describes the risk of "rapid recursive self-improvement that enables an AI to bootstrap itself from artificial general intelligence to artificial superintelligence. It's commonly called the 'intelligence explosion'" (p. 100). Yudkowsky (2008) also identifies a runaway scenario, noting,

> The AI becomes smarter, including becoming smarter at the task of writing the internal cognitive functions of an AI, so the AI can rewrite its existing cognitive functions to work even better, which makes the AI still smarter, including smarter at the task of rewriting itself, so that it makes yet more improvements. (p. 17)

Thus, the first AI makes possible the most destructive version of AI.

Additionally, advances that promote self-replication are uniquely identified by their entelechial potential. As Joy (2000) suggests, "robots, engineered organisms, and nanobots share a dangerous amplifying factor: They can self-replicate. A bomb is blown up only once – but one bot can become many, and quickly get out of control" (p. 4). He concludes, "It is most of all the power of destructive self-replication in genetics, nanotechnology, and robotics (GNR) that should give us pause" (p. 9). Barrat (2013) more explicitly describes the problem of self-replication, writing

> The first replicator would make one copy of itself, and there'd be two replicators making the third and fourth copies. The next generation would make eight replicators total, the next sixteen, and so on. If each replicator took a minute and a half to make, at the end of ten hours there'd be more than 68 billion replicators; and near the end of two days they would own the earth. (p. 15)

The entelechial reasoning is obvious.

The above accounts intimate a very fast timeline between the birth of AI and destruction of humanity. Such reasoning directly confronts a major tenet of pro-Singularity discourse, Kurzweil's "Law of Accelerating Returns," which optimistically characterizes rapid progress as the necessary path to transcendence. Barrat (2013) most clearly articulates this point, "Instead of leading to a kind of paradise, as Kurzweil's aggregate projections assert, I believe the Law of Accelerating Returns describes the shortest possible distance between our lives as they are and the end of the human era" (p. 131).

Moreover, anti-Singularity rhetors invoke dystopian science fiction to crystallize their entelechial concerns. For example, Barrat (2013) describes recent technological mishaps with AI in narrative terms, writing, "These aren't full-blown *Terminator* incidents, but look for more of them ahead" (p. 60). And Satell (2013b) notes, "The Terminator was, of course, a work of fiction, but the idea of cyborgs and killer machines is not all that farfetched" (para 23). Again, the Singularitarian symbolic system is treated as inherently entelechial, leading to the types of disasters in dystopian science fiction. The Borg, the Terminator, and previously discussed references to HAL9000 act as narrative shorthands, inviting audiences to understand technology in terms of its malevolent perfection.

In sum, anti-Singularity rhetoric relies heavily on entelechial reasoning to make sense of the risks of technology. These rhetors encourage audiences to approach AI research with caution, highlighting the risks of uncontrollable technological change. Anti-Singularity discourse invokes examples of technological catastrophe both in the real world and also in the imagined world of science fiction to support their worldview, urging audiences to see technology in terms of a destructive analogue.

Conclusion

In this chapter, I argued that anti-Singularity discourse relies on a combination of historical and science fiction narratives, acting as allegorical pre-texts, to encourage audiences to approach technology from a dystopian perspective. To illustrate this argument, I first outlined the prevalence of historical examples, the atomic bomb, in particular, throughout anti-Singularity texts. Here, I illuminated two emergent concerns about technological optimism. First, such optimists are blinded by their motives, confusing *opportunity* and *need* in relation to technological progress. And second, even the relevant historical analogues for destruction by technology lack the scope necessary for comprehending contemporary risks.

Having established the role of history as an allegorical pre-text, I turned to popular science fiction. Anti-Singularity discourse suggests the medium can be both productively and subversively used. For their purposes, anti-Singularity rhetors see value in symbolically aligning current technology with dystopian images (the Terminator, the Borg, etc.). Alternatively, these rhetors decry the use of popular science fiction to undermine skeptical discussions of technology. In particular, some of these critics worry that such narratives serve to shield pro-Singularity discourse from criticism.

Next, I illustrated the prevalence of two social truths emerging from anti-Singularity rhetoric: that it is destructive beyond any historical imagination and that it should be understood entelechially. First, this discourse suggests that historical analogues lack the magnitude of the risks associated with the Singularity and related technologies. And, given a lack of frames for understanding such destruction, anti-Singularity rhetors invoke entelechial reasoning to make sense of technology. Dystopian images become shorthand accounts of a possible future.

Thus, anti-Singularity discourse relies on a form of secondary allegorizing that challenges techno-transcendence and cautions audiences against technological optimism. Having illuminated both the form and function of pro- and anti-Singularity rhetoric, in the next chapter, "2045: A Rhetorical Odyssey," I discuss the implications of this study for public discourse concerning technology and rhetorical criticism, as well as offer some concluding thoughts on this analysis.

Chapter Five: 2045-A Rhetorical Odyssey

Public discourse about technology presents multiple and inconsistent views of technological change. This varied public response can be traced to two competing attitudes about technology. First, the public is excited about new gadgets and the companies that make them. Second, people worry about the long-term effects of technology on their lives, and fear that the future might be worse as a result of technological advances. In this study, I have argued that narrative forms become powerful rhetorical forces helping audiences to navigate the conflict between these competing perspectives and also to make sense of their own often-conflicting attitudes. In particular, I identified the Singularity, a moment in which artificial intelligence reaches and surpasses human, as one strain of discourse illustrating such conflicting themes. In this chapter, I both summarize that analysis and explain its implications for understanding the public's relationship to technology and the social function of narrative forms.

Summary

Science and technology have become the dominant discourses of this era. The increasing use of technical reasoning to understand the universe, a project beginning in the seventeenth century, has culminated in a technocratic discourse. Here, science, technology, and history become powerful vocabularies for engaging and describing everyday experiences. Yet, such discourse has proven ineffective at accounting for certain social or cultural crises. In particular, this type of reasoning lacks the ability to engage value-based issues, evaluate moral conflicts, or confront psychological crises (Rowland, 1990). For these problems, people often turn to myths.

Building on previous work regarding rhetorical myth (Rowland, 1990), I suggested that certain stories act as symbolic equipment (Burke, 1973), providing audiences with solutions to certain social or cultural crises not accounted for in technical, rational, or scientific discourses.

Additionally, I argued that some science fiction narratives can function in this way, inspiring fantastic visions of the future that shape contemporary decisions regarding technology.

Singularitarian rhetors, specifically, attempt to overcome cultural anxiety regarding technology by telling such stories. In particular, Singularitarians encourage audiences to look beyond their everyday experiences with technology in favor of a utopian vision of the future. Here, the fantastic possibilities of technology, illustrated in much Golden Age science fiction, become the probable outcomes of contemporary progress. To accomplish this, these rhetors emphasize the Singularity (and related technologies) as the next step in the long story of humanity. Such discourse situates the audience in an evolutionary narrative, challenging them to abandon traditional, linear notions of technological progress. In its place, Singularitarians offer the exponential pace of evolution as evidence for a rapidly approaching techno-utopia. The result of this narrative is transcendence, a technologically enhanced life free from the frailty of biology or the perils of war, disease, and the like.

Having established the rhetorical form and function of Singularitarian rhetoric, I then turned to its counterpart. Anti-Singularity discourse does not rely on mythic reasoning. Rather, it exhibits a form more closely related to what Milford (2010) describes as secondary allegory. This type of rhetoric offers audiences a variety of images, acting as pre-texts, from which they can symbolically extract meaning to make sense of their experiences. Particularly, anti-Singularity discourse relies heavily on historical examples of technology gone wrong, with an emphasis on the atomic bomb, and references to dystopian icons (the Terminator, the Borg, etc.). These examples and images, then, provide audiences with new (or perhaps different) meaning for technological advances. Thus, by symbolically aligning contemporary technology with

destructive or dystopian analogues, audience members are given reasons for pessimistic attitudes towards technology.

Thus, as a discourse, the Singularity is one example of the emergence of narrative forms to make sense of technological progress. Where technocratic reasoning fails to engage social and cultural anxieties about technology, audiences are offered competing stories about the future. Singularitarians construct a mythic narrative of evolution culminating in techno-transcendence. Alternatively, anti-Singularity discourse draws on a variety of examples and images to encourage pessimistic attitudes about technology. In the following section, then, I suggest some implications of this analysis regarding the public's relationship to technology and the changing role of narrative forms in a technological era.

Implications

This study offers two significant contributions regarding public discourse and technology. First, I suggest that technological anxiety is likely entrenched (if not caused) by inconsistent popular narratives about technology. Second, I argue that the influence of anti-Singularity discourse blurs traditional distinctions between myth and allegory.

The Public and Popular Accounts of Technology

The resonance of Singularitarian rhetoric demonstrates a social or cultural need to make sense of technology *and* the inability of relevant discourses to accomplish such an end. Vance (2010) notes, "The underlying premise of the Singularity responds to people's insecurity about the speed of social and technological change in the computer era" (para 38). Such anxiety might be explained by inconsistency in popular accounts of technology.

For example, audiences are bombarded by messages touting the ways that technology can positively influence their everyday lives. Simultaneously, dangerously advanced technology is

frequently portrayed as a villain in popular films, books, and video games. Yet, while there might be a large gap between smartphones and homicidal robots, there is little public discourse that focuses in a balanced way on the pluses and minuses of technological change. In fact, it is the failure of this kind of balanced technocratic reasoning to resonate that has created the space for the Singularity myth and also for its allegorical counterpart. As Barrat (2013) observes,

> Too few people know that we need to have an ongoing internal conversation about AGI [artificial general intelligence] comparable to those we have about nuclear weapons. Too many people think the frontiers of AI are delineated by harmless search engines, smart phones, and now Watson. But AGI is much closer to nuclear weapons than to video games. (p. 155)

Pro-Singularity advocates make similar arguments. Thus, the failure of technocratic reason to serve the needs of the audience creates the preconditions for the competing pro and anti-technology narratives and therefore the resulting public sense of disquiet.

Alternatively, audiences can turn to popular accounts of technological advances. Steve Jobs' famous presentations at Apple's WorldWide Developers Conference (WWDC), for example, commanded public attention and seemed to generate much public discussion of technological progress. But, these types of addresses often emphasize gadget lust, the "mystique and hype" (Sullivan, 2010, para 2) surrounding technology, rather than explaining the long-term implications of such advances. Similarly, Barrat (2013) notes, the "inconvenient facts of AI risk are not as sexy as techno-journalism's usual fare of dual core 3-D processors, capacitive touch screens, and the current hit app" (p. 26). Here, popular mediated accounts again forego educational or critical appraisals of technology in favor of trends and novelty. Consequently,

popular discussions of technology lack the explanatory power necessary to assuage cultural anxiety.

Thus, one implication of this study, then, is that the cacophony of available discourses for making sense of technology likely contributes to social or cultural anxiety about the future. Audiences are given reasons to be both hopeful and terrified of technological progress, but have few means for understanding the long-term implications of technology. As such, pro and anti-Singularity rhetoric, which illustrate the consequences of contemporary decisions about technology, helps fill in the gap to allow the public to process the potential of technological advances.

The Role of Narrative

This study is also important because it suggests significant implications related to the social or cultural function of narratives. In particular, while many scholars suggest that a key, functional distinction between myth and allegory is the degree to which audiences believe the narrative to be true, I contend that this study illustrates the increasing power of certain allegories to function at the level of myth.

Since Fisher's (1984) foundational work on narratives, much research has attempted to appropriately define a rhetorical approach to stories (Warnick, 1986; Rowland, 1987; Rowland, 1989). One theme emerging from this research is the need for productive ways for critics to delineate certain rhetorical forms from others. One method for accomplishing this is to tie together the function *and* form of the story. As Rowland (2014) notes, "the most profitable place to look for useful narratives is at the intersection of form and function" (p. 13).

For example, Rowland (1990) distinguishes between "myths that have to do with the serious matter of living life in terms of the order of society and of nature, and stories with some

of those same motifs that are told for entertainment" (p. 109). He highlights Tolkien's *Lord of the Rings* stories, which fulfill many of the formal elements of myths, but are not "presented as true" (p. 109) and therefore lack the ability to solve social or cultural problems not accounted for by other discourses. This suggests the importance of stories that both exhibit the formal characteristics of myths and function as "a reality lived" (Malinowski, 1948, p. 100), narratively reflecting the audience's situation.

The Singularity is one of these stories. The transcendent truth offered by Singularitarian rhetors requires a mythic form, although much of the supporting material is heavily rationalistic. The perfect future following the Singularity, however, is typical of myth. Audiences must be able to see their material conditions in the symbolic terms of the narrative to believe as true the fantastic possibilities offered by technology. For instance, the emphasis on evolution, which becomes a special time, and the future, a special place of existential transformation, provides audiences with new ways of seeing their contemporary situation. Thus, audience members embrace the story of techno-transcendence as more than the combination of plot, characters, and setting. The narrative provides them with new means for understanding their place in the universe and, most importantly, hope for a perfected future and immortality through technology.

On the other hand, anti-Singularity discourse exhibits a different narrative form and, as such, a distinct rhetorical function. First, these rhetors do not propose a transcendent end to technology. Rather, they suggest that technological progress is likely to yield death and destruction. To send this message, these rhetors draw on a variety of dystopian images and examples. Here, well-known science fiction stories and historical examples of technological disaster function as symbolic reservoirs, from which audiences can draw meaning.

Importantly, though, while myth and allegory are often treated as distinct narrative forms, I argue that this study suggests that any line between them may blur in some cases. In particular, I suggest that the prevalence of references to dystopian science fiction (the Terminator, HAL9000, etc.) in public discourse about the future demonstrates an increased reliance on allegorical narrative forms to convey social or cultural truths, a function often associated with myth. This is not to say that audience members embrace the story of the Terminator as they embrace the story of the Bible, but rather that they use it understand the potential impact of technology on civilization. In this way, certain allegories about technology function like myths in providing a worldview.

Allegory is often used to tap into an underlying mythic system. Christian allegories of the Bible are one obvious example. That is not what is happening in anti-Singularity discourse. Rather, the allegories tap into stories that are not mythic in function/formal terms because the audience knows them to be science fiction, but some in the audience treat these fictional stories as serious representatives of a possible futre, thus blurring the line between allegory and myth.

One explanation for this possible change is the increasing ubiquity of technology and science fiction about it. As audiences become more reliant on, and simultaneously skeptical of, technology, some of the themes of dystopian science fiction seem like true accounts of a possible future. While people have not experienced self-aware, malicious robots, they do have phones that talk to them and the imminent promise of self-driving vehicles. Images of combat-ready robots flood the Internet, and stories of military drones have garnered significant media attention. In this way, the conditions of the present seem to suggest the possibility that dystopian stories depict the near future.

Thus, another implication of this study is that, in certain circumstances, dystopian allegories of technology and the future function in a way similar to traditional sacred myth. Audiences embrace these narratives as true because they seem to reflect the material conditions of technological progress and, as such, provide guidance in times of uncertainty.

Conclusion

In this study, I have illuminated the form and function of pro and anti-Singularity discourse. In doing so, I suggested that where technocratic discourse fails at accounting for social and cultural anxiety about technology, narrative forms become powerful resources for audiences. Pro- Singularity discourse, which exhibits the form and function of a utopian myth, offers audience members a path to transcendence through the fantastic possibilities of technology. Alternatively, anti-Singularity discourse, as a secondary allegory, encourages audiences to extract themes from historical and dystopian examples to form pessimistic attitudes towards technological progress.

Additionally, this analysis has two significant implications regarding the public's relationship to technology and the changing cultural role of narrative forms. In particular, I argued that inconsistent accounts of technology in various relevant discourses have contributed to technological anxiety, and encouraged audiences to seek alternative means of making sense of the future. Then, I illustrated the increasing cultural power of certain allegorical forms, which can function at the level of myth by tying audience's contemporary experiences with technology to dystopian science fiction narratives.

References

Allen, P., & Greaves, M. (2011). *Paul Allen: The Singularity isn't near*. Retrieved from http://www.technologyreview.com/view/425733/paul-allen-the-singularity-isnt-near/

Ammori, M. (2011). *The Singularity…and government in the future.* Retrieved from http://www.huffingtonpost.com/marvin-ammori/the-singularity-and-gover_b_1006573.html

Anthony, S. (2013, October 4). *Meet DARPA's WildCat: A free-running quadruped robot that will soon reach 50 mph over rough terrain*. Retrieved from http://www.extremetech.com/extreme/168008-meet-darpas-wildcat-a-free-running-quadruped-robot-that-will-soon-reach-50-mph-over-rough-terrain

Anissimov, M. (2010, January 4). *Criticisms of the Singularity*. Retrieved from http://www.good.is/posts/criticisms-of-the-singularity

Asimov, I. (1991). *The caves of steel*. New York, NY: Bantam Books.

Associated Press (2014, January 3). Most Americans have a gloomy outlook for life in 2050. *PBS News Hour*. Retrieved from http://www.pbs.org/newshour/rundown/2014/01/most-americans-have-a-gloomy-outlook-for-life-in-2050.html

Barrat, J. (2013). *Our final invention: Artificial intelligence and the end of the human era*. New York, NY: St. Martin's Press.

Barrett, W. (1972). *Time of need: Forms of imagination in the twentieth century*. New York, NY: Harper and Row.

Barrett, W. (1979). *The illusion of technique*. Garden City, NY: Anchor Press/Doubleday.

Barrett, W. (1987). *Death of the soul: From Descartes to the computer*. Garden City, NY: Anchor Press.

"Bill Joy." (2014). Retrieved from http://www.computerhistory.org/fellowawards/hall/bios/Bill,Joy/

Braine, F.S. (1994). Technological utopias: The future of the next generation. *Film & History, 224(1-2)*, 2-18.

Brooks, R. (2008, 01 June). *I, Rodney Brooks, am a robot: A powerful artificial intelligence won't spring from a sudden technological "big bang"—it's already evolving symbiotically with us*. Retrieved from http://spectrum.ieee.org/computing/hardware/i-rodney-brooks-am-a-robot

Bruns, G. (1988). The hermeneutics of allegory and the history of interpretation. *Comparative Literature, 40,* 384-395.

Burke, K. (1969). *A rhetoric of motives*. Berkeley, CA: University of California Press.

Burke, K. (1971). Doing and saying: Thoughts on myth, cult, and archetypes. *Salmagundi, 15*, 100-119.

Burke, K. (1973). *The philosophy of literary form*. Los Angeles, CA: University of California Press.

Burke, K. (1984). *Attitudes toward history*. Berkeley, CA: University of California Press.

Cadwalladr, C. (2014, February 22). *Are the robots about to rise? Google's new director of engineering thinks so*. Retrieved from http://www.theguardian.com/technology/2014/feb/22/robots-google-ray-kurzweil-terminator-singularity-artificial-intelligence

Campbell, J. (1988). *The power of myth*. New York, NY: Random House.

Campbell, K. K., & Huxman, S. S. (2003). *The rhetorical act: Thinking, speaking, and writing critically*. Belmont, CA: Wadsworth Cengage Learning.

Capek, K. (2014). *R.U.R.* Lexington, KY: Wildside Press.

Cassirer, E. (1970). *An essay on man*. New Haven, CT: Yale University Press.

Chalmers, D. J. (2010). The Singularity: A philosophical analysis. *Journal of Consciousness Studies, 17*, 7-65.

Clarke, A.C. (1964). *Profiles of the future*. UK: Pan Books.

Clarke, A.C. (1982). *2001: A space odyssey*. New York, NY: Penguin Books.

Covino, W. A. (1996). Grammars of transgression: Golems, cyborgs, and mutants. *Rhetoric Review, 14(2)*, 355-373.

Davis, J. (Producer), Dow, T. (Producer), Godfrey, W. (Producer), & Proyas, A. (Director). (2004). *I, Robot* [Motion picture]. USA: Davis Entertainment.

Deeley, M. (Producer), & Scott, R. (Director). (1982). *Blade Runner* [Motion picture]. USA: The Ladd Company.

Dick, P.K. (1968). *Do androids dream of electric sheep?* New York, NY: Random House.

Doll, S., & Faller, G. (1986). Blade Runner and genre: Film noir and science fiction. *Literature Film Quarterly, 14 (2)*, 89-101.

Doty, W.G. (2004). Doty, W.G. (2004). *Myth: A handbook.* Westport, CT: Greenwood Press.

Esget, B. (2014). *Ray Kurzweil interview with the Singularity Hub*. Retrieved from http://www.outsider-trading.com/ray-kurzweil-interview-with-the-singularity-hub/

Fisher, W. R. (1984). Narration as a human communication paradigm: The case of public moral argument. *Communication Monographs, 51*, 1-22.

Fletcher, A.J.S. (2006). Allegory without ideas. *Boundary 2(33)*, 77-98.

Frentz, T.S. (1985). Rhetorical conversation, time, and moral action. *The Quarterly Journal of Speech, 71(1)*, 1-18.

Gannes, L., & Temple, J. (2014, January 27). *More on DeepMind: AI startup to work directly with Google's search team*. Retrieved from http://recode.net/2014/01/27/more-on-deepmind-ai-startup-to-work-directly-with-googles-search-team/

Gehmann, U. (2003). Modern myths. *Culture and Organization, 9(2)*, 105-119.

Good, I. J. (1964). *Speculations concerning the first ultraintelligent machine*. Retrieved from http://commonsenseatheism.com/wp-content/uploads/2011/02/Good-Speculations-Concerning-the-First-Ultraintelligent-Machine.pdf

Grossman, L. (2011, February 10). 2045: The year man becomes immortal. *TIME*. Retrieved from http://www.time.com/time/health/article/0,8599,2048138-1,00.html

Hanson, R. (2008, June 01). *Economics of the Singularity: Stuffed into skyscrapers by the billion, brainy bugbots will be the knowledge workers of the future.* Retrieved from http://spectrum.ieee.org/robotics/robotics-software/economics-of-the-singularity

Hariman, R. (2002). Allegory and democratic public culture in the postmodern era. *Philosophy and Rhetoric, 35 (4)*, 267-296.

Heinlein, R. (2004). *For us, the living: A comedy of customs*. New York, NY: Pocket Books.

Hill, D. (2013). *Exclusive interview: Ray Kurzweil discusses his first two months at Google*. Retrieved from http://singularityhub.com/2013/03/19/exclusive-interview-ray-kurzweil-discusses-his-first-two-months-at-google/

Horgan, J. (2008, June 1). *The consciousness conundrum*. Retrieved from http://spectrum.ieee.org/biomedical/imaging/the-consciousness-conundrum

Horkova, J., & Kelemen, J. (no date). *Capek, Turing, von Neumann, and the 20th century evolution of the concept of machines*. Retrieved from http://uni-obuda.hu/conferences/Neumann/Kelemen.pdf

Hurd, G. A. (Producer), & Cameron, J. (Director). (1984). *The Terminator* [Motion picture]. USA: Orion Pictures.

"Isaac Asimov's 'Three Laws of Robotics.'" (2001). Retrieved from http://www.auburn.edu/~vestmon/robotics.html

Joy, B. (2000, April). *Why the future doesn't need us.* Retrieved from http://archive.wired.com/wired/archive/8.04/joy.html

Kelley-Romano, S. (2006). Mythmaking in alien abduction narratives. *Communication Quarterly, 54(3)*, 383-406.

King, C. (2011, February 22). IBM's Watson finds "Jeopardy" elementary. *Ecommerce Times*. Retrieved from http://www.ecommercetimes.com/story/IBMs-Watson-Finds-Jeopardy-Elementary-71915.html?wlc=1304447624

Knight, W. (2013). *Ray Kurzweil plans to create a mind at Google—and have it serve you.* Retrieved from http://www.technologyreview.com/view/510121/ray-kurzweil-plans-to-create-a-mind-at-google-and-have-it-serve-you/

Koven, M. J. (2000). "Have I got a monster for you!": Some thoughts on the Golem, "The X-Files" and the Jewish horror movie. *Folklore, 111(2)*, 217-230.

Kurzweil, R. (1999). *The age of spiritual machines: When computers exceed human intelligence.* New York, NY: Penguin Books.

Kurzweil, R. (2005). *The Singularity is near: When humans transcend biology.* New York, NY: Penguin Books.

Kushner, D. (2009, February 19). When man & machine merge. *Rolling Stone*.

Lee, C., Scheufele, D. A., & Lewenstein, B. V. (2005). Public attitudes toward emerging

technologies: Examining the interactive effects of cognitions and affect on public attitudes towards nanotechnology. *Science Communication, 27*, 240-267.

Levitas, R. (2007). Looking for the blue: The necessity of utopia. *Journal of Political Ideologies, 12(3)*, 289-306.

Malinowski, B. (1948). *Magic, science and religion and other essays*. Garden City, NY: Doubleday.

Manuel, F.E. (1965). Toward a psychological history of utopias. *Daedalus, 94(2)*, 293-322.

Markoff, J. (2011, February 16). Computer wins on "Jeopardy!": Trivial, it's not. *The New York Times*. Retrieved from http://www.nytimes.com/2011/02/17/science/17jeopardywatson.html?_r=2&pagewanted=1

Mason, H. (1980). Myth as an "Ambush of Reality." In A. M. Olson (Ed.), *Myth, Symbol, and Reality*, (15-19). Notre Dame, IN: University of Notre Dame Press.

McKenna, B.J., & Graham, P. (2000). Technocratic discourse: A primer. *Journal of Technical Writing and Communication, 30(3)*, p. 223-251.

Messerly, J. G. (2011). *I'm glad the future doesn't need us: A critique of Joy's pessimistic futurism.* Retrieved from http://commonsenseatheism.com/wp-content/uploads/2011/03/Messerly-Im-glad-the-future-doesnt-need-us.pdf

Milford, M. (2010). Neo-Christ: Jesus, *The Matrix*, and secondary allegory as a rhetorical form. *Southern Communication Journal, 75 (1)*, 17-34.

Milford, M., & Rowland, R.C. (2012). Situated ideological allegory and *Battlestar Galactica*. *Western Journal of Communication, 76(5)*, 536-551.

Miller, C.A., & Bennett, I. (2008). Thinking longer term about technology: Is there value

in science fiction-inspired approaches to constructing futures? *Science and Public Policy, 35 (8)*, 597-606.

Miller, J. D. (2012). *Singularity rising: Surviving and thriving in a smarter, richer, and more dangerous world.* Dallas, TX. BenBella Books.

Milner, A. (2012, August 30). Science fiction and dystopia: What's the connection? Retrieved from http://theconversation.edu.au/science-fiction-and-dystopia-whats-the-connection-8586.

Molnar, T. (1967). *Utopia: The perennial heresy*. New York, NY: Sheed and Ward.

Moravec, H. (1988). *Mind children: The future of robot and human intelligence*. Cambridge, MA: Harvard University Press.

Moravec, H. (1999). *Robot: Mere machine to transcendent mind*. New York, NY: Oxford University Press.

National Science Foundation. (2012). Public attitudes about specific S&T-related issues. Retrieved from http://www.nsf.gov/statistics/seind12/c7/c7s4.htm.

Nelson, J.S. (Eds.). (1989). Political mythmaking for post-moderns. Proceedings from Alta, *National Communication Association/American Forensic Association*, 175-183.

Nordmann, A. (2008). *Singular simplicity: The story of the Singularity is sweeping, dramatic, simple—and wrong*. Retrieved from http://spectrum.ieee.org/robotics/robotics-software/singular-simplicity

O'Leary, S.D. (1994). *Arguing the apocalypse: A theory of millennial rhetoric*. New York, NY: Oxford University Press.

O'Leary, S.D. (1997). Argument and the anticipation of catastrophe: The prediction of

risk and the risks of prediction. *Argumentation, 11*, 293-313.

Paul, I. (2011, February 17). IBM Watson wins Jeopardy, humans rally back. *PCWorld*. Retrieved from http://www.pcworld.com/article/219900/ibm_watson_wins_jeopardy_humans_rally_back.html

Paul, I. (2013, April 3). *The end of Moore's Law is on the horizon, says AMD*. Retrieved from http://www.pcworld.com/article/2032913/the-end-of-moores-law-is-on-the-horizon-says-amd.html

Pensky, N. (2014, February 3). *Ray Kurzweil is wrong: The Singularity is not near*. Retrieved from http://pando.com/2014/02/03/the-singularity-is-not-near/

Pew Research Center (2010). Tech times: Media coverage of technology. Retrieved from http://pewresearch.org/pubs/1742/technology-news-mainstream-media-blogs-twitter-apple-google.

Phair, K. (2010). *The gospel according to*: A theory of transformative discursive allegory. *Communication Studies, 61 (1)*, 104-117.

Popper, B. (2012, October 22). *Rapture of the nerds: will the Singularity turn us into gods or end the human race*. Retrieved from http://www.theverge.com/2012/10/22/3535518/singularity-rapture-of-the-nerds-gods-end-human-race

Portolano, M. (2012). The rhetorical function of utopia: An exploration of the concept of utopia in rhetorical theory. *Utopian Studies, 23(1)*, 113-14

Procter, D.E. (1992). Bridging social change through mythic regeneration. *Communication Studies, 43(3)*, 171-181.

Rabkin, E.S. (2004). Science fiction and the future of criticism. *PMLA, 119 (3)*, 457-473.

Renegar, V.R., & Dionisopoulos, G.N. (2011). The dream of a cyberpunk future? Entelechy, dialectical tension, and the comic corrective in William Gibson's *Neuromancer*. *Southern Communication Journal, 76 (4)*, 323-341.

Rowland, R. C. (1987). Narrative: Mode of discourse paradigm. *Communication Monographs, 54*, 264-275.

Rowland, R. C. (1989). On limiting the narrative paradigm: Three case studies. *Communication Monographs, 56*, 40-53.

Rowland, R. (1990). On mythic criticism. *Communication Studies, 41(2)*, 101-116.

Rowland, R. C. (2014). *The relationship between narrative function and narrative form: The utility of a non-paradigmatic approach to narrative*. Unpublished manuscript, Department of Communication Studies, University of Kansas, Lawrence, Kansas.

Rowland, R. C., & Frank, D. A. (2011). Mythic rhetoric and rectification in the Israeli-Palestinian conflict. *Communication Studies, 62(1)*, 41-57.

Rushing, J.H. (1985). E.T. as rhetorical transcendence. *Quarterly Journal of Speech,71(2)*, 188-203.

Rushing, J.H. (1986). Mythic evolution of the "New Frontier" in mass mediated rhetoric. *Critical Studies in Mass Communication, 3*, 265-296.

Rushing, J.H., & Frentz, T.S. (1989). The Frankenstein myth in contemporary cinema. *Critical Studies in Mass Communication, 6*, 61-80.

Saenz, A. (2010a, August 19). *When will computers match the human brain? Kurzweil vs. Myers*. Retrieved from http://singularityhub.com/2010/08/19/when-will-computers-match-the-human-brain-kurzweil-vs-myers/

Saenz, A. (2010b, January 19). *Kurzweil defends predictions for 2009, says he is 102 for 108.* Retrieved from http://singularityhub.com/2010/01/19/kurzweil-defends-predictions-for-2009-says-he-is-102-for-108/.

Salvador, M. (1992). Technocratic discourse and the rhetorical constraint of local knowledge. *Western Journal of Communication, 56*, p. 18-36.

Sargent, L.T. (1994). The three faces of utopianism revisited. *Utopian Studies*, *5(1)*, 1-38.

Satell, G. (2013a). *Should we fear the rise of the robots?* Retrieved from https://sreaves32.wordpress.com/2013/05/page/59/

Satell, G. (2013b). *The Singularity: Apocalypse or nerd rapture?* Retrieved from http://www.digitaltonto.com/2013/the-singularity-apocalypse-or-nerd-rapture/

Silver, J. (Producer), Wachowski, A. (Director), & Wachowski, L. (Director). (1999). *The Matrix* [Motion picture]. USA: Village Roadshow Pictures.

Sullivan, M. (2010). *Don't be blinded by gadget lust*. Retrieved from http://www.techhive.com/article/205668/bling.html

Tally, S. (2012, February 19). *One and done: Single-atom transistor is end of Moore's Law; may be beginning of quantum computing.* Retrieved from http://www.purdue.edu/newsroom/research/2012/120219KlimeckAtom.html

Telotte, J.P. (1993). The world of tomorrow and the 'secret goal' of science fiction. *Journal of Film and Video, 45 (1)*, 27-39.

The technological citizen: Ethical reflections on modern technology. (2010, February 16). *Immortality, transhumanism, and Ray Kurzweil's Singularity*. Retrieved from http://thetechnologicalcitizen.com/?p=2197

Tiku, N. (2012). *Faith, hope, and Singularity: Entering the Matrix with New York's futurist set*.

Retrieved from http://betabeat.com/2012/07/singularity-institute-less-wrong-peter-thiel-eliezer-yudkowsky-ray-kurzweil-harry-potter-methods-of-rationality/

Vance, A. (2010, June 12). *Merely human? That's so yesterday*. Retrieved from http://www.nytimes.com/2010/06/13/business/13sing.html?pagewanted=all&_r=0

Vignoli, T. (1978). *Myth and Science*. New York, NY: D. Appleton and Company.

Vinge, V. (1993). *The coming technological singularity: How to survive in the post-human era*. Retrieved from https://docs.google.com/file/d/0B-5-JeCa2Z7hN1RfRDlqcXpVYzA/edit

Vinge, V. (2008, June 01). *Signs of the Singularity: Hints of the singularity's approach can be found in the arguments of its critics*. Retrieved from http://spectrum.ieee.org/biomedical/ethics/signs-of-the-singularity

Waardenburg, J. (1980). Symbolic aspects of myth. In A. M. Olson (Ed.), *Myth, Symbol, and Reality*, (41-68). Notre Dame, IN: University of Notre Dame Press.

Wagner, W., Kronberger, N., & Seifert, F. (2002). Collective symbolic coping with new technology: Knowledge, images and public discourse. *British Journal of Social Psychology, 41(3)*, 323-354.

Warnick, B. (1986). The narrative paradigm: Another story. *Quarterly Journal of Speech, 72*, 290-305.

"Watson and our superiority complex". (2011). Retrieved from http://www.economist.com/blogs/democracyinamerica/2011/02/jeopardy_and_ib

Wolchover, N. (2012, September 10). *What is the future of computers?* Retrieved from http://www.livescience.com/23074-future-computers.html

Yudkowsky, E. (2008). Artificial intelligence as a positive and negative factor in global risk. In

N. Bostrom & M. M. Cirkovic (Eds.), *Global Catastrophic Risks* (308-345). New York; Oxford University Press.