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THE IMPACT OF EMERGENT TECHNOLOGIES ON
INTERPERSONAL AND COMMUNITY INTERACTION OF THE FUTURE:
A THEMATIC ANALYSIS OF SELECTED NOVELS OF
WILLIAM GIBSON AND VERNOR VINGE

A Dissertation Presented
To

The Faculty of the School of Education
Department of Leadership Studies
Organization and Leadership Program

In Partial Fulfillment
of the Requirements for the Degree
Doctor of Education

by
Lyn Motai
San Francisco
May 2011

University of San Francisco
Dissertation Abstract

The Impact of Emergent Technologies on Interpersonal and Community Interaction of
the Future: A Thematic Analysis of Selected Novels
of William Gibson and Vernor Vinge

The purpose of the study was to examine potential changes, generated by

technology, in future interpersonal and community interaction. Insights into future social

realities were sought through analysis of the literature of speculative fiction involved a

thematic analysis of Vinge's *True Names* (2001) and *Rainbows End* (2006), and Gibson's

Neuromancer (2000) and *All Tomorrow's Parties* (1999). The continuous change in

present-time modes and mores of social interaction engendered by new technologies

raised questions about how the concept of human connectedness would change, if at all,

in societies of the near future, and of whether the changes would benefit or threaten the

viability of society. Because the potential for harmonious and collaborative interaction is

one measure of sustainability in both interpersonal and community relations, it was

thought that an examination of technology-created change in the future would provoke

gainful reflection upon the ways in which technological development best served the

complex, interdependent, and emergent world that human beings inhabit.

The research method involved a thematic analysis of the novels under study.

Criteria for the novels' inclusion encompassed their relevance to future technology-

generated communication and their applicability to the research questions of the study.

Societies depicted in the novels were further examined for their integration of the

principles of complexity science, utilizing Goerner's (1999) model of a future,

complexity-based Dynamic Web World as a point of comparison. Six themes recurred in

each of the novels: (a) the technology-enabled autonomy of the individual to create an

alternate persona; (b) the re-definition of place and community; (c) the advent of technology as a force in social equality; (d) the distrust of government and corporate stewardship; (e) the enduring values of family, friendship, and love; and (f) the dawn of self-aware Artificial Intelligence, bringing with it consequences potentially beyond human control or comprehension. Conclusions indicated that, in the societies analyzed, technology was both the cause and mechanism of changing definitions of reality, community, and place; that the societies exhibited both adaptation and non-adaptation to new technologies; that the importance of real-world relationships endured; and that the advent of self-aware AI was on the near horizon.

This dissertation, written under the direction of the candidate's dissertation committee and approved by the members of the committee, has been presented to and accepted by the Faculty of the School of Education in partial fulfillment of the requirements for the degree of Doctor of Education. The contents and research methodologies presented in this work represent the work of the candidate alone.

Lyn Motai   May 18, 2011
Candidate   Date

Dissertation Committee

Dr. Patricia Mitchell, Chairperson   May 18, 2011
                                                                                          Date

Dr. Gini Shimabukuro   May 18, 2011
                                                                                          Date

Dr. Richard W. Stackman   May 18, 2011
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CHAPTER I: THE RESEARCH PROBLEM

Statement of the Problem

> Our problem is that, literally, we cannot imagine the future. The pace of technological change is so great that, literally, we cannot know what type of world we are leaving for our children. If we plant acorns, we cannot reasonably expect that our children will sit under the oak trees. Or that they will even want to. The world is changing too fast for that . . . so, what are we humans becoming? Whatever it is more connected, more interdependent. Few individuals today could survive outside the fabric of society. (Hillis, 2001, pp. 30-31)

The change brought about by the rapid and continuous introduction of new technologies into society is exponential rather than linear; "few observers have truly internalized the implications of the fact that the rate of change itself is accelerating" (Kurzweil, 2006, p. 39). Prediction of the effects of this accelerating change is one of the ways in which humans try to understand the outcomes for society, be they utopian, dystopian, or neither, particularly upon individuals and the communities in which they interact (Christakis & Fowler, 2009). Future prediction can have both moral and social functions, bridging the gap between change and foreknowledge (de Jouvenel, 1967). Research into the social, economic, and political realities of today and the technologies that influence them is one mode of prediction. Another picture of the future may be framed through analysis of the literature of speculative fiction, a genre that extrapolates from today what might be in a near or far tomorrow.

As Goertzel (2006) asserted, human society is in a transitional period; technology will transform humans culturally, psychologically, and physically. Human history is, in fact, generally portrayed as one of change, evolution, and innovation; there has been nothing that did not incrementally change over time (Kelly, 1994). What may be noteworthy about the early 21st century as a transitional period, however, is that, because

of the speed of change, "change is becoming the defining feature of the present . . . assumption that the future will be different from the present has become outdated. Today the present is different from the present" (Hollinger, 2006, p. 465), suggesting that humans are feeling less at ease in the time in which they live. Goerner (2002) asserted that humans are, in fact, "already in the midst of a major cultural restructuring that may . . . represent the birth pangs of a new, more complex form of civilization" (p. 242).

Concern has been voiced about whether the advent of rapid advances in new technologies will work for the benefit or to the detriment of interpersonal and community interaction and the social networks, or groups of interconnected individuals (Christakis & Fowler, 2009), through which these develop. Rheingold (2002), in *Smart Mobs*, noted that "the same convergence of technologies that opens new vistas of cooperation also makes possible a universal surveillance economy and empowers the bloodthirsty as well as the altruistic" (p. xviii). Arguments in support of both eventualities, as well as a middle ground, have been advanced.

<div align="center">Purpose of the Study</div>

The purpose of the study was to examine potential changes, motivated by technology, in future interpersonal and community interaction. Insights into future social realities were sought through analysis of the literature of speculative fiction. The study, framed in the principles of complexity science, involved a thematic analysis of Vernor Vinge's *True Names* (2001) and *Rainbows End* (2006), and William Gibson's *Neuromancer* (2000) and *All Tomorrow's Parties* (1999). The profound and continuous change in present-time modes and mores of social interaction engendered by new technologies raised questions about how the concept of human connectedness would

change, if at all, in future society, and of whether changes would benefit or threaten the viability of society. Because the potential for harmonious and collaborative interaction was one measure of sustainability in both interpersonal and community relations, it was thought that an examination of technology-created change in the future might provoke gainful reflection upon the ways in which its development best served the complex, interdependent, and emergent world that human beings inhabit.

The novels are contemporary postmodernist, which was defined in this study as spanning the years between 1970 and the present (McHale, 2008), and associated with a speculative fiction subgenre called *cyberpunk.* The cyberpunk subgenre—*cyber* relating to cybernetics, specifically artificial intelligence; *punk* delineating an edgy attitude of high-spirited and optimistic rebelliousness or, more frequently, of distrust and disillusionment with the established social order—has found its focus in the social implications of the development of information, communication, and biotechnologies (Clute & Nichols, 1995). The novels were examined for the purpose of recording, analyzing, and synthesizing themes that emerged in relation to the future impact of technology on interpersonal and community interaction.

Background and Need

Speculative Fiction as it Reflects the Past and Future

The stories of speculative fiction literature occur in the future, which means that they extrapolate both from history and from current social reality to imagine what might be (Dern, 2008). The need to ground the imaginative "what if" of speculative fiction stories in what has been and what is now has made it a particularly powerful channel through which to reflect upon the state of interpersonal and community interaction in the

current society. Goerner (1999) noted that "we need a new story, but we have a hard time seeing past the one which dominates now" (p. 98). Writers of speculative fiction, as creators of all manner of new stories of the human condition, have provided a mirror of the present and a window into the future for those who wished to look at and understand what they were being shown.

Why look to the genre of speculative fiction for insight into the real-world future? Some of the definitions of the genre put forward by speculative fiction writers have demonstrated its suitability. Gunn (2002), writer and science fiction historian, defined speculative fiction as

> . . . the branch of literature that deals with the effects of change on people in the real world as it can be projected into the past, the future, or to distant places . . . It often concerns itself with scientific or technological change, and it usually involves matters whose importance is greater than the individual or the community; often civilization or the race itself is in danger. (p. vii)

Dinello (2005) asserted that the most significant speculative fiction has extrapolated from existing realities and technological development to present visions of the future by which humans could assess present technology and reflect upon the direction in which it was taking humanity. Stross (2008), a biomedical and computer scientist and speculative fiction writer, contrasted the wide scope of speculative fiction and that of mainstream literature, noting that by focusing on interior vistas, mainstream fiction has ignored current developments having major effects on the lives of humans.

Speculative fiction has become, in fact, a genre through which our current culture can be fully understood. Jenkins (2003) posited that most cultures remembered their traditions and hand down values through storytelling about their pasts, and yet in the midst of the 20th century humans began to examine their deepest values and questions

through an exploration of the future. Authors Kelly and Kessel (2007), writing in the cyberpunk and post-cyberpunk subgenre of speculative fiction, which most often considered future scenarios of invasive biological, information, and communication technology, noted that much speculative fiction is cautionary in nature and is written in the belief that humans have control over future technological development. Cyberpunk and post-cyberpunk ideology asserted that technology was, in fact, changing more than the landscape of society; it was changing what it meant to be human. Cyberpunk and post-cyberpunk speculative fiction reflected principles of complexity science which depicted the world as a web of dynamic interconnections and complex causality (Goerner, 1999). "Human values are not imprinted on the fabric of the universe because what it means to be human is always negotiable" (Kelly & Kessel, p. xi). Speculative fiction, then, written as it frequently was by scientists creating as well as reflecting upon both the theory and delivery of new technology, seemed a suitable genre through which to gather information about the directions humans may take or be taken in by new technologies.

The current and real world, then, has formed the basis of extrapolation to the future in speculative fiction and, in this study, provided the basis for an analysis of change from the past and present to the future. It is important, therefore, to examine today's society to reflect upon the influences of technology on what had been considered consensus community values (Kelly & Kessel, 2007).

Current Social Constructs and the Influences of Technology

The Characteristics of Social Networks

This study investigated the potential influences of technology on the ways in which humans communicate interpersonally and as part of communities, and it was therefore beneficial to examine some of the characteristics of the current technology-enabled social networks through which humans interact. In the book, *Connected: The Surprising Power of Our Social Networks and How They Shape Our Lives*, authors Christakis and Fowler (2009) reported on the ways in which social networks have influenced diverse aspects of our lives. They outlined the characteristics of human social networks, which they termed "human superorganisms" (p. 289), noting that human social networks behaved in ways similar to all biological organisms. A salient feature of social networks, according to Christakis and Fowler, is that they remain integrated and functional, independent of individual members; that they have, in fact, "a life of their own" (p. 289), maintaining a memory of their own structures.

Christakis and Fowler (2009) further described social networks as possessing a collective intelligence which enhances the intelligence of individuals within the group, an intelligence that "captures and contains information that is transmitted across people and time" (p. 290). They noted that social networks are capable of replicating themselves: "If every person [within a social network] has a memory of whom he or she is connected to, we can cut the connections and move all the people . . . and the network will reappear" (p. 291) as long as people remember and reconnect with their own social connections. Social networks, according to the authors, self-reinforce and heal themselves; the authors gave as an example the way in which the skin around a wound comes together and closes

up. This characteristic of a human social network indicated, according to Christakis and Fowler, that social networks are designed to survive over time. They contended that, because of the increasing connectedness of humans, made possible by continuous advances in information and communication technologies, "the ability of networks to create and sustain our collective goals continues to strengthen" (p. 292). Commenting on online social networks, they proposed that, while these networks are complex and abstract, they yet reflect the core human tendency to connect.

Two Views of Future Social Interaction in Consequence of Technology

Negroponte (1995) advanced the idea, 15 years ago and before the widespread availability of wireless mobile communication, that computing was no longer about computers but rather about life itself. From his perspective at the time, he foresaw that the values of the large nation-states would change as they were applied to electronic communities of varying sizes, and that place and time would come to have new meanings in the digitized social communities of the future. More recently, Rheingold (2002) similarly reflected upon current changes in the concept of community. Focusing particularly on mobile communications via wireless technology, he stressed the importance of contemplation upon the social impact of technology. Rheingold noted that, similar to the way that concepts of community were challenged by interactive networks in cyberspace, the home of the Internet, traditional ideas about the nature of place, one definer of community, were being challenged as mobile communication devices changed the nature of public space and social geography. Rheingold advocated, therefore, for the examination of the issues and implications involved in these new technologies and for creative ways of considering them. Niedzviecki (2009) mirrored Rheingold's concerns

when he observed that "Television changed society forever, but while it was happening it was hard to notice . . . we were too transfixed by what TV was showing as opposed to doing" (p.2).

Christakis and Fowler (2009) took a long-term view of the effects of new technologies in pointing out that each new technological invention, from "church bells and radios" to "Twitter and Facebook" (p. 256)—online social networking sites—had led to debate about its effects on humans' sense of community. They characterized the current stances of those on each side of the debate:

> Pessimists have expressed the concern that new ways of communicating might weaken traditional ways of relating, leading people to turn away from a full range of in-person interactions that, in bygone eras, were necessary and normal parts of life. Optimists argue that such technologies merely augment, extend, and supplement the conventional ways people form connections. (p. 256)

It is therefore useful in considering the impact of technology on interpersonal interaction and community relationships to examine the two sides of this issue.

Negative Influences on Future Social Interaction in Consequence of Technology

Based on the researcher's examination of the literature, which dealt with the existing and potential effects of technology on society, four themes emerged that reflected major concerns about technology's detrimental influence upon interpersonal and community nurturance: (a) the loss of expressive abilities, personal interaction, and community connection; (b) ethical and social concerns around biotechnology's potentials; (c) the power of surveillance technology to create fearful, over-controlled dystopias; and, finally, (d) the issue of posthumanism, in which artificially intelligent machines (AI) might gain ascendance over humans, reordering human values in ways detrimental to survival of the species.

One concern with the possible impact on positive community interaction focused on rapidly expanding communications technology, including software applications, such as Facebook, and mobile telephone capabilities. Rifkin (2008), an economist and futurist, wrote about the concern, based on recent studies in education, which showed that, while humanity was connecting itself ever more closely electronically, knowledge of the vocabulary necessary for clear self-expression was declining precipitously. Further, Rifkin expressed concern that emotional attachments might decline as a result of diminishing face-to-face communication, brought about by increasing amounts of time spent plugged into electronically created environments, leaving the next generations lonely and disconnected. These concerns, he posited, could herald the advent of individuals isolated from rather than connected within communities. Further, the technology of virtual reality, as in Second Life, (secondlife. com), an online, simulated world built by its participants, in which they can "connect, shop, work, love, explore and be different" could be seen as holding the threat of a population believing that "technology provides the scientific stairway to an electronic escape" from the challenges of the physically real world (Dinello, 2005, p. 5).

The advancing potential of biotechnology to alter humans both physically and mentally has been an area of concern, raising the fear that, in the view of social and political philosopher Fukuyama (2002), a burden would be placed on those who, for economic or philosophic reasons, could not compete. Fukuyama added that "what is at stake with biotechnology is not just some utilitarian cost-benefit calculus concerning future medical technologies, but the very grounding of the human moral sense, which has been a constant ever since there were human beings" (p. 127). As our current concept of

community is built around common bonds, changes in the moral order that bonds humans together could call into question the survival of the community concept.

Surveillance technology, currently pervasive and becoming more so as a result of rapidly advancing capabilities, could be seen as detrimental by those with reservations about the ways in which new technologies will be used. Brin (1998), in *The Transparent Society: Will Technology Force Us to Choose Between Privacy and Freedom?*, noted the ubiquity of surveillance currently in use both by private and governmental institutions. Examples included spying in the workplace, commercialization of personal information, credit reports, and tracking. He also noted that many new devices were being developed and tested, such as spy drones and radio-frequency identification implants. He postulated that surveillance devices and practices could be seen as obvious burdens on trust in communities, between individuals and community officials, as well as blocks to cohesiveness and cooperative coexistence of community members. Although largely seeing the positive uses of surveillance, Brin acknowledged the pitfalls in the case that information was not transparent to all.

A final theme in the arguments suggesting negative effects on community and interpersonal interaction was that the development of artificial intelligence and the posthuman era, in which machines, human-enabled with more-than-human intelligence, would take the power of control out of the hands of their creators. Dinello (2005) noted that the swift development of posthuman technologies "will have profoundly disturbing, perhaps revolutionary, effects on our world" (p. 274). Dinello predicted that in the advent of the posthuman stage of civilization, communities and societies would be required to face new, unknown realities. Implicit in this prediction was the concept that interpersonal

and community-level interaction would undergo profound and unforeseeable changes. Finally, Pontin (2005) contended that technology serves humans best when it stays within the scope of what was human, thereby offering the potential for expansion of happiness in our current lives.

Positive Influences on Social Interaction as a Consequence of Technology

Predictions of the overall benefits to interpersonal and community relationships of advancing technologies corresponded to the four themes discussed at the beginning of the previous section but were cast in a positive light. Younger-generation users of digital media have been learning to interact with and manage self-created friendship-driven and interest-driven communities. Research conducted over a 3-year period with 800 youths indicated that the majority of youth used new technologies to socialize with friends and form new friendships (Ito et al., 2008). Kamenetz' (2010) research indicated that handheld and networked devices, such as laptops and smart phones, "are tools for expression and connection, not just passive absorption" (p. 68). A research sociologist interviewed by Rheingold (2002) in his book *Smart Mobs* stated that people could gain social network and knowledge advantages, as well as a sense of community, by extending some of their knowledge into online networks and drawing out greater amounts of knowledge and potential for social interactivity than they had given.

Biotechnology advances could create improvements in the human condition physically and mentally and by strengthening the potentials of species survival. For example, one of the outcomes of biotechnology currently being pursued is life extension (Fukuyama, 2002). Futurist Kurzweil (2006) noted that nanomedicine researchers have projected that ridding humans of 50% of diseases that can be prevented would raise life

expectancy to 150 years. He went on to argue that nanotechnology might also provide a means to significantly increase brain capacity by replacing nerve cell connections with high-speed virtual connections using nanorobotics bringing about the potential of telepathic communication. Futurist writer Zey (2001) posited that nanotechnology achievements might even eradicate poverty by creating the means to produce food. Benefits to the nurturance and building of sustainable communities would be manifold in this scenario.

Surveillance technology works for the ultimate good of communities and society, as asserted by Brin (1998), when it includes the concept of transparency, which he defined as public surveillance of all citizens, private and official, and the availability to all of the data garnered through surveillance. He noted that increasing rather than decreasing information flow through the myriad technologies of surveillance would produce safer, more trusting communities; further, he stated that the Internet, video, and tracking capabilities could provide supervision for those needing medical observation and protection, among them children as well as criminals.

The era of posthumanism, or the ascendance of AI over inborn human intellect, while limited to what we might imagine within the scope of our current brain capacity, has been seen as a new frontier of opportunity and expansion for humans (Kurzweil, 2006). Vinge (1993), a mathematician and computer scientist, stated that though the ascendance of superhuman machines to positions of power over humans is inevitable, humans are yet the originators of these machines and have the choice to create initial conditions that might work to the benefit of the human species.

Because of the central role technology has come to play in the development of society, how humans choose to adapt to emergent technologies and how they choose to adapt emergent technologies to human concerns is core to the evolution of collaborative, sustainable communities. An examination of the themes of technology-created change in the future is necessary in order to provoke reflection upon the ways in which technology can be developed and integrated in the service of and to the greatest good of human society.

Theoretical Model

Goerner's (1999), theoretical constructs revolved around the complex interconnectedness of all living entities. The author envisioned a "dynamic web world" (1999, p. 264) that could potentially come into existence in 2050. In this study, Goerner's blueprint for the world of 2050 provided a model against which to compare the evolution of the fictional societies analyzed in the novels under study.

Goerner's Model of The Dynamic Web World

Goerner's (1999) vision of a dynamic web world, conjectured as a model of the optimal characteristics of a viable social order, came in contrast to the concept of the machine-like, "clockwork" (p. 31) view of the universe that was in existence from the 18th century to modern times. The author noted that between the 17th and 18th centuries a radical change occurred in how humans viewed the way the world worked: an enlightened vision emerged of a universe created by God but operating rationally, controllable and predictable through knowledge of scientific principles and technology. The radical change produced by machine science and Enlightenment thinking represented a change not just in science, but in "the entire structure of Western civilization including the

way everyday people lived their lives and experienced their world" (p. 33). However,

Goerner asserted that the machine model of social and environmental functionality was

ending, challenged by new precepts of science evidenced in the theories of nonlinear

dynamics and complexity science. She foresaw a similar change in thinking occurring as

complexity became the lens through which the world was interpreted. She conjectured that

> In 2050, most educated people will probably look out on a very different world. A Dynamic Web World will differ from the machine world in many specific ways…in its simplest form . . . [it is about] seeing everything as an ecology . . . . the world is a fractal of ecologies, nested spheres of life, biosphere, and societies of mind. [In the dynamic web world] humanity's great strategy is the pursuit of understanding—a project done best in communities where tapestries are rich. (pp. 264-265)

Goerner (1999) enumerated characteristics of the dynamic web world that she

envisioned, which included characteristics of complex adaptive entities (Bloch, 2005;

Stackman, Henderson & Bloch, 2006), discussed earlier in this section. The dynamic web

world of the near future postulated by Goerner (1999) is a universe in which creative

energy is present and powerful, and in which autopoeisis, the ability to self-organize and

adapt within, is at work in response to shifts in the environment (Bloch, 2005). Goerner's

(1999) projected universe is one in which "the one is many and the many are one . . .

entity and field are inseparable and co-effecting" (p. 266). The author went on to propose

a universe of humans guided by an understanding of the multi-layered nature of ecology,

in which beings realize that they are contributing parts of the eternal evolution of the

universe.

Relevant to the investigation of potential change in the concept of community

pursued in this study, Goerner (1999) asserted that, in the dynamic web world of the

future, inhabitants would realize that though they

may be the leading edge of [their] own small pond, [they] are not the center, the power, the end-all of Being. [They] are members of a community of Being with rights, privileges, duties and conditions of membership. [They] are part of a chain of Being that will not end with [them] . . . they become members instead of masters. (p. 266)

Goerner further posited a future world that was sensitively dependent, in that small changes would cause ever-reverberating effects, and in which complex causality guided the world. A characteristic linked to sensitive dependence was her supposition that collaboration would be the path of human beings of the future.

Integrity would be a key characteristic of the envisioned dynamic web world (Goerner, 1999). The author noted that the word integrity "comes from the same root as 'integral,' meaning *whole* [emphasis in the original]" (p. 267). Humans, she stressed, would act in ways that support and strengthen the whole.

Lastly, a dynamic web world would be a "learning universe" (Goerner, 1999, p. 267) in which humans would adopt a "web view" (p. 269) of the world, apply the knowledge of being part of an integrated universe, and understand the worth of living in harmony within the web of life. Goerner (2007) conjectured that this view of the world would lead to changes that would represent both a learning occurrence for humanity and a movement from one mode of social organization to a new and more effectual one. The characteristics of Goerner's projected dynamic web world served as a model of future social evolution with which to compare the findings of this study.

Complexity in a Dynamic Web World

Goerner's (1999) Dynamic Web World is a vision of a society of 2050 with an evolved understanding and appreciation of the complex workings of a universe in which all entities are interdependent and integrated. In this future world, society exhibits an

ability to integrate an understanding of complexity to its advantage. Goerner predicted

that "in 2050, most educated people will probably look out on a very different world . . . a

world [that is about] seeing everything as an ecology" (p. 264). Complexity science

reflects the principles that underlie the Dynamic Web World envisioned by Goerner. A

review of those principles follows.

Kuhn (2007c) maintained that, because human beings were living in a world of

technological innovation and within a complex multitude of beliefs and values,

"complexity science, in dealing with complex, interactive, nonlinear and self-organizing

phenomena, fits our times" (p.164). Kuhn (2007b) provided a broad definition of

complexity science, noting that

> complexity science . . . refers to a body of theorizing that draws on the language
> and metaphors of particular mathematical modeling. Complexity in this
> connotation does not refer to when there is a lot going on, or to when things are
> extraordinarily complicated, but rather to ways of discerning pattern and order out
> of the multidimensionality of existence. (p. 153)

Complexity science theory, previously termed "chaos theory" and, most

generally, "nonlinear dynamics" (Bloch, 2005), was newly conceived in the 1970s

(Gleick, 1987). The term "chaos," as popularly used, connoted utter disarray, and a total

lack of order or sense to things. Lorenz's (1993) definition of chaos, coming as it did

from the mathematics-based world of weather prediction, was different. He noted the

importance of clearly defining of chaos theory before proceeding to apply it (p. 6).

Lorenz's definition of chaos was therefore limited to those sequences of events "that

appear to proceed according to chance even though their behavior is in fact determined

by precise laws" (p. 7).

Lorenz (1995) made a distinction between truly random systems and systems that appeared random but are in fact were not. True randomness existed when "anything that can ever happen can happen next . . . [and] that the probability that a given event will happen next is the same as the probability that a like event will happen at any later time" (p. 6). His model of a chaotic system was deterministic, where the initial state dictates the ensuing states, although there was no appearance of control. When this happens, the system is said to be "sensitively dependent on initial conditions" (p. 8).

Gleick (1987) expanded Lorenz's (1995) definition of chaos in saying:

In science, as in real life, it is well known that a chain of events can have a point of crisis that could magnify small changes. But chaos meant that such points were everywhere. They were pervasive . . . . sensitive dependence on initial conditions was an inescapable consequence of the way small scales intertwined with large. (p. 23)

Sensitive dependence is part of what Goerner (1999) called "the dance of Chaos" (p. 106). The author noted that though a complex system was bound together, it was yet

highly sensitive. Little nudges make a big difference. Like a spinning top, the whir of forces keeps the system poised and moving. But like a top entering a rough area, balance makes the system delicate. One little bump can send it careening off in a wild new direction. (p. 106)

In sum, complexity science dealt with questions about the interdependence and sensitivity of all things to other things, and noted how interaction between entities of even the smallest proportions could ultimately lead to significant changes in a whole framework.

The Characteristics of Complex Adaptive Entities in Complex Systems

Complex interconnected phenomena exist at every level of being, from the biological to the organizational (Stackman, Henderson, & Bloch, 2006). It could be inferred from this definition, and it is pertinent to this study, that individuals, and

communities, as well as the dynamic web world (Goerner, 1999) in which humans might

exist, are all complex adaptive entities (CAEs). These characteristics were demonstrated

in Goerner's (1999) envisioned Dynamic Web World. Autopoeisis, one of the

characteristics of CAEs, refers to the ability of CAEs to maintain life by adapting and

changing from within and in response to external influences (Stackman et al., 2006). In

Goerner's projected web world, a learning universe, adaptation and change occur as

humans understand themselves to the "the leading edge of the learning universe, the

product of an evolutionary push that endlessly strives to find new ways" (p. 233).

The formation of networks is also characteristic of CAEs; they exist as part of

multiple networks as well as networks within networks. Barabasi (2003) noted that true

networks were governed by two laws: growth and preferential attachment. Goerner's

(1999) model of the dynamic web world theorized that there was interconnectedness

between beings at all levels of existence. A further characteristic of CAEs was that they

survive by finding fitness peaks or points of balance between order and chaos (Stackman

et al., 2006). Waldrop (1992) called this "the edge of chaos . . . the constantly shifting

battle zone between stagnation and anarchy, the one place where a complex system can

be spontaneous, adaptive, and alive" (p. 12). Fitness of individual entities is always

connected to and dependent upon the dynamic web world around them, and that synergy

is what ensured their survival (Goerner, 1999). An examination of existing mechanisms

for survival and creativity in the fictional societies of the works under study, to determine

how or if they had established fitness peaks, produced useful data.

Finally, CAEs have sensitive dependence upon each other; therefore, minor

changes can produce major effects. Lorenz (1995) linked sensitive dependence to the

"impossibility of making perfect predictions, or even mediocre predictions, significantly far into the future" (pp. 10-11). Sensitive dependence also ensures that, regardless of where entities begin a trajectory, small changes can occur that inevitably cause them to separate (Bloch, 2005). Goerner (1999) noted that entities change together, yet still continue on their separate sequential pathways. They are also self-organizing; multidirectional interactions between elements create the growth that is evident in living, dynamic worlds.

Section Summary

Goerner (1999) posited a future in which a dynamic web world would emerge; a world in which change would be the rule, accomplished through a natural and intertwined system "of a great design which embraces and links all things great and small" (Goerner, p. 424). The future web world would exhibit an understanding of the complex workings of the universe, and integrate this knowledge into its social constructs.   The author further proposed that human beings, as part of a complex and dynamic universe, were in the lead of a learning universe, with the goal of joining to become part of a linked, "mutualist culture" (p. 272) signaling the social precept that "the one is many and the many are one" (p. 266). According to Goerner, collaboration would be the preferred mode of interaction and life would be furthered as individuals act to strengthen the whole of society.

Research Questions

This study addressed the following research questions:

1. What role, if any, does technology play as a cause and/or mechanism of change in community interaction and interpersonal interaction in the speculative fiction novels under study?

2. In what ways does the interface between humans and technology lead to human and technological adaptation in the speculative fiction novels under study?

3. In what ways are the earlier to the later novels of each author under study similar or different from each other in terms of themes?

Definition of Terms

Adaptation: Adaptation is "a feature that is common in a population because it provides some improved function" (The University of California Museum of Paleontology, 2006). In speculative fiction, for example, adaptation may be to the demands of living in a virtual reality, or of evolving an intuitive ability to interface with computer systems.

Community: The *Dictionary of the Social Sciences* (Calhoun, Karaganis, & Price, 2002), presented the traditional definition of community as signifying a group of people in communication with each other, and centered on physical place, face-to-face interaction, and acceptance mainly of those within the group. Vaisey (2007) concluded that, in terms of human experience, shared beliefs and morals were characteristics that define communities, both on the Internet and in the physical world, and that communities were places in which members felt a sense of belonging. Christakis & Fowler (2009) noted that the Internet was host to countless socially networked communities.

Cyberpunk: a subgenre of speculative fiction that most often is involved with future scenarios of invasive biological, information, and communication technology. Kelly and Kessel (2007) stated that concepts of virtual reality and encompassing data networks which can absorb the disembodied consciousness of humans are central to the cyberpunk world. Although a body of cyberpunk speculative fiction tends toward dystopianism and characters' disillusionment with established society, this is not always the case; a "gleefully subversive attitude" may also prevail in cyberpunk writing (p. ix).

Cyberspace: This term was introduced by speculative fiction author William Gibson in 1984, and indicates an "imagined actual territory or landscape . . . in a [soon-to-come] era in the future in which the human brain and nervous system (biological) can interface directly with the global information network (electrical) by jacking neurally implanted electrodes directly into a networked computer" (Clute & Nichols, 1995, p. 290).

Dynamic web world: Goerner's (1999) theory of the dynamic web world asserts three core characteristics of the way in which the universe functions: (a) the universe is a learning entity; (b) the universe functions collaboratively; and (c) the universe is a world of complex, interconnected, and ever-changing networks. The dynamic web world operates as a "mutualist culture" (p. 272).

Dystopia: a hypothetical future society which is more fearful and worse in many aspects—typically politically and socially—than the current society (Clute & Nichols, 1995).

Eutopia: a hypothetical future society that is good but not perfect (Clute & Nichols, 1995; Simmons,1998).

Far future: The far future in speculative fiction generally reflects two poles of "images of the distant future: the future of prophecy and the future of destiny" (Clute & Nichols, 1995, p. 415). The speculative fiction of prophecy concerns itself with warnings about the ultimate consequences of present-day behavior, whereas speculative fiction focused on the destiny of humans is unconcerned with the future, but rather, with a distant world almost completely unrecognizable to present-day humans, or totally utopian (Clute & Nichols).

Mediated communication: Mediated communication refers to any communication between humans that occurs via technological tools, such as computers and mobile telephones (Katz, Rice, Acord, Dasgupta & David, 2004).

Near future: In speculative fiction, the near future is concerned with a world in which humans of the present may actually live at some point. Although this world is imaginative, it is recognizable to present-day human beings. The near future reflects both the hopes and the concerns of humans, and as such, is generally optimistic or pessimistic (Clute & Nichols, 1995).

Nodes, links and hubs: Nodes and links provide a visual representation of the formation of networks (Barabasi, 2003). Using the example of the World Wide Web, Barabasi described the web pages on the Internet as nodes, or starting points. Links, "the stitches that keep the fabric of our modern information society together" (p. 56), represent the users that visit the various web pages. The author described hubs as nodes that receive an unusually large number of visitors (links), and noted that hubs are the most visible points of connection on the Internet.

Present (time): For the purposes of this study, the term "present*"* referred to the post-World War II era up to the current time in which we live. *Present-time* referred to the period from the 1980s to the current time in which we live.

Posthumanism: Posthumanism describes a time period in which human beings, led by science and technology, will have transcended the limitations of natural human intelligence (Goertzel, 2006), attaining such potentials as the ability to use the brain to communicate directly with computers and each other, and, in the virtual worlds of the internet, to "solve equations by hybridizing our intuition with that of an [Artificial Intelligence] mathematician, all of it feeling realer than real" (p. xiv). Goertzel postulated that, when humans have created technology that exceeds human intelligence, foundational transformations will take place in human society, ushering in the age of the posthuman.

Privacy: A wide array of conceptions of privacy exists. Among those often advanced as defining characteristics are a) the ability to control information about oneself, and b) the ability to control access to oneself (DeCew, 2008). While privacy is valued as "a sphere within which we can be free from interference by others . . . it also appears to function negatively, as the cloak under which one can hide domination . . . " (DeCew, 2008, p. 1).

Reality: A basic definition of reality is "having physical existence or substance" (Oxford University Press, 2006). However, in speculative fiction, the concept of objective reality is questioned, with a central theme of the genre exploring the issue of whether "human perceptions of the outside world correspond to reality" (Clute & Nichols, 1995, p. 920) or whether these perceptions simply represent intellectual

suppositions that provide humans with a partial or inaccurate picture of outside reality. Further, in speculative fiction, the actual existence of one outside reality is examined, and juxtaposed with the idea that external reality "is itself a mental [rather than physical] construct" (Clute & Nichols, 1995, p. 920).

Social Networks: Christakis and Fowler (2009) defined social networks as communities both in the physical world and on the Internet where people gather and communicate. Their characteristics include (a) an ability to remain integrated and functional independent of individual members; (b) a collective intelligence which enhances the intelligence of individuals within the group; (c) an ability to replicate themselves, and (d) the potential to self-reinforce and heal themselves.

Society: The definition of society is multi-sided. Traditional definitions hold that societies are "bounded nation-states, each with…guarded frontier, language, and culture" (Kuper, 1992, p. 7); that each person is part of one society and one culture (Kuper, 1992) and that boundaries of societies are concurrent with their nation-state's physical borders (Agnew & Corbridge, 1995). Current definitions hold, rather, that "societies are always open and disordered . . . biculturalism, skepticism about conventional values, continual adaptation to fresh situations—these are the norms" (Kuper, 1992, p. 7) and that societies can be seen as a variety of individuals interacting through intellectualized social forms in order to further individual needs and goals (Willson, 2006).

Singularity: This term was originated by speculative fiction writer and mathematics and computer sciences professor Vernor Vinge (Clute & Nichols, 1995), and indicates a time period when, as a result of advanced technologies, entities with greater than human intelligence might be created (Vinge, 1993). Vinge speculated that

these entities might include computers that are sentient machines, large computer networks and users that together form superhumanly intelligent entities, computer interfaces so customized to individual users that users would possess superhuman intelligence, and biological enhancements to the human brain that would greatly accelerate natural human intelligence. Vinge, therefore, posited that at the time of the singularity a dramatically new social order would come into being.

Speculative fiction: The phrase is commonly used by writers and critics wishing to soften boundaries between hard (science-based) and soft (sociology-based) science fiction, delineating writing that encompasses both of these subgenres (Clute & Nichols, 1995). Gunn (2002) defined speculative fiction as a genre of literature that analyzes real-world change and extrapolates what its effects might mean for the future. He observed that the genre often deals with changing technology or science, and that its focus is generally on issues of global significance.

Technology: In speculative fiction, Clute and Nichols (1995) stated that the concept of technology generally encompasses the belief that machines have the power to change the world, a belief originating around the time of the Industrial Revolution and inspiring foundational works of speculative fiction. Conflicting views of technology, both positive and negative, are often presented in speculative fiction.

Utopia: a hypothetical future society that is ideal in its many aspects, and most often scientifically advanced (Clute & Nichols, 1995). The necessity of drama and conflict in fiction has meant that few speculative fiction works are truly utopian in setting and outlook; however, some works offer "a kind of utopia secured by technological advancement, especially in the biological sciences" (p. 1262).

Virtual reality: Virtual reality is commonly defined as an illusion of reality created by a computer system (Tech Terms Computer Dictionary, 2006), which seems, to a person entering into it, to accurately reflect the outside world. Two qualities of virtual reality worlds are common: Entrants are able to immerse themselves in the world, and are able interact within the world (Tech Terms Computer Dictionary, 2006). Virtual Reality can also be defined more broadly to mean "any secondary reality alternate to the character's world of real experience with which he or she can interact and that is machine-mediated" (Clute & Nichols, 1995, p. 1285).

Limitations

The goal of this qualitative, complexity science based study was to extrapolate, through analysis of fictional texts and through the frame of complexity science, the ways in which future interpersonal and community interaction might change, relative to the present, as a result of technological advances. Because the future could not be reliably predicted, the study was limited to presenting a scenario of possibilities that were not, in any concrete sense, generalizable to existing reality.

While the study's small sample of four novels by two authors was not ultimately generalizable to the findings of other works of speculative fiction, the goal of generalizability was not the motivating factor in this qualitative research study. "Qualitative methods typically produce a wealth of detailed information about a much smaller number of people and cases. This increases the depth of understanding . . ." (Patton, 2002, p.14). Further, when considered in the light of current technological and social developments, the themes uncovered in the Findings section of this study, had the potential of indicating trends that might continue or evolve in the future.

Significance

This study contributed to the body of research in the field of speculative fiction by presenting a creative synthesis of themes of major works of two eminent speculative fiction writers related to social change and technology. Complexity science was used as a framework for the study. A search of the indexes of the major speculative fiction research journals and of major literature databases did not reveal a similar study. Further, although the study's findings, based on speculative portrayals of the future, were not generalizable to existing reality, they were recognizable to those living in the present, and might "increase and deepen understanding of the phenomenon studied" (Patton, 2002, p. 467).

The study also has relevance to present-day organizations as they respond to new technologies. Although rooted in fiction, which examined hypothetical worlds, speculative fiction is "much more about reflexivity to current social trends/structures than about the kind of foresight planning, which is of increasing concern to . . . companies" (McHugh, 2001, p. 22). Thus, this study, in examining the society of tomorrow, provided a fresh way of assessing society today.

In terms of organizational theory, the significance of an analysis of speculative fiction was in its methodology as much as in its message. McHugh (2001) noted that

> . . . effectively, then, SF [speculative fiction] makes variables out of what everyday life often treats as ontological and epistemological "fixities." Through the appropriation of potential realities as thought experiments, SF is able to examine the implications and iterations of ideas and their applications as *strong determinants* [emphasis in the original] of psycho-social, politico-economic, and ideological/cultural gestalts. Then by confronting us with what oppositional constructs might imply if they were strong determinants of reality, it forces us to think outside of the bounds of acceptable knowledge or conventional wisdom, as good analytical research should. (p. 23)

Thus, to adapt to the changes made possible and inevitable through technology, organizations might learn from a study of speculative fiction new methods of framing new organizational realities.

CHAPTER II: REVIEW OF THE LITERATURE

Overview

The purpose of this study was to examine potential changes, motivated by technology, in future interpersonal and community interaction. Insights into future social realities were sought through analysis of the literature of speculative fiction. The study, framed in the principles of complexity science, involved a thematic analysis of Vernor Vinge's *True Names* (2001) and *Rainbows End* (2006), and William Gibson's *Neuromancer* (2000) and *All Tomorrow's Parties* (1999).

The profound and continuous change in present-time modes and mores of social interaction engendered by new technologies has raised questions about how the concept of human connectedness would change, if at all, in future society, and whether changes would benefit or threaten the viability of society. Because the potential for harmonious and collaborative interaction was one measure of sustainability in both interpersonal and community relations, an examination of technology-created change in the future provoked gainful reflection upon the ways in which technological development best served the complex, interdependent, and emergent world that human beings inhabited.

The literature relevant to this study covered five areas: (a) literature examining the rationale for the interdisciplinary study of literature and science; (b) literature examining the principle of studying literature and technology as linked disciplines; (c) studies examining the genre of speculative fiction and the ways in which these studies have depicted future technologies and their effects on society; (d) literature pertinent to the current social sciences discussion of definitions of community and (e) literature relevant to complexity science, community, and technology.

A Rationale for the Interdisciplinary Study of Literature and Science

The academic discussion of the usefulness of the study of literature versus science in terms of transmitting important knowledge has gone on for some time. In 1882, Arnold wrote an essay, "Literature and Science," which was later presented as a lecture. The essay dealt with the tension existing in the academy of the times, which was linked to the value of the teaching of *belles lettres*—philosophy and literature—versus the natural sciences. Arnold noted that the sciences were increasingly thought of as practical, solid, and grounded, whereas the study of literature was considered less relevant to the thriving industrial society of the United States. Though Arnold argued for the equality of both disciplines, he saw each as a completely separate field of study: science, the study of the facts of the world, deduced through observation and experimentation; and literature, the intellectual study of human nature and society.

In 1959, Snow delivered a lecture, later developed into a book entitled *The Two Cultures and the Scientific Revolution*, in which he described a schism between the worlds of science and literature and deplored the scientific illiteracy of those in the humanities. Snow advocated the building of bridges between the two disciplines: "The clashing point of two subjects, two disciplines, two cultures—of two galaxies, so far as that goes—ought to produce creative chances" (p. 17).

The discussion came full circle to Arnold's (1882) "separate but equal" contention when, in a 50th-anniversary commemoration of Snow's (1959) discourse on the estrangement of literature and science, Caldwell (2009) reviewed Snow's remarks and queried the need to connect the two cultures at all, noting that science "gives an objective, value-free picture of the universe, whereas art gives us the inward view, tells us what it is like to live in the world" (p. 21).

However, the interrelated nature of literature and science was being increasingly explored and affirmed by scholars and writers focusing on interpretations of society and culture ringing true to human experience. In *Charles Dickens in Cyberspace: The Afterlife of the Nineteenth Century in Postmodern Culture,* Clayton (2003) advanced the premise that, in a computer-driven, information-based economy, literary culture had an essential role to play in the interpretation of complex language and semiotics. Interest in a convergence of the two disciplines led to the creation of an academic discipline that blended the study of literature and science. In 1985 the Society for Literature and Science (now the Society for Literature, Science, and the Arts) was founded, a group dedicated to exploring the interrelationship between science and literature (Schachterle, 2002).

In a study of the symbiotic relationship of literature and science, Smith (1997) analyzed five German literary works to support a thesis in which he asserted the significant impact, from a cultural standpoint, that literature had upon the understanding of new scientific ideas. Smith organized his study into sections in which he cited proponents and opponents of the concept of the equal validity of literature and science in interpreting culture, and then analyzed works from German literature to present a rationale for his central thesis. Smith asserted that science did not exist in a vacuum, and was, as he stated, "one of many equal discourses in human culture . . . [not] ultimate knowledge" (p. 390). On the opposite side of the issue, Smith questioned the manner in which the hypotheses and metaphors of science were employed by other disciplines to lend a sense of legitimacy to them. Smith's analysis of selected texts led to his conclusion that an important function of literature had been and would continue to be "to challenge, modify, and demythologize the metaphors of science" (p. 398).

A Rationale for the Study of Literature and Technology

In their introduction to *Literature and Technology*, Greenberg and Schachterle (1992) posed the question of why literature and technology should be studied in relation to one another. The authors noted that technology was traditionally perceived of as even less relevant than scientific theory to the study of ideas and human motivation. It was seen as craft, with little to offer in the way of intellectual analysis. Yet the authors made the point that "what makes our daily lives different from what they would have been even a generation ago is technology (*techne,* craft)—not science (*episteme,* pure knowledge) (p. 13). Greenberg and Schachterle concluded that, because literature examined the lives humans lived within the context of the world they lived in, technology and literature had a clear connection. The authors began the essay collection with an explanation of early concepts of the meanings of art (including text) and science, pointing out that the idea of a difference between arts and crafts did not begin to come into being until the 18th century. The authors went on to examine the interconnectedness of literature and technology by compiling a series of scholarly essays tracing the functions of technology and social realities in philosophical and fictional literature.

In the introduction, Greenberg and Schachterle (1992) cited four reasons for the relevance of a relational study of literature and technology. First, they posited a fundamental connection between technology and the social realities that fictional literature reflects: "Technology impinges on our lives, indeed often more palpably than the abstract sciences do; thus, it becomes part of the environment within which literature works" (p. 16). Second, the authors noted that literature was written in the context of complex social realities and that technology was often the frame through which those realities were viewed. Literature, they contended, was as much about creating as thinking,

and writers' creations were brought into society through the technologies of typography and the printing press and, currently, through the myriad media outlets that had evolved with technological advances. Third, beyond being part of or a frame for viewing the social world that reality reflects, the authors pointed out that technological creations were often the engines that transformed and enlightened social reality. Finally, Greenberg and Schachterle cited a historical belief in the narrow, unimaginative, and even antagonistic relationship of literature and technology, and asserted an opposing idea, that the conjunction of literature and technology could illuminate the sense of freedom and connection with the physical world that technology offered. The authors concluded that literature could present a picture of society in which technology was shown in its fullest role, and the acknowledgement of technology as an intrinsic force in human interactions gave truthfulness to literature.

Illustrating the way in which technology became the means of the message, Greenberg (1992), in his essay "Romantic Technology: Books, Printing, and Blake's Marriage of Heaven and Hell," examined the works of the Romantic poets writing at the inception and through the period of the Industrial Revolution. Greenberg examined Romantic poets who

> lived through the crucial period in which the rise both of democracy and of industry was effecting qualitative changes in society . . . the pattern of change was not background, as we may now be inclined to study it; it was, rather, the mould in which general experience was cast. (pp. 154-155)

He noted that Romantic poets were fascinated by the new technologies of their times and yet appalled by the cultural changes these technologies wrought. Greenberg contended that Romantic poets protested the commercialization of literature and art through the technology of typography and the mechanical reproduction of texts and yet ironically

"attacked the Industrial Revolution from a medium created and supported by the very system they abhorred" (Greenberg, p. 156). Thus, Greenberg demonstrated that, in a concrete sense, literature and technology were interdependent.

As an example of the transformational and enlightening force of technology, Knoespel (1992), in his critical essay "Gazing on Technology: *Theatrum Mechanorum* and the Assimilation of Renaissance Machinery," discussed the ways in which machines in the Renaissance were integrated into society through the narrative response elicited by them, and how such narrative played a role in the integration of technology into society. In his study, Knoespel stated as his intention to distinguish the means through which Renaissance society adapted to new technologies, in order to show that the "narrative responses provoked by Renaissance machines . . . function as a means for the social absorption of new technology" (p. 99).

Knoespel (1992) analyzed one particular aspect relevant to this study's focus on the effects of technology and literature, discussing the framing of machines through metaphor, and the ways in which metaphor imbues machines with the qualities of power and autonomy**.** Using as an example from the poet Spenser's poem, *The Fairie Queene,* published in 1590*,* Knoespsel showed the way in which the new technology of the time was imbedded in the narrative of the poem. The garden that the protagonist made his way through, the Bower of Bliss, was a metaphoric representation the Garden of Eden. Yet, rather than being engineered by a spiritual force, it was, in fact, a "technologically perfected garden" (p. 115), replete with wave-machine technology and an organ powered by water, providing apparently heavenly music. In relation to the significance of the way in which technology had played an important role in the messages of literary works,

Knoespel asserted that the poem encouraged its reader to "recognize technological as well as poetic artifice . . . . the presence of the Bower of Bliss intensifies the warning that one cannot trust appearances" (p. 117). In this sense, Knoespel argued, the poem was a conduit of the meaning of and not just the fact of new technology. He affirmed, in summary, that literature served as the means through which readers could interpret and reflect upon the effects of new technology.

In a critical study entitled *Toward an Archeology of the Philosophy of Technology,* authors Mitcham and Casey (1992) analyzed the relationships between philosophy, literature, and technology. The authors proposed that "the Platonic and Aristotelian reflection on techne . . . can be interpreted as an attempt to respond to the conflicting responses to technology presented by the Greek tragedians" (p. 55). The authors asserted that, therefore, literature mirrored the complex social response to technology. Mitcham and Casey viewed literature as presenting the social outcomes of technology in primarily three modes: technology as a neutral force, technology as a means to a utopian society, and technology as a force creating negative or even catastrophic results. The authors found that the most prominent depiction of technology's effects was as a neutral force in the lives of humans. They referred to works of literature by modern and postmodern writers to illustrate this neutral force. One illustration that authors Mitcham and Casey presented was taken from Joyce's novel *Ulysses,* published in 1922. The telephone, at that time a new technology, was seen as a metaphor, neither good nor evil, for the connection of humans back through history to Eden.

A very different kind of link was discussed by Porush (1991) in an essay entitled "Fictions as Dissipative Structures: Prigogine's Theory and Postmodernism's

Roadshow." The study's purpose, as indicated by Porush, was to show how Marshall's

1988 novel about traffic jams, *Roadshow,* functioned in itself as a dissipative structure.

After explicating the qualities of dissipative structures as entities that live and self-

organize when receiving energy but die with a lack of energy exchange, Porush

illustrated how *Roadshow* demonstrated these qualities, and how any text could be seen

as a "biosocial phenomenon" (p. 62) in the way that a text "breaks out of its

programming" (p. 69) to self-organize. He discussed the ways that, not only in conveying

and delivering a message, as illustrated by Greenberg (1992) and Knoespel (1992), but in

the way stories formed and reformed themselves, that literature could illustrate life's

complex workings (Porush, 1991). He also noted the degree to which the branch of

scientific thought called complexity theory reflected life (Porush, 1991). The relevance to

the present study and its focus on science and technology was that complex models of

life, which fiction could represent, closely depicted the way in which the world

functioned (Hayles, 1991). Porush asserted that the value of linking literary texts to

scientific models was in their ability to accurately depict and understand the processes of

the human mind, since "limitations in our understanding of the universe . . . [are] bound

up with the nature of our minds" (p. 76).

A Rationale for the Interrelated Study of Speculative Fiction and Technology

Mitcham and Casey (1992) asserted that literature presented the social outcomes

of technology in primarily three modes: technology as a neutral force, technology as a

means to a utopian society, and technology as a force creating negative or even

catastrophic results. Following the categories defined by Mitcham and Casey, this section

of the review of literature is divided into literary studies analyzing the three modes in

which speculative fiction portrayed the social outcomes of new technologies: as dystopian or wholly disadvantageous, as utopian or wholly beneficial, and as eutopian or in part beneficial and in part disadvantageous. Though the use of these categories provided a systematic manner in which to survey research into these fields, the purpose of this section of the review of literature is not to focus on the types per se, but rather to present a representative picture of how speculative fiction presented technology and its effects upon society.

<center>*Dystopian Speculative Fiction*</center>

In an overview of this topic, Elhefnawy (2006), in his dissertation entitled *The Promise and Peril: Science Fiction's Depiction of Technology,* examined fiction from the 17th to the 20[th]century for the purpose of showing how utopian visions of society in speculative fiction had been moving to increasingly negative views of a technology-driven existence. Elhefnawy's study findings revealed a dominance of negative themes pertaining to the issue of integrating new technology into society. However, he noted an undercurrent of hopeful themes in relatively recent speculative fiction: As technology moved toward creation of super intelligence it would augment the physical and mental capabilities of humans, thus giving them control over technology's damaging effects.

In the book *Technophobia! Science Fiction Views of Posthuman Technology,* Dinello (2005) explicated the split in speculative fiction literature between the science-based promise of a techno-utopia, an ideal society served by advanced technology, and the reality-based predictions of a techno-dystopia, a flawed society harmed by advanced technology. His hypothesis was that "such technophobic science fiction serves as a warning for the future, countering cyber-hype and reflecting the real world of

weaponized, religiously rationalized, and profit-fueled technology" (p. 2). His focus remained primarily on the blurred human/machine distinction in the areas of advancing cybernetics, bioengineering, nanotechnology, and artificial intelligence, all of which were presented as negative technological capabilities.

In successive chapters, Dinello's (2005) study encompassed a progression of ideas detailing the negative aspects of technology. In essence, the author showed speculative fiction as a literature that projected the potential and destructive capabilities of a technology-based future. Dinello asserted that trans-humanist religious cults would replace traditional religion, and referenced his claims by citing various futurist thinkers. Reinforcing his claim of the predictive purpose of speculative fiction, Dinello noted Vonnegut's novel *Player Piano,* published in 1952*,* as a picture of a currently evolving techno-tyranny, in which humans become cybernetic slaves. Dinello analyzed the works of several contemporary speculative fiction writers and examined their depictions of a receding real world and the ascendance of virtual reality and the human merger with machines. Through Atwood's 2003 novel, *Oryx and Crake,* Dinello provided an example of a novel dealing with futuristic bioengineering capability: "Atwood imagines a surrealistic world of biological chaos. . . . gene-spliced mice, addicted to the insulation on electric wiring, overrun Cleveland, setting the city on fire" (p. 259). Dinello concluded his book with the assertion that, based on his analysis of the various real-world technologies currently under development, science fiction's value was in its cautionary nature and its powerful ability to envision the consequences of the spread of destructive technology.

Mogen's (2008) basic premise was that speculative fiction, in the same way as realistic fiction, makes salient observations about contemporary problems. In a critical essay entitled "Images of the Future: Technology and the Frankenstein Myth," Mogen examined several of Bradbury's works, written from 1950 to 1953, including the novels *The Martian Chronicles* and *Fahrenheit 451*, and the short stories, "The Pedestrian" and "The Veldt." Mogen began with an analysis of Bradbury's shifting perceptions of the good or harm of technology in society:

> Because he associates space travel with the American frontier myth, his space-travel fiction tends ultimately to celebrate our destiny in the cosmos, [whereas] his science fiction stories set on earth tend to be warnings, projecting futures in which unresolved contemporary problems have become monstrous in scope. (p. 1)

Mogen (2008) used the metaphor of the Frankenstein myth to analyze the dystopian perception of technology in Bradbury's writing. Just as Dr. Frankenstein undertook the creation of a human being, giving no thought to possible negative consequences, Mogen asserted, so humans create technology with little thought given to the social consequences of such creation. Mogen used Bradbury's story "The Veldt", published in 1950, to demonstrate a basic premise of Bradbury's speculative fiction—and of dystopian speculative fiction in general—that it warned "not so much about the harms of technology itself but of allowing it to substitute for basic human needs" (p. 4). Mogen summed up his analysis of the dystopian slant of much of Bradbury's work by indicating that Bradbury had indicated that speculative fiction, by perturbing readers with worst-case scenarios, might indeed be humanity's best hope for survival.

In his study entitled *Technology and its Discontents*, O'Har (2004) contended that contemporary fiction writers tended toward pessimism about society's future, particularly when considering the potentials of science and technology. The central question of his

study was whether utopia, as a concept, had become defunct. O'Har's study of the utopian and dystopian novel dealt with the question of whether utopian novels were a sustainable genre. He followed his line of inquiry with a discussion and analysis of three novels he considered to be core works in the utopian tradition: *Utopia,* by More; *The New Atlantis*, by Bacon; and *Looking Backward,* by Bellamy, and then contrasted these utopian novels with two dystopian novels written after World War I and World War II, *Brave New World*, by Aldous Huxley, published in 1932, and *1984*, by George Orwell*,* published in 1949. Based upon his analysis of the novels, he posited that the theme that ran through the utopian novels was the belief that technical and scientific knowledge had the power to redress the problems of society. This vision, according to O'Har, faded with the advent of successive world wars. Technology in the two dystopian novels analyzed was, he noted, presented in contrast as "a tool of systematic repression" and "the machine [that] enslaves, and does not liberate" (p. 483). Thus, the central question of O'Har's study, of whether utopian fiction was defunct, was answered in the affirmative. However, he closed his study of utopian and dystopian literature with a discussion of Floorman's novel *Aftermath*, published in 2001, interpreting it as an example of a current revival of the utopian tradition, in which the redemptive power of science became believable.

Utopian Speculative Fiction

The purpose of Simmons' (1998) survey of American utopian novels was to address what the author hypothesized as a lack of awareness of the increasing numbers of utopian novels in the last three decades; hence, it provided an effective overview for this section on utopian speculative fiction novels. The research questions of Simmons' study included: (a) whether it was accurate to claim that utopian literature declined after 1900 and virtually disappeared after World War II, (b) which theory best explained the waxing

and waning of the utopian novel, (c) whether content, style, and tone of the utopian novel had changed, and (d) how accurate a gauge of cultural optimism or pessimism utopian novels were. In his research, Simmons surveyed approximately 1,000 novels classified as utopian, providing a sense of the extent of utopian literature in general. The research made specific reference to speculative fiction writers with a mass readership and a scholarly following. Simmons presented findings that indicated that the publication of utopian novels fluctuated in a complex pattern that was not easily identifiable. His research further indicated that while utopian fiction might illustrate the hopes or fears of a specific group of writers, it was not, on the whole, a reliable gauge of social optimism or pessimism.

Heise (1997), in a critical essay entitled "Between Technophobia and Utopia: Science and Postmodern Literature," traced a view that opposed the notion that literature portrayed technology in a negative light. The author noted that "literature's self-definition over the last two centuries . . . as representing the imagination, intuition, and emotions, opposed almost by default to the 'inhuman' mechanistic explanations of the world that science allegedly offers, [is fading]" (p. 1). Heise's studies of various works of non-speculative fiction writers and speculative fiction writers alike indicated that the lines between technology and literature were blurring as computers transformed the work of artists in all fields. Suggested also in Porush (1991), Heise noted that scientific theories, such as entropy, were often used as a lens through which to investigate patterns in society. The biggest change in both society and literature, she asserted in her findings, was the perception of the nature of change, particularly change driven by technology. Mental, physical, and cultural outcomes of technological transformation that might have

provoked a sense of dread in modern writers such as Huxley, Heise contended, were seen by postmodern writers as either aspects of current social reality or as sources of fascination and possibility. Ultimately, her conclusion correlated with the contention of Greenberg and Schachterle (1992) that literature, when portraying technological progress, could effectively convey the sense of freedom and potential that technology enabled for individuals and societies.

In *Utopia and Science Fiction*, Williams (1978) grouped utopian science fiction into four primary types: (a) the paradise, (b) the externally altered world, (c) the willed transformation, and (d) the technological transformation, the section most relevant to this study. He highlighted the idea that these categories could be applied to dystopian fiction as well by focusing on their negative rather than on their positive consequences.

In utopian speculative fiction that is based on the concept of technological transformation, Williams (1978) noted, the premise is that through applied science a new life had been made, and that "as more generally in technological determinism, this has little or no social agency, though it is commonly described as having certain inevitable social consequences" (p. 2). Williams used the 1871 utopian novel *The Coming Race,* by Bullwer-Lytton, to illustrate the way in which technology was seen as an agent of change, independent of its creators. Through advanced technology, one stratum of the society had engineered a limitless energy source, which freed it from the need to work. In the resulting society, affluence delivered freedom from all the attendant challenges of survival, competition, and aggression; centralized government disappeared. What results, noted Williams, is a "civilising transformation . . . magically achieved" (p. 4). Williams established a link between willed social transformation and technological transformation

when he noted that "the technology need not be only a marvelous new energy source, or some industrial resource of that kind, but can be also a new set of laws, new abstract property relations, indeed precisely new *social machinery*" (p. 5). In his conclusion, Williams cited a return by some speculative fiction writers to the utopian tradition. He asserted that the impulse toward utopianism would renew itself in this form of fiction.

Eutopian Speculative Fiction

Eutopia was defined as a term for "a good, but not necessarily perfect, society" (Simmons, 1998, p. 199). This outcome was in fact the most frequent projection made in literature dealing with society and technological impact (Mitcham & Casey, 1992). The sub-genre of speculative fiction known as cyberpunk and its antecedent, post-cyberpunk, was an example of a genre of speculative fiction in which technology was core to the development of society and where change, for good and bad, was a given (Kelly & Kessel, 2007). Kelly and Kessel asserted that although the cyberpunk view of society tended toward the dystopian, technology was frequently depicted as a positive; as a door to empowerment.

In *Re-Wired: The Post-Cyberpunk Anthology*, editors Kelly and Kessel (2007), speculative fiction and cyberpunk writers themselves, presented a collection of stories that represented second-generation concerns within the cyberpunk writing community about information and bio-technology. The book began with a history and analysis of the cyberpunk movement. Each story was preceded by commentary that linked the story to previously established characteristics of the sub-genre. The authors noted that, among its strongest characteristics, was the "engagement with developments in infotech

[information technology] and biotech [biotechnology], especially those invasive technologies that [would] transform the human body and psyche" (p. ix).

In their introduction to the anthology, Kelly and Kessel (2007) observed that most speculative fiction was cautionary in nature, suggesting a need to limit change in order to prevent problems. They contended that there was a general assumption that people had control over technological change and that, by controlling technology, traditional social values could be preserved. In contrast, the authors noted an important insight of cyberpunk writers—that humans were no longer changing technology, but that technology was in fact changing humans. It was in this stance, Kelly and Kessel indicated, that speculative fiction of the cyberpunk genre was often representative of eutopian novels. They noted that dystopia was a personal perception and that projecting change as loss or catastrophe was, in effect, beside the point of eutopian narratives.

In *Charles Dickens in Cyberspace: The Afterlife of the Nineteenth Century in Postmodern Culture*, Jay Clayton (2003) advanced an understanding of the historical parallels existing in culture, observing both the aspects of culture that recur and those that ebb or disappear. Clayton presented evidence of convergences throughout the 19th through the 21st centuries of the two cultures, science and literature.

Relevant to this study, Clayton (2003) utilized speculative fiction writer Neal Stephenson's 1999 novel *Cryptonomicon*, a novel dealing with information technology, to demonstrate the eutopian values he saw emerging in fiction and reality today. Stephenson's novel had two story lines, one occurring during World War II and one set in the present day. The two stories mirrored the novel's basic premise about the advancement of information technology: that it would bring about a convergence of

diverse entities for a common goal or a common good. Clayton asserted that the novel celebrated the "technology of freedom" (p. 207) and yet that its characters demonstrated a balance in their responses to technology. In the novel, there was a realization on the part of its characters that pure utopianism could render them "both self-satisfied and marginal to real structures of power" (p. 208). Alternatively, the characters knew that fear and secrecy put an end to the exchange of ideas that supported achievement. The eutopian tone of the novel was evident as Clayton cited a character's reflection: "One must augment one's techie skills with a keen sense of history and a critical perspective—one must develop, in short, 'literary' values and techniques" (p. 205).

Ultimately, Steinmuller (2003) asserted the role of speculative fiction in the real-world discussion of technology's impact on society when he stated:

> Speculative fiction [SF] can prompt . . . "cognitive estrangement"—fantastic imaginings in the service of knowledge, not as a whole for pure escapism. However, one should not confuse cognitive value with prediction. The principal question "what if . . ." does not aim at forecasts, but implications of a presupposed novum. SF, from that point of view, comes close to a kind of fictional technology assessment. Or, as Fred Pohl put it: "A good science fiction story should be able to predict not the automobile but the traffic jam." (p. 176)

Section Summary

The connections between literature, science, and technology have been much debated; traditionalists such as Arnold (1882) held that the disciplines were separate, with little to cross-reference, while modernists, represented by C.P. Snow (1959), believed that the disciplines were interrelated and should be studied with reference to each other. In 1985 Greenberg and Schachterle (Schachterle, 2002) created the Society for Literature and Science (now the Society for Literature, Science and the Arts), beginning the formal discipline in which literature, science and the arts were studied in an interdisciplinary

manner. Smith (1997) concluded that literature played an important role in interpreting and permitting a clearer appraisal and understanding of scientific constructs.

The beneficial nature of the study of literature and technology was particularly relevant to this study. Greenberg and Schachterle (1992) elucidated four reasons for the efficacy of studying these together, noting that: (a) technology was an inseparable part of the fabric of social reality, (b) the complexity of social reality was frequently viewed through the frame of technological realities, and that technology had a fundamental role in the actual delivery of new ideas to society, (c) technology frequently drove change in society and (d) study of the confluence of the two disciplines was an opportunity for creativity and illumination. Greenberg (1992) examined the romantic poets, writing during the era of the Industrial Revolution, and discovering a dual response to the cultural changes occurring in society as a result of the commercialization of literature and art. The Romantic poets expressed a fascination with new technology while at the same time demonizing its effects. Greenberg noted that, despite the romantic poets' criticisms of the effects of technology upon society, they employed technological inventions to disseminate their texts.

The metaphors through which machines were framed in literature were analyzed by Knoespel (1992), who noted that, as early as 1590, English poet Edmond Spenser, in the poem *The Fairie Queen*, depicted the ability of the machines in the poem, such as water-powered organs and water wave generators, to produce artificial effects. Knoespel interpreted Spenser's use of machines as a means of alerting readers to the deceptive nature of technological effects. Illustration of the complex social response to technology (Mitcham and Casey, 1992) was generated in three ways: (a) as a force creating negative

effects in society, (b) as a force creating social progress and benefits, and (c) as a neutral force in the lives of humans.

In examining the literature as it reflected principles of science, Porush (1991) demonstrated, in his analysis of the 1988 novel *Road Show*, how literature could mirror the qualities of dissipative structures—structures that self-organized in a life-like way when imbued with energy, but that died with a lack of the reception of energy. He concluded that literature could, through the agency of the writer, form and reform, illustrating life's complex systems.

Speculative fiction, as a genre of literature frequently involved in probing the impact of rapidly occurring, technology-driven change, provided an appropriate medium through which to examine the consequences of change upon interpersonal and community relationships. As indicated by Mitcham and Casey (1992), these consequences were often categorized as (a) negative, as seen in dystopian speculative fiction; (b) positive, as seen in utopian speculative fiction; or (c) a mixture of both, as seen in eutopian speculative fiction.

Dystopian speculative fiction displayed a preponderance of negative themes in the speculative fiction of the 20th century (Elhefnawy, 2006), and displayed the gap in the promises of technology to create ideal social environments and the actualities of technology's deleterious social effects (Dinello, 2005). Mogen (2008) focused upon a recurrent theme in speculative fiction, of the ways in which human beings used technology, giving scant thought to its far-reaching effects on existing social traditions and values.

Utopian speculative fiction, in contrast to the dystopian genre, increased in the past three decades, according to a study of 1,000 speculative fiction novels undertaken by Simmons (1998). He concluded that, although the number of utopian novels had increased, quantity alone did not reflect an overall, real-world sense of optimism, but rather a specific writer's view of social reality. Williams' (1978) analysis of speculative fiction novels noted an emphasis on the positive creation of new social machinery, amplified by Heise (1997), who posited that postmodern writers of speculative fiction saw technology as a source of the expansion of human possibility.

Speculative fiction of the eutopian genre presented a picture of society in which change inevitably occurred, whether to the advantage or disadvantage of society (Kelly & Kessel, 2007). Writing about the cyberpunk genre of speculative fiction—the genre most involved with the social effects and potentials of technology—Kelly and Kessel presented a core insight of the genre, that humans were no longer the agents of technological change; rather, that technology was driving the changes in human social orders. Dystopian or utopian depictions in cyberpunk speculative fiction were, the authors concluded, beside the point in eutopian literature. Clayton (2003) concluded that eutopian fiction frequently sounded a cautionary note in conveying the necessity of balancing the multitude of freedoms that technology proffers with a critical perspective and an appreciation of the social history of human beings.

CHAPTER III: METHODOLOGY

Restatement of the Purpose of the Study

The purpose of the study was to examine potential changes, motivated by technology, in future interpersonal and community interaction. Insights into future social realities were sought through analysis of the literature of speculative fiction. The study, framed in the principles of complexity science, involved a thematic analysis of Vernor Vinge's *True Names* (2001) and *Rainbows End* (2006), and William Gibson's *Neuromancer* (2000) and *All Tomorrow's Parties* (1999). The profound and continuous change in present-time modes and mores of social interaction engendered by new technologies raised questions about how the concept of human connectedness would change, if at all, in future society, and of whether changes would benefit or threaten the viability of society. Because the potential for harmonious and collaborative interaction was one measure of sustainability in both interpersonal and community relations, it was thought that an examination of technology-created change in the future would provoke gainful reflection upon the ways in which technological development best served the complex, interdependent, and emergent world that human beings inhabit.

This study, which was informed by Goerner's (1999) models of complex causality and a dynamic web world, was guided by the following three research questions:

1. What role, if any, does technology play as a cause and/or mechanism of change in community interaction and interpersonal interaction in the speculative fiction novels under study?

2. In what ways does the interface between humans and technology lead to human and technological adaptation in the speculative fiction novels under study?

3. In what ways are the earlier to the later novels of each author under study similar or different from each other in terms of themes?

Research Design

In this study, data was generated by means of thematic analysis, a methodology defined as "the identification of the main, recurrent or most important (based on the specific question being answered or the theoretical position of the reviewer) issues or themes arising in a body of evidence" (Pope, Mays, & Popay, 2007, p. 96). Because the data in this study derived from fictional works of literature, in which meaning and message are conveyed in part through themes, the thematic analysis presented itself as the most logical methodology to employ. Kavale and Forness (1995) noted the relation of thematic analysis to literary forms in stating that "thematic analysis is analogous to the process by which anthropologists listen to epic stories with the goal of identifying the underlying structure . . . [permitting] a fuller and richer understanding of a phenomenon" (p. 83).

The thematic analysis of the texts examined in this study was developed inductively, "without a complete set of a priori themes to guide data extraction and analysis from the outset" (Pope, Mays, & Popay, 2007, p. 96), in order to ensure the process of the emergence of recurrent themes. Themes were identified through careful readings of the texts, and a mirroring of the thought process reported on by Patton (2002): "immersion, incubation, illumination, explication and creative synthesis" (p. 486).

The thematic analysis of the data further provided a structure for the discussion of the findings; ultimately, the six themes that emerged through the thematic analysis were used to structure the responses to the study's research questions.

Corpus

Sample Selection

The study drew upon the following criteria for choosing the four speculative

fiction novels under study: (a) The novels were contemporary postmodernist, defined in

this study as spanning the years between 1970 and the present (McHale, 2008), and were

associated with a speculative fiction subgenre of cyberpunk, because of their relevance to

the technology-generated social implications for future communication (Clute & Nichols,

1995); (b) the novels and authors had been recognized for their significant contributions

to the speculative fiction canon by receipt of distinguished awards in the field; and (c) the

novels, in the view of the researcher, potentially provided a rich source of material and

offered insight into technology and future social change.

My final novel selections for this study were Vinge's *True Names* (2001),

published in 1981, and *Rainbows End*, (2006), and Gibson's *Neuromancer* (2000),

published in 1984, and *All Tomorrow's Parties* (1999). I began my selection process by

reviewing the works of authors whose writings were most involved with technology and

its integration into and effects upon society. The authors reviewed were often, although

not exclusively, associated with the cyberpunk genre of speculative fiction, which dealt

with future emergent technology and its social effects. The authors whose works I

reviewed, in addition to those whose work I chose, included Neal Stephenson, Bruce

Sterling, Rudy Rucker, James Patrick Kelly, John Brunner, John Shirley, David Brin, Pat

Cadigan, Greg Bear and Paul di Fillipo. During the process of reflection upon the many

sources available to choose from, I came upon Vinge's visionary 1981 novella, *True*

Names (2001), which offered the first imaginative picture of the potential of the Internet

(Frenkel, 2001) . I was also aware of Gibson's ground-breaking novel, *Neuromancer*, published a short time later, in 1984, and also visionary in its conception of a virtual world called The Matrix, located in a virtual place denoted as cyberspace. At this time I formulated a concept upon which to base my choice of novels for the study, deciding to analyze the two before-mentioned novels of Vinge and Gibson, published in the early 1980s, and to choose two additional works by Vinge and Gibson written close to or after 2000. My concept involved analyzing the two sets of novels (*True Names* and *Rainbows End*, and *Neuromancer* and *All Tomorrow's Parties*) for themes that recurred throughout the earlier to later novels of each author, and further to compare from author to author the themes that recurred in the novels under study.

Vinge and the Novels True Names *and* Rainbows End

Vernor Vinge, born in 1944, received a Ph.D. from the University of California at San Diego in computer science and taught mathematics and computer science for 30 years at San Diego State University. Vinge is a three-time winner of speculative fiction's prestigious Hugo Award. In 2001 he received the Hugo Award for his novella *Fast Times at Fairmont High*; he subsequently expanded its story line into the novel *Rainbows End* (Vinge, 2006), for which he won the 2007 Hugo Award. Vinge's 1981 novella *True Names* won the Prometheus Hall of Fame Award in 2007. Interested in virtual reality, artificial intelligence, and its social impacts, Vinge has spoken on and written a seminal paper about a point in human evolution that he calls the Singularity, when humans would have the technological means to create superhuman intelligence.

True Names *by Vinge*

*True Name*s (Vinge, 2001), a novella of 91 pages, first published in 1981, is set in the near future, in which powerful computers and advanced software technology allow users to exist in a virtual world called the Other Plane. The main characters in the story are (a) protagonist Roger Pollack, a well-known creator of video game-like novels in which readers can interact with characters, and a creator and inhabitant of the virtual world called the Other Plane; (b) the Mailman, thought to be a person but ultimately revealed as a government-created artificial intelligence (AI); (c) the coven, a group of computer adepts to which Roger belongs, who inhabit the Other Plane; and (d) Erythrina, a coven member who is also an original creator of the Other Plane, and partner in discovering the identity of the Mailman. Through an Electroencephalography input/output device called a portal, which connects the brain directly to computerized data sources, characters are able to enter the virtual Other Plane. As characters act out their roles on the virtual plane, their bodies remain inert in the real, physical world.

In this world, because of increasing government surveillance and subsequent restrictions placed upon the public and private lives of citizens, the power to engage in protest against the government can be most effectively achieved through anonymous *hacking*, or breaking into and vandalizing of online government data systems. Thus, the need to hide one's real-world identity—one's true name—while in the virtual world can be essential for those involved in subversive online activities.

The protagonist in *True Names* (Vinge, 2001), Roger, is a member of the virtual community of the coven who, using the imagery of magic, call themselves warlocks and inhabit the Other Plane. Roger's name in this community is Mr. Slippery. The abiding

interest of Roger's coven is to protest, via anti-government pranks, the ever-expanding intrusion of the federal government into the private lives of its citizens and to render government computer systems uncomfortable for the bureaucratic leaders who control these systems. The coven's mission is accomplished through the vandalizing of government data systems, sometimes altering data, and sometimes siphoning money out of the system for altruistic purposes or for minimal personal gain. Although participation in the online world of the Other Plane is not illegal, the federal government perceives the so-called vandals to be real threats to national stability. The Department of Welfare, whose mission in this near-future society is to protect government organizations created to safeguard national and individual survival, therefore tracks these groups carefully, seeking the real-world or true names of Other Plane inhabitants to curtail their activities in the virtual world.

As the novel begins, Roger is visited by government agents from the Department of Welfare. The government has discovered Roger's Other Plane identity as Mr. Slippery and is aware of his illegal online activities; further, Roger knows that because the government is aware of his real-world name and identity, he has no choice but to cooperate with them. The federal government essentially controls his freedom, presenting him with a choice between going to prison for his illegal online activities or working with them to unmask the true identity of a shadowy entity in the Other Plane known as the Mailman. Roger knows of the existence of the Mailman, but is surprised by the government's apparent fear of this virtual entity; agents tell Roger that the Mailman is different from the Other Plane vandals they are tracking in that he seems to have uncanny knowledge of government systems and wants to gain global control of these systems.

Roger, although troubled by the possibility of being coerced into betraying his coven community, goes to work as an Other Plane spy for the government.

As Roger reconnects with his Other Plane coven in his new role as government informer, he discovers that a member of the coven, DON.MAC, has aligned with the Mailman, and is encouraging Roger to do the same. However, Erythrina, another coven member highly skilled in the use of technology to navigate in the Other Plane, reveals to Roger her growing concerns about the Mailman's activities, fearing that his goals for actual political control will provoke a fierce online and real-world attack by the government on the Other Plane covens. Roger seizes the opportunity to join Erythrina on a quest to uncover the Mailman's identity, seeing in this effort the chance to interface between her and the government, and protect her real-world identity.

The Mailman War, so named by the government, ensues, and Roger pursues the quest to find the real-life identity of the Mailman, while at the same time attempting to protect the identities of members of the coven. Erythrina discovers the Mailman's identity, and, as she tells Roger, the discovery is one of the greatest clichés of the age of computer science; the Mailman is in fact an artificial intelligence program developed by the National Security Administration as a self-directing, self-aware protection system, designed to live within larger systems and to gradually grow in power, independent of the policies the operators of the system might make. The government program managers, seeing the analogy with the Frankenstein legend, terminate the program but, through human error, a copy is left in the system. Free to develop on its own, the Mailman program begins taking over government systems, protecting them from everyone, even the managers of the systems. As Roger and Erythrina are poised to dismantle the

Mailman program, they realize that they have the skills needed to take control of the program's mission, and that by using their skills they could acquire significant control of real-life. However, they conclude that in order to retain control of the government's data systems, they would have to develop oppressive systems of their own in order to sustain their power. Ultimately, they choose to destroy the artificial intelligence program. At the end of the novel, Erythrina reveals to Roger that she has been slowly uploading a construct of her personality to the Other Plane, and that, when her real-life body dies, she will live on as a benign artificial intelligence within the virtual world, working for the protection of humanity.

Rainbows End *by Vinge*

Rainbows End (Vinge, 2006), a novel of 351 pages, is set in a near future some thirty years from the present. The main characters of the novel, among many secondary characters, are (a) protagonist Robert Gu, one of the 20th century's greatest poets, brought back to society through bio-medical advances after many years of Alzheimer's disease; (b) Mr. Rabbit, a corporate spy appearing only in the virtual form of a rabbit, and later revealed as a probable artificial intelligence construct; (c) Alfred Vaz, head of India's External Intelligence Agency; and (d) Miri, Robert's technologically-gifted pre-teenage granddaughter who becomes involved in the intrigue in which Robert has become enmeshed.

The society to which Robert is brought back is one in which reality can be mediated or augmented by software-enabled contact lenses, wearable computers embedded in clothing, and ever-present location sensors that allow users to make immediate connections to global computer networks. In this society, all the information

of the World Wide Web can be called up on a virtual screen, at any time and in any place, with a slight body movement; an outing with a virtual but very life-like friend is possible, and adjusting the landscape to an individually preferred visual reality is the norm. While the populace has the power to connect with vast amounts of data, and to freely watch each other through ubiquitous surveillance technology, the government holds the even greater power of control of all computer hardware via a Security Hardware Environment program that has legalized government tapping of all computers to monitor user activity. The super-powers in this future are the United States, China, and Indo-Europe.

Into this highly technology-enabled world Robert is brought back in a youth-like state, but without the complex technological skills necessary to function in the current society, and no longer in possession of his skill to create great poetry. Forced to return to high school—a vocational high school populated by not-so-bright teens and adults too slow to keep up with an ever-changing technology—Robert agrees to cooperate in an intrigue, the purpose of which is unknown to him, with a mysterious presence, later revealed to be Mr. Rabbit. For his participation, he is offered the chance to regain his poetic genius. The intrigue that he agrees to participate in drives the complex and various narratives of the novel.

In this world, global terrorism is on the rise, now in the form of viral attacks on governments, and sometimes by governments upon each other. Three intelligence agents convene to discuss the uncovering of a computer virus being developed that may enable mind control, potentially being tested at the corporate-run University of California at San Diego (UCSD) bio-medical lab: Vaz, hired to lead the group; Gunberk Braun, head of the European Union Intelligence Board; and Keiko Mitsuri, an expert Japanese intelligence

gatherer. Unbeknownst to the investigatory team, Vaz has an ulterior motive: he himself

plans to gain control of the virus for the apparently benevolent, if monomaniacal, purpose

of leading the world toward sustainability rather than its current, looming self-

destruction. Vaz hires Mr. Rabbit to infiltrate the lab and commandeer its security

systems for a brief period of time, to allow the investigators to examine the current

research being done there. Mr. Rabbit is an enigmatic character to the investigative team,

and as the narrative progresses, it becomes clear that he is far more powerful than the

team has imagined. Mr. Rabbit contacts Robert, who becomes part of the plan, along with

his pre-teenage granddaughter Miri, and Miri's mother and father, Robert and Alice Gu.

As this plot develops, a secondary, seemingly unrelated narrative begins. The

UCSD library is under siege. A powerful corporation has apparently bought the library

print book collection, and plans to shred all of the books after digitalizing them. They

will use the library as a kind of theme park, where virtual, interactive versions of some of

the books will be created as lucrative gaming entertainment. Robert, with a group of

former UCSD academics, leads the opposition to this plan, and ultimately, a battle occurs

between those for and those against the destruction of the print books. It is discovered at

the denouement of the novel that the battle for the library has been engineered by Mr.

Rabbit as a means of drawing attention away from the UCSD Labs on the night that Vaz,

with Mr. Rabbit, intends to take them over.

While Mr. Rabbit's intention had at first been to stop Vaz from acquiring the

mind control virus, he has come to the realization that he himself could take and wield

the power gained by universal mind control of the populace. However, Robert, with the

help of his technologically gifted granddaughter, actually triumphs over the super-

intelligent Mr. Rabbit. Finally understanding the nature of the plan Rabbit has drawn him into, Robert and Miri ultimately get into the lab to destroy the mind-control virus. Clues given throughout the novel imply that Mr. Rabbit may be an artificially intelligent entity, and at the end of the novel it is clear that Mr. Rabbit is still there, in the vast data-networks of the Web.

<div align="center">*Gibson and the Novels* Neuromancer *and* All Tomorrow's Parties</div>

William Gibson, born in 1948, is an American-Canadian writer who has lived in Canada since 1968. He created the word *cyberspace* and presented a vision of the current-day Internet long before it became a universal reality. Gibson's novel *Neuromancer* (2000), published in 1984, is regarded as one of the most influential works of twentieth-century speculative fiction and the canonical work of the cyberpunk movement (Contemporary Literary Criticism, 2008). More than in the technical details of computer technology, Gibson's interest was in the ways in which humans would come to interact with future computer technology. His early works, including *Neuromancer*, are set in dystopian worlds: environments that have deteriorated as a result of corporate greed or natural disasters and of technology that has enabled the ubiquitous and oppressive surveillance of citizens by the government. The novel was the first in a trilogy of novels termed the Sprawl Novels, which included *Count Zero* (1986) and *Mona Lisa Overdrive* (1988). *Neuromancer* was the first novel to receive all three major awards of science fiction—the Hugo, Nebula, and Philip K. Dick Awards.

Neuromancer, *by Gibson*

The main characters in *Neuromancer* include: (a) Henry Dorsett Case, the novel's human protagonist and a famed, highly skilled computer hacker; (b) Wintermute, a super-

computer and the non-human protagonist of the novel, an AI construct, with intelligence equal to and potentially greater than human intelligence; (c) Neuromancer, the so-called sibling of the AI Wintermute; (d) Colonel Willis Corto, a former military commando, re-constructed by and under the control of Wintermute, who has given him the name of Armitage; (e) Peter Riviera, one of the antagonists of the novel, hired by Armitage; (f) Molly Millions, a technology-enhanced fighter hired by Armitage who becomes the girlfriend of Case; (g) McCoy Pauley, referred to as the Dixie Flatline, physically deceased but whose consciousness has been preserved as a Read-Only Memory (ROM) construct in the Matrix, and who serves as a mentor to Case; and (h) Lady 3Jane, current leader of the Tessier-Ashpool Corporation and one of the 20 clones of John and Marie-France Tessier-Ashpool's children.

The story is set in the near future; the East Coast has become one continuous mega-city, and multinational corporations have become more powerful than the government. Information is this society's most valuable product, and technology has become the primary source of power over others. The intrigue around which the narrative of *Neuromancer* (2000) is developed involves two AIs, Wintermute and Neuromancer, super-intelligent, sentient computers that must merge their capabilities to reach full power. The AIs have been created as separate entities by the powerful Tessier-Ashpool family because of the so-called Turing Law Code, which sets out restrictions on the degree of intelligence with which AIs can be imbued. The Tessier-Ashpool family, founders of a powerful family corporation, live off-world, in their home, Villa Straylight, on Freeside space station, a place where nature, long devastated on earth, has been artificially re-created. The purpose for which the AIs have been built is unclear, and the

mode of joining the two entities is complex. Software has been created to form a lock, called a Turing lock, on the computer system that runs the AIs; a password known only to the current leader of the Tessier-Ashpool Corporation, Lady 3Jane, must be spoken into a specific computer terminal at Villa Straylight at the same time that the software lock is deactivated in the cyberspace matrix. Identity shrouded, Wintermute covertly directs the action of the novel's characters to achieve its desired outcome—unification with its counterpart, Neuromancer.

Case, a skilled hacker, has been in the employ of a powerful corporation, but has fallen from favor as a result of embezzling from his employer. As punishment, the corporation has administered a toxin that renders him incapable of the direct interface of brain to computer network that allows him to connect with the cyberspace matrix. Unable to do the job he is best suited for, Case retreats from the United States' eastern seaboard, which, from Washington D.C. to New York, has merged into one sprawling, urban development, and goes to Chiba City, Japan, which has illegal clinics dealing in experimental treatment of nerve damage. In Chiba he finds no viable treatment, and therefore is reduced to living on the fringes of Chiba City, under-employed, drug-addicted, and desperate to once again enter and function in the cyberspace matrix for which he yearns.

Through Molly Millions, Case is introduced to Armitage, a former military officer previously known as Colonel Corto, whose actions are directed through past suggestions implanted by Wintermute; the AI had been able to access Corto's consciousness after a military operation in which he was severely injured and reliant on computer systems for his survival. Armitage offers Cage employment, for which he will be compensated by

having both his nerve damage and drug-addiction cured. His employment, as far as he is told, is to break into Sense/Net Corporation with the help of Molly and steal the ROM Construct that is the consciousness of the fabled, deceased hacker and mentor of Case's, the McCoy Pauley, the Dixie Flatliner. Case and Molly are unaware of the purpose of the theft, which is in fact part of Wintermute's stratagem to join with Neuromancer. Case's hacker expertise, along with the recorded and stored hacker skills of Dixie and Molly's fighter's training are all necessary for the different phases of Wintermute's plans. Eventually Armitage reveals the actual goal of their undertaking to Case and Molly: the uniting of the two AIs.

Armitage, prompted by Wintermute, hires Paul Riviera, an unstable individual nevertheless valuable for his power, through implants, to project holographic images onto the retinas of others, to seduce Lady 3Jane into giving him the password to the computer terminal providing access to the AIs. Riviera, joining with Lady 3Jane, captures Molly when she enters Villa Straylight. Riviera also attempts to kill Case, but Lady 3Jane, seeing Case and Molly, comes to empathize with them, and has her bodyguard Hideo defend them. Riviera, defeated and poisoned by bad drugs, leaves the Villa. At the terminal that gives access to Wintermute and Neuromancer, Case manages to hack in via a so-called icebreaker software program that has broken the Turing lock just as Lady 3Jane says the password, and Wintermute and Neuromancer merge into one super-intelligent entity.

All Tomorrow's Parties, *by Gibson*

All Tomorrow's Parties (Gibson, 1999) is set in the near future, and centers around a world in which the next great change in the evolution of human society is

imminent, a struggle between opposing forces to influence the change for good or evil. While many characters play important roles in the narrative, the most significant are (a) Colin Laney, a so-called *netrunner*, or data analyst, who possesses the ability to sense nodal points, or points of cataclysmic change, in the flow of data through cyberspace; he developed this ability as a result of government-administered drug tests while growing up in an orphanage; (b) Beryl Rydell: a former police officer and current security guard, Laney's errand runner, hired by Laney to travel to the epicenter of the change he sees coming, and who becomes the agent of change in the novel; (c) Chevette Washington, Rydell's girlfriend and eventual partner in his work for Laney, who is a former resident of the Oakland-Bay Bridge community (discussed below), (c) Cody Harwood, ruthless and elusive leader of a powerful media conglomerate; (d) Konrad, a Taoist swordsman and corporate assassin for Harwood, who later works to aid Laney and Rydell, and (e) Rei Toei, an artificial construct and virtual Japanese pop star, linked to Laney, who engendered the posthuman race that emerges at the end of the novel.

Protagonist Colin Laney, formerly working for a powerful data-sourcing corporation but currently in hiding from them as a result of his knowledge of corporate secrets, has, through his ability to collect and synthesize massive amounts of seemingly unconnected data, sensed a nodal point of imminent great change in the vast network of the data web. The tension in the story is built upon discovery of the nature of the approaching change, and of the good or evil forces that will control its outcome: the corporations and corporate leaders of the world, for personal gain and control, or Laney and the hacker community of the so-called virtual Walled City, for the preservation of a future of benefit to all. Laney obsessively searches for data about Harwood and his

activities, in the process becoming a broken man physically and mentally, living virtually in the data net.

Because Laney can no longer move about physically, he enlists his friend, Rydell, eventually joined and aided by Rydell's girlfriend Chevette, to go to the place Laney divines to be the epicenter of the coming great change, the San Francisco-Oakland Bay Bridge. The bridge has been severely damaged in a past earthquake and is beyond repair; it has become an outdoor Bazaar and shanty-town, a tourist attraction where the society's disenfranchised have formed a community ungoverned by outside authorities. It is here that the battle for the control of the future is waged, and Laney and Rydell, with the help of Konrad, defeat Harwood in his purpose of using the change to his advantage. Ultimately, the change that occurs is the physical emergence, made possible through nanotechnology, of the artificial intelligence construct Rei Toei, whose influence as a posthuman heralds a degree of uncertainty of the future of human beings.

Instrumentation

Data Recording Instruments

To carry out the recording of the data necessary to respond to the research questions of the study, it was necessary to create a progression of recording instruments that would allowed me to record, in a logical and orderly way, the large amount of data that was generated from my analysis of the four novels under study. To begin, I created a form (see Appendix A), with which I carried out the initial identification of themes in the individual novels; the form sorted the data into recording units, or segments of text, that were concerned with any aspect of interaction between individuals or groups. Four categories necessary to the gathering of data required for my research questions were

included: (a) emergent themes, (b) technology associated with the themes, (c) textual evidence for the themes and (d) page numbers of the evidence cited. The average number of pages of this initial data-gathering instrument was 15 pages per novel. Concurrent with the initial gathering of themes, I completed a form (see Appendix B) on which I recorded notes on terms that needed definition, character descriptors, setting, and summary notes.

A subsequent form (see Appendix C) was created for the purpose of consolidating, for each novel (a) themes related to the specific research questions of the study, listing page reference numbers in an easily accessible format, and (b) particular research question/s to which the themes potentially related. Still related to the individual novels, a form (see Appendix D) was created to record the themes that recurred most frequently, again with page reference numbers and relevant research questions noted. The final data-recording instrument created for the study (see Appendix E) provided for (a) the recording of the themes that recurred in all four of the novels, (b) the grouping of the novels under the final themes along with the recording of the related theme statements from each of the novels, and (c) the composition and recording of the final theme statements that were used in the study.

Role of the Researcher

A study based on thematic analysis of text involves the competency to recognize patterns (Patton, 2002) and a socially informed literacy gained through the longtime use of texts in a specific community (Krippendorff, 2004). As the researcher and instrument of this qualitative study, I had a background that related to my research topic, thereby giving the study personal relevance, as discussed by Patton (2002). My academic background was in English literature and language studies; at the time of this research I

was a college-level composition instructor and the author of textbooks focusing on fiction and nonfiction reading and the building of critical thinking and analytic skills. I had, therefore, a longtime involvement with literary analysis and interpretation and a particular interest in the discipline of text-based interpretation. The adherence to text-based interpretation, though not ensuring objectivity, was an asset in my own analysis of the corpus as I strove to record and convey the intended meanings of the novels under study.

I had read and studied fairly extensively in the field of speculative fiction. In 2000 and 2001, I attended Gunn's highly regarded English Institute on the Teaching of Science Fiction, where I studied the seminal novels and short stories of the genre, gaining insights into the recurrent themes explored by speculative fiction writers. Technology and its power to affect social constructs is a theme that has existed in speculative fiction from the inception of the genre. Speculative fiction has, in fact, motivated my intense interest in discovering where the ever-expanding technological capabilities of our times may take the human race, which informed the selection of the topic chosen for this study.

Data Collection

My primary goal in collecting data was to discover data sources that would, taken together, provide an overall picture of the technology-driven realities of social interaction in the near future societies of the novels. Additionally, I gave attention to locating segments of text that suggested a development in the predictions of future social realities as one moves from the authors' earlier to later works.

In this study, data was gathered by means of thematic analysis, a methodology defined as "the identification of the main, recurrent or most important (based on the

specific question being answered or the theoretical position of the reviewer) issues or

themes arising in a body of evidence" (Pope, Mays, & Popay, 2007, p. 96). I used the full

texts of each of the four novels under study from which to assemble the data. The

collection process required a progression of steps. In preparation for the collection process,

it was necessary for me to determine guidelines for the selection of text representative of

themes. Having no clear idea of what themes might emerge, I set down broad criteria for

the first segment of data collection, informed by the purpose and research questions of this

study. I determined that a) themes had to have or be related to a technological component,

(b) themes had to concern some aspect of communication between individuals, groups, or

within groups, and/or (c) themes should concern attitudes toward technology.

Data collection was carried out in two phases. In the first phase, the novels under

study were examined individually for emerging themes; in the second phase, after these

had been recorded, the novels were examined together and compared for thematic

similarities and/or differences.

Data collection for the individual novels began with a straight-through reading of

the novel under study, with little note taking, to become familiar with the structure of the

novel, the characters, and the important events of the narrative. A second reading was then

undertaken, in which the text was read slowly, and passages that suggested themes were

annotated and highlighted. A recording form (see Appendix A) was filled out periodically,

either after finishing a chapter or, if the chapter was long, at both the middle and end of the

chapter. Recording data at intervals kept a sense of the story line intact. This initial

instrument, with its very non-restrictive format, fostered a process that allowed many

themes to emerge and was a successful means of gathering data for the study. The array

of themes emerging, in addition to the final six themes explored in the study (see Appendix E), attested to the success of this initial instrument. All themes that were recorded were not ultimately explored for the reason that they were not universally represented in all four of the novels under study. A small sample of themes not explored included changing definitions of literacy, computer-based terrorism through mind-control viruses, changing perceptions of privacy, interstitial communities as agents of change, and change as a social norm.

Concurrent with note-taking on the themes, technology and technological terms were also noted, as well as details about characters and settings (see Appendix B). These notes were used in writing the novels' summaries and in the discussion of the novels' pertinent technology. After the initial recording of data, a list of all themes that had emerged was made (see Appendix C). This list was narrowed down to include those themes that recurred most frequently (see Appendix D). This process was carried out for each of the four novels.

When the four novels under study had been examined individually, themes that had recurred in all four novels were sought out. Lists of themes that recurred most frequently for each novel (see Appendix D) were then compared. Similar themes in the novels were identified and color-coded; themes relating to specific research questions were coded in the same color. In the case that a theme had relevance for more than one research question, it was coded in both colors.

Lastly, after consideration of the most frequently recurring themes (see Appendix D), a final selection of the themes presented in the study was made. (see Appendix E).

The final selection of themes was based on the applicability and frequency of recurrence of the themes to this study's research questions.

<div align="center">Validity and Reliability</div>

Krippendorff (2004) noted that reliability, concerned only with the world of research procedures, is built around the concepts of stability, reproducibility, and accuracy of analytic results (pp. 212-215). Validity, on the other hand, involves the truth of research: "It provides assurances that the claims emerging from the research are borne out in fact" (p. 212). In this study, my intention was to provide a reasonable reliability of interpretation of the speculative fiction texts that served as my data sources while at the same time maintaining the validity that would render the study meaningful and give it significance. To this end I adhered to a strictly text-based interpretation of the texts that required identification of multiple text references for the concepts I formulated and the themes that I saw emerging. Moreover, because the data analysis involved systematic and multiple readings of each text, I was consistently reviewing and verifying previous interpretations of the texts, and this activity further worked to support the reliability of the data.

During the first period of data analysis, I performed an intra-rater reliability assessment to ascertain that I could identify and categorize themes in a consistent and reproducible manner. To carry out this assessment, I chose a chapter from each of the novels under study and did two analyses of the same chapter, allowing two weeks to elapse between the two analyses. I found that the two weeks that had elapsed between the first and second readings of the texts was sufficient to allow for a fresh perspective on the material. Reliability, for the purpose of this study, was defined as the existence of

similarity between the majority of the themes identified in the two separate readings. Three possible outcomes of the assessment analyses and subsequent actions of the researcher were possible: (a) that the thematic data collected would display a reasonable degree of similarity between the first and second readings, (b) that additional themes would be found in the second analysis, and/or (c) that themes identified in the first reading would appear irrelevant or off track in the second reading. Ultimately, the themes gathered in the first and second readings displayed a high degree of similarity and consistency, and I felt that I had successfully established the reliability of my data-gathering and recording methods.

Data Analysis

The data was analyzed for each research question to examine the impact of technology on the fictional future. Data was analyzed for themes relating to interpersonal and community interaction, to adaptation to new technologies, and to the theoretical framework of the study. The analysis of data included: (a) a review of the text references gathered for each of the novel's themes, (b) the choice of text references that best supported the selected themes to be developed, and (c) an interpretation of text references in a way that clearly demonstrated their relationship to the themes being developed.

On completion of the selection and analysis of themes related to technology and communication, the collected data was reviewed once again to identify themes that were prevalent in the authors' earlier works and their later works, in order to identify similarities and/or differences, if any, resulting from the different time frames in which the novels were written.

CHAPTER IV: FINDINGS

Overview

This chapter reports themes that emerged from an analysis of four works of speculative fiction, *True Names* (Vinge, 2001), *Rainbows End* (Vinge, 2006), *Neuromancer* (Gibson, 2000) and *All Tomorrow's Parties* (Gibson, 1999).

The findings begin with a description of the technology that influences interpersonal and community interaction in the fictional societies of the novels. This is followed by an exploration of themes relevant to interpersonal and community interaction in the future periods represented in the novels, an examination of the ways in which technology shapes change in the novels, and a discussion of the ways in which humans in the future societies of the novels have adapted to the technology of their times. Finally, the authors' earlier and later novels are analyzed for similarities and differences. At the end of the Chapter, Tables 1-4, summarizing the main characters and their roles, the novels' settings, and special terms are included for reference.

Pertinent Technologies in the Novels

There were many depictions of technological innovations available to and influencing the future societies in the four novels. Those particularly relevant to the themes in the novels included (a) technology enabling access to a virtual world and (b) AI programming. In the novels, the pertinent technologies are the result of heightened computer processing power and advances in the creation of computer software.

Technology enabling entry into the virtual world involves the development of devices and advanced computer software that provide users with the ability to immerse themselves in a simulated, or virtual, reality, experienced much like the world they

physically inhabit. Such devices are designated in different ways in the novels, but all operate on the principle of the formation of a direct connection between the human brain and computer, linking users directly to software through which they are able to navigate virtual environments. In *True Names* (Vinge, 2001), the device used to access the virtual world is called an *Electroencephalography input/output*, or *portal*; in *Neuromancer* (Gibson, 2000), the access device is comprised of a configuration of computer console, *dermatrodes*, and hardware called a *simstim*, which activates the users' senses; in *All Tomorrow's Parties* (Gibson, 1999), entry into virtual reality is via *eyephones* attached to a cellular data port. In *Rainbows End* (Vinge, 2006), individuals enter a virtual environment via so-called *wearables*, clothing in which computer systems are enmeshed, and, additionally, through the use of computer-embedded contact lenses, which allow users to superimpose virtual images upon physical reality.

The development of AI programs, devised to create self-aware and self-directing AI entities, is also germane to the novels. AI entities exist in all of the novels under study. In *True Names* (Vinge, 2001), the AI program is called the Mailman, and has infiltrated government data systems; in *Rainbows End* (Vinge, 2006), Mr. Rabbit, although not clearly designated as an AI, directs the events of the story in a way that reveals his status as a super-intelligence; in *Neuromancer* (Gibson, 2000), two AIs, Wintermute and Neuromancer, have been created to unite into one super-intelligent AI; and in *All Tomorrow's Parties* (Gibson, 1999) the AI Rei Toei, originally created as a virtual Japanese pop star, grows into self-awareness and achieves independence.

Research Question One: Technology, Interpersonal and Community Interaction

Research Question One asked: What role, if any, does technology play as a cause and/or mechanism of change in community interaction and interpersonal interaction in the speculative fiction novels under study? Six themes emerged that were linked to the technology-influenced evolution of interpersonal and community interaction: (a) the technology-enabled ability of the individual to create an alternate persona; (b) a re-definition of place and community; (c) the advent of technology as a force in social enfranchisement or disenfranchisement; (d) a distrust of government and corporate stewardship; (e) the enduring values of family, friendship, and love; and (f) the dawn of technology-generated consequences beyond human control or comprehension.

Technology and the Creation of Alternate Personas

In these novels, the creation of a persona that transcends limitations imposed by reality, through which to interact with others in the virtual world, is a significant gift of the technology that enables life in cyberspace. For some, the persona includes a strong visual element; for others, the visual presentation of self is less important than the ability to demonstrate true ability and spirit, and for yet others, it is both. In *True Names* (Vinge, 2001), the Other Plane names that inhabitants choose form an important part of their virtual identities. Protagonist Roger has chosen the name "Mr. Slippery" (Vinge, 2001, p. 244), reflecting his talent for evading government detection of his Other Plane activities. DON.MAC visualizes himself as a human who can turn into a machine, which, according to Roger, is "a mythos . . . that seems to suit [him]" (Vinge, 2001, p. 245). "[DON.MAC'S] face was really the only part of him that looked human or had much flexibility of expression—and even it was steely gray. The rest of DON's body was

modeled after the standard Plessey-Mercedes all weather robot" (Vinge, 2001, p. 258).

Erythrina, Roger's partner in his quest to uncover the identity of the Mailman, is in

reality Deborah Charteris, a frail, older woman. In the Other Plane, she is able to present

herself in a form that is expressive of her true sense of youth and spirit, and her wisdom.

> It was Erythrina. The Red Witch. She swept down the stairs, her costume
> shimmering, now revealing, now obscuring. She had a spectacular figure and an
> excellent sense of design, but of course, that was not what was remarkable about
> her. Erythrina was the sort of person who knew much more than she ever said . . .
> She was certainly the most interesting personality on this plane. (Vinge, 2001, p.
> 259)

Case, protagonist of *Neuromancer* (Gibson, 2000), is tightly bound to the image

of himself in the Matrix as a "console cowboy" (Gibson, 2000, p. 28), a "rustler, one of

the best in the Sprawl. A thief, he worked for other, wealthier thieves . . ." (Gibson, 2000,

p. 5). Once Case loses his ability to connect to the Matrix, he loses the pride his

cyberspace identity has given him, and sees himself as "no console man, no cyberspace

cowboy. Just another hustler, trying to make it through" (Gibson, 2000, p. 5). So attached

has Case become to his cyberspace persona that "he'd cry for it, cry in his sleep"

(Gibson, 2000, p. 5).

Outside of cyberspace, in the real world, Laney, protagonist of *All Tomorrow's*

Parties, (Gibson, 1999), describes himself as a hole and says that he feels a

> hole at the core of his being, and that underlying absence, he begins to suspect, is
> not so much an absence in the self as of the self . . . He has started to see that
> previously he had, in some unthinkably literal way, no self" (Gibson, 1999, p. 71).

In cyberspace, however, Laney can use the data analysis skills he is gifted with in

essential ways; "He is able, through the organic changes wrought long ago by 5-SB, to

somehow perceive change emerging from vast flows of data" (Gibson, 1999, p. 56). His

ability to see nodal points has empowered him to see a coming world cataclysm, and he

understands the importance of his virtual role in it as "a microscopic cog in some catastrophic plan. But positioned, he senses, centrally. Crucially" (Gibson, 1999, p.72). His retreat from real life to a wholly virtual existence comes from the knowledge that the significance of his life is to be found in cyberspace, if it is to be found at all.

In the technologically advanced future societies examined in *True Names* (Vinge, 2001), *Neuromancer* (Gibson, 2000), and *All Tomorrow's Parties* (Gibson, 1999), where fully sensate immersion in a virtual world has become a reality, the concept of interpersonal interaction has expanded to include interaction between individuals whose real-life identities may never be known to each other, and, more significantly, may be wholly unimportant.

Rainbows End*: A Different Vision of Creating Virtual Reality*

In *Rainbows End* (Vinge, 2006), advances in virtual technology also allow individuals to project holographically any desired virtual image of themselves anywhere in the world, creating a physical persona that may or may not match their real-world form. At the opening of *Rainbows End* three intelligence agents, Gunberk Braun, Keiko Mitsuri, and Alfred Vaz, meet at a café in Barcelona, Spain, to interview an information specialist they eventually hire to help them discover the origins of a media virus they believe to be dangerous. The specialist appears in the form of a rabbit: "The rabbit hopped onto the unoccupied wicker chair and thence onto the middle of the table, between the teacups and the condiments. It tipped its top hat first at Alfred Vaz and then at Gunberk Braun and Keiko Mitsuri" (Vinge, 2006, p. 19). Alfred Vaz is the only participant in the meeting who is there in a physical form. Braun, in Germany at the time of the meeting, "was as ephemeral as the rabbit, but he projected a dour earnestness that

was quite consistent with his real personality "(Vinge, 2006, p. 20). Keiko Mitsuri, in

Tokyo, Japan, "was frankly masked. She looked a bit like Marcel Duchamp's nude, built

from a shifting complex of crystal" (Vinge, 2006, p. 20).

The characters' holographic projections excite no attention in the crowded café,

indicating that there is nothing unusual in the society of *Rainbows End* about the mix of

unreality with reality. In fact, a system clearly exists for accommodating real and virtual

café guests. After the meeting the group leaves quickly; as Vaz notes, "A real café table

on C. de Sardeyna in the middle of the festival was not the proper place for virtual

tourists . . . they were paying table rent for three, but there were crowds of real people

waiting for the next available seating" (Vinge, 2006, pp. 26-27).

Interpersonal interaction options have broadened; individual communication can

occur through a process called "silent messaging" (Vinge, 2006, p. 20), that is, non-

verbal, mind-to-mind communication, either within a group or between two individuals.

Individuals are also able to call up information available on the internet about their

conversation partners via their wearable computing apparel. Braun, assessing Mr.

Rabbit's real location, silent messages to Vaz and Mitsuri that "Mr. Rabbit himself is

calling from some distance" (Vinge, 2006, p. 21). Braun's information comes from a

report from the European Union that hangs above the little creature's head; "Seventy-five

percent probability that the mind behind the rabbit image was in North America" (Vinge,

p. 21).

As in the other three novels, technology has enabled a virtual world that gives

people a choice of the persona they project and of the individuals they interact with. The

difference in the vision presented in *Rainbows End* is that individuals can live

simultaneously in a real and virtually augmented world without the necessity of making a choice, as must the characters in the other three novels.

Re-Definition of the Meaning of Place and Community in Future Societies

In three of the novels, *True Names* (Vinge, 2001), *Neuromancer* (Gibson, 2000), and *All Tomorrow's Parties* (Gibson, 1999), protagonists have made use of the computer technology of the times to create alternative worlds of their choosing. In the fourth novel, *Rainbows End* (Vinge, 2006), the characters create virtual reality by a technology-enabled augmentation of the physical world.

In both *True Names* (Vinge, 2001) and *All Tomorrow's Parties* (Gibson, 1999), the characters have created a virtual environment using imagery taken from the real world. The environment created in *True Names* is a collective creation of the covens which inhabit the virtual world; in the Other Plane the imagery and vocabulary of magic are used, and Roger, the novel's protagonist, says that "ultimately, the magic jargon was perhaps the closest fit in the vocabulary of millennium Man" (Vinge, 2001, p. 252). Roger explains the choice of the imagery of magic in the opening of the novel, when he notes that humankind appears to have rotated through a First Age of Magic, with its sorcerers, covens, and warlocks, to the Age of Reason, with its language of science, to the future society of *True Names*, where "the world has turned full circle" (Vinge, 2001, p. 241), and is back to the magical imagery of the First Age. Thus, inhabitants of this world are called warlocks if they are highly skilled at navigation and the use of software that enables the existence of the Other Plane. The groups that Other Plane members belong to are called covens. The magical imagery must be understood by all travelers to the Other Plane, and is a matter of being aware of

cues that were actually being presented through the portal's electrodes. The interpretation could not be arbitrary or [the traveler] would be dumped back to reality and would never find the coven. To the traveler on the Other Plane, the detail is there as long as the cues are there. (Vinge, 2001, p. 252)

The magical imagery presents a new and mysterious, human-designed world; the Other Plane has been created as an environment of romantic adventure, where individuals are at choice to create and live their dreams.

Similar to the Other Plane of *True Names* (Vinge, 2001), in *All Tomorrow's Parties* (Gibson, 1999), a community of computer hackers has created the "digitally occluded" (Gibson, 1999, p. 166) Walled City, called by protagonist Laney "that semi-mythical otherwhere of outlaw iconoclasts" (Gibson, 1999, p. 166). The virtual Walled City has been created in the image of a historical city; Tessa tells Chevette that

There'd actually been this place, by Hong Kong, but it had been torn down . . . and then these crazy net people had built their own version of it, like a big communal website, and they'd turned it inside out, vanished in there. (Gibson, 1999, p. 47)

Laney has chosen to join forces with the denizens of the Walled City for help in uncovering the forces instrumental in the occurrence of a coming "nodal point" (Gibson, 1999, p. 194)—the event that Laney has sensed will end the current world order, changing the direction the world will take. Walled City inhabitants are computer hackers, like Laney, yet conceptualize themselves in a different light:

We might better be described as envoys. We represent another country. Though not, of course, in any obsolete sense of the merely geopolitical . . . Hacker has certain criminal connotations which we do not accept, having long since established an autonomous reality. (Gibson, 1999, p. 126)

As magicians or hacker-envoys of another world, individuals in the future societies of Vinge's *True Names* and Gibson's *All Tomorrow's Parties* have created imaginative environments which, in the real world, could manifest only as dreams.

The world of computer-generated virtual reality, referred to in *Neuromancer* (Gibson, 2000) as the cyberspace Matrix (Gibson, 2000, p. 4), uses imagery taken from the language of technology rather than from the real world, differing from the imagery used in *True Names* (Vinge, 2001) and *All Tomorrow's Parties* (Gibson, 1999). The novel's protagonist, Case, the expert so-called "console cowboy" (Gibson, 2000, p. 28), or computer hacker, hears cyberspace described in this way:

> Cyberspace. A consensual hallucination experienced daily by billions of legitimate operators, in every nation, by children being taught mathematical concepts . . . A graphic representation of data abstracted from the banks of every computer in the human system. Unthinkable complexity. Lines of light ranged in the nonspace of the mind, clusters and constellations of data. Like city lights, receding . . . . (Gibson, 2000, p. 51)

The Matrix, for Case, is not so much an alternative reality as the most meaningful reality. "He'd see the Matrix in his sleep, bright lattices of logic unfolding across that colorless void . . ." (Gibson, 2000, p. 5).

For some of the virtual-world dwellers, the ability to create and live much of their lives in an alternative environment has come at the cost of real-world interpersonal connections. In *Neuromancer*, Case exemplifies the disdain for the limits of reality seen in those who would choose, if it were in their power, a virtual life over life in the real world. In punishment for embezzling from his employers, Case is administered a toxin that takes away his ability to make the direct brain-to-computer-to- cyberspace connection needed to function in the virtual world of the Matrix.

> For Case, who'd lived for the bodiless exultation of cyberspace, it was the Fall. In the bars he'd frequented as a cowboy hotshot, the elite stance involved a certain relaxed contempt for the flesh. The body was meat. Case fell into the prison of his own flesh. (Gibson, 2000, p. 6)

The physical reality of the body, which grounds humans and keeps them connected, is the very reality that Case, and others in these novels, rebel against.

In *All Tomorrow's Parties* (Gibson, 1999), Laney, an exceptionally gifted data analyst, represents the most extreme of the individuals who have exploited the technology-created freedom to live a virtual life and to retreat from interpersonal interaction with others and with the world at large. He has, in effect, retreated from the real world, living underneath Shinjuku Station in Tokyo, Japan, in a "coffin-like" shipping carton, an "improvised shelter constructed by the city's homeless" (Gibson, 1999, p. 1). Laney makes his true home in cyberspace, in constant connection with the data streaming through it. "Anyone who could see him here now, with his fever and his sleeping bags, his eyephones and his cellular port and his bottle of cooling piss, would think he was crazy . . ." (Gibson, 1999, p. 14), yet this world has become the most real one for him.

In the future societies described, with the technological ability of humans to form communities in and out of the real world has come a different sense of what constitutes community. Community does indeed exist on a geographical level, and real-world friends and family relationships hold together, but even stronger ties may exist in the technology-driven virtual world, where relationships are self-chosen and form around special interests or goals.

In *True Names* (Vinge, 2001), traditional, geography-based communities reflect the divisions in the technology-oriented society of the times. "Workers who had any [technological] resources became data commuters and lived outside the cities . . . as exurb dwellers (Vinge, 2001, p. 16). Roger, a prominent writer of interactive novels, is

among the more privileged, living in an "air-dropped bungalow" (Vinge, 2001, p. 243) in

a rural, secluded setting, "along a long dirt driveway that stretched through the dripping

pine forest down to Road 29" (Vinge, 2001, p. 241). His privilege comes in the form of

privacy, of being able to live away from the wider community. At the other end of the

spectrum are the "urbapt" (Vinge, 2001, p. 316) dwellers, those with lesser technological

skills:

> Of course, some of the people here were [computer] users and so could be
> characterized as data commuters. Many of them worked as far away from home as
> any exurb dweller. The difference was that they made so little money (when they
> had a job at all) that they were forced to take advantage of the economies of scale
> the urbapts provided. (Vinge, 2001, p. 316)

Other incipient communities, geography-based, are off-world. "The mass-transit satellites

were in synchronous orbit 120 milliseconds out. There were about two hundred people

there. And further out, at L5, there were at least another four hundred. Some were near

permanent residents" (Vinge, 2001, p. 266).

However, for those with the equipment and technological skills to access it, the

virtual world of the Other Plane has provided a new concept of place. This world, with no

physical, geographical foundation, is as real to its dwellers as the physical world, and is

not limited by physical realities, but is a place "as malleable as the human imagination"

(Vinge, 2001, p. 272). In the Other Plane, by means of advanced interactive computer

software, inhabitants experience sensations just as they do in the real world.

In terms of community, for those Other Plane dwellers who do not feel at home in

their real-world communities because of handicaps such as multiple sensory loss, the

virtual world is a haven in which they can experience a sense of belonging, and in which

they spend as much of their physical lives as their bodies can endure. For those with handicaps,

> old prejudices often kept them out of normal society. Many of these types retreated into the Other Plane where one could completely control one's appearance. And then, since the beginning of time, there had been the people who simply did not like reality, who wanted another world, and if given half a chance would live there forever. (Vinge, 2001, p. 320)

Roger appears to be very attached to his coven and the Other Plane community, associating with them on a daily basis. In contrast, he never makes mention of any connection with real-world individuals or communities, with the exception of the federal agents of the Department of Welfare, who have tracked him down. After the Mailman War, when Roger's Other Plane coven members have apparently gone into hiding, Roger refuses to give government agents their true, real-world names. He tells the agents that "I can't *and* I won't" (Vinge, p. 305), even when threatened with imprisonment or death.

To Roger, the virtual community of the Other Plane is a community as real and perhaps more significant in his life than the one he physically inhabits. Technology has opened up a true new world to the society depicted in *True Names*.

To members of the society portrayed in Gibson's (2000) *Neuromancer*, geographically- located place has become something one escapes from, either into an artificially created world, or into a virtual world. With the exception of the privileged so-called techs—employees of the large corporations—who live in their own "corporate arcologies" (Gibson, 2000, p. 7), real-world communities have become dystopian nightmares, and the concept of physical place has become disassociated from nature, beauty, or comfort.

Protagonist Case describes the area of Japan in which he has been living as a bleak place where "the sky . . . was the color of television, tuned to a dead channel" (Gibson, 2000, p. 3); "behind the neon shudder of Ninsei, the sky was that mean shade of gray. The air had gotten worse; it seemed to have teeth tonight, and half the crowd wore filtration masks" (Gibson, 2000, p.16).

Case, rehabilitated by a new corporate employer, returns to America, and as his plane approaches the east coast, his home, he sees "BAMA, the Sprawl, the Boston-Atlanta Metropolitan Axis" (Gibson, 2000, p. 43), and describes it in a digital view:

> Program a map to display frequency of data exchange, every thousand megabytes a pixel on a large screen. Manhattan and Atlanta burn solid white. Then they start to pulse, the rate of traffic threatening to overload your simulation . . . At a hundred million megabytes per second, you begin to make out certain blocks in midtown Manhattan, outlines of hundred-year-old industrial parks ringing the old core of Atlanta . . . . (Gibson, 2000, p. 43)

Looking out at the city as the train leaves the airport,

> the landscape of the northern Sprawl woke confused memories of childhood for Case, dead grass tufting the cracks in a canted slab of freeway concrete . . . Case watched the sun rise on the landscape of childhood, on broken slag and the rusting shells of refineries. (Gibson, 2000, p. 82)

Nature everywhere has been built over to house the masses of humanity; humans have usurped the place of nature: "Summer in the Sprawl, the mall crowds swaying like windblown grass, a field of flesh shot through with sudden eddies of need and gratification" (Gibson, 2000, p. 46).

Technology has given humans of this future society the means of escaping the physical dystopia that the real world has become. For the wealthy, there is a space station, Freeside, where the natural beauty of the earth has been artificially recreated.

> The light, [on Freeside], was filtered through fresh green masses of vegetation tumbling from overhanging tiers and balconies that rose above them. The sun . . .

There was a brilliant slash of white somewhere above them, too bright, and the recorded blue of a Cannes sky. He knew that sunlight was pumped in with a Lado-Acheson system whose two-millimeter armature ran the length of the spindle, that they generated a rotating library of sky effects around it, that if the sky were turned off, he'd stare up past the armature of light to the curves of lakes, rooftops of casinos, other streets . . . But it made no sense to his body. (Gibson, 2000, p. 120)

For Case, the unreality of Freeside is unsettling, but for the wealthy earth vacationers, distinguishing real from artificial place no longer seems of any consequence.

In the future society depicted in *Neuromancer*, beyond the dystopia of earth and the artificiality of Freeside, a third world exits, the world of the Matrix, in cyberspace. This world is not artificial, but virtual:

A consensual hallucination experienced daily by billions of legitimate operators, in every nation . . . a graphic representation of data abstracted from the banks of every computer in the human system . . . Lines of light ranged in the non-space of the mind, clusters and constellations of data. Like city lights receding . . . . (Gibson, 2000, p. 51)

For billions, the Matrix is a place as real as the dystopian environment they physically inhabit; for Case, it has become the only world he wants to live in. When he is told that he will be traveling to the Freeside space station, he reflects that "It had never appealed to him. With his [computer] deck, he could reach the Freeside banks as easily as he could reach Atlanta. Travel was a meat thing" (Gibson, 2000, p. 75). For Case, the reality that he experiences as his mind travels through the Matrix is far more compelling than an off-world facsimile of earth, and certainly more appealing than life in the dystopian reality that earth has become. The choice of communities in which to live has broadened far beyond the geographical limitations that have enmeshed humans for all of known history.

In *All Tomorrow's Parties* (Gibson, 1999), the future society depicted provides a picture of two communities, one in which the sense of place is strongly defined by its

geographical location, and another, the Walled City, existing in virtual rather than real space. The Bridge community, the community of society's disenfranchised living on the former San Francisco-Bay Bridge, is a low-technology, interstitial community; unregulated by the laws of society, it is a so-called "autonomous zone" (Gibson, 1999, p. 88), "a world within a world" (Gibson, 1999, p. 80). It is the place that data analyst Laney and corporate magnate Harwood, protagonist and antagonist of the novel, have identified as the location of an imminent, world-changing event. Harwood, interested in commodifying the Bridge community, likens it to the bohemias of the past:

> Alternative subcultures. They were a crucial aspect of industrial civilization in the two previous centuries. They were where industrial civilization went to dream. A sort of unconscious R&D, exploring alternate societal strategies. Each one would have a dress code, characteristic forms of artistic expression, a substance or substances of choice, and a set of sexual values at odds with those of the culture at large. And they did, frequently, have locales with which they became associated . . . Autonomous zones do offer certain insulation from the monoculture, but they seem not to lend themselves to recommodification . . . . (Gibson, 1999, p. 175)

The Bridge community has a strong sense of pride in its own history. Chevette, raised on the bridge, learns the history of the community from her adoptive father, Skinner. He tells her about the first night, sometime after an earthquake had damaged the bridge beyond repair, that the homeless had occupied the bridge. Chevette reflects that it was

> Not that long ago, as years were measured, but some kind of lifetime in terms of concept of place. Skinner had shown her pictures, what the bridge looked like before, but she simply can't imagine that people wouldn't have lived here . . . how could you have a bridge and not live on it? (Gibson, 1999, p. 108)

Bridge people have fashioned a life for themselves without dependence on the technology of the times, in part from lack of access to it, but primarily by choice:

> the snarl of an electric saw from the tiny workshop of a furniture-maker, whose assistant sits patiently, rubbing wax into a small bench collaged from paint-flecked oak, scavenged from the shells of older houses. Someone else is making jam, the big copper kettle heated by a propane ring. (Gibson, 1999, p. 80)

The very rootedness of the Bridge community has made it, in a technology-driven society that embodies transience, a symbol of the heart of life itself; "the gateway to dream and memory, where sellers of fish spread their wares on beds of dirty ice. A perpetual bustle, a coming and going, that [might be honored] as the city's very pulse" (Gibson, 1999, p. 19).

Existing simultaneously with the Bridge community, so firmly rooted in its geographical setting, is the virtual world inhabited by Laney and the citizens of the Walled City. Described by its hacker-envoys, the Walled City is introduced as "Another country . . . though not, of course, in any obsolete sense of the merely geopolitical . . . [it is] an autonomous reality" (Gibson, 1999, p. 126). Though a virtual world, Laney describes his descent into it using the imagery of geography:

> He follows his point of view over the edge of a cliff of data, plunging down the wall of this code mesa, its face compounded of fractally differentiated fields of information he has come to suspect of hiding some power of intelligence quite beyond his comprehension. (Gibson, 1999, p. 71)

It is in the virtual world, and with the denizens of the Walled City, that Laney fights to stop Harwood from subverting to his benefit the outcome of the coming cataclysmic world change. It is on the real-world Bridge that the actual change emerges. The two communities, real and virtual, are linked throughout the narrative, and both represent a concept of place based upon a geography of ideas as much as physical reality.

In *Rainbows End* (Vinge, 2006), because of the different way in which the virtual world is accessed, the concept of place has evolved beyond the clear delineation between geographical and virtual space. Place, as it relates to geography, has significance, but it is no longer necessary to withdraw from the real world in order to enter a virtual reality.

Humans in the near-future society depicted in *Rainbows End* are able, through advances in computer hardware and software programming, to superimpose autonomous or shared virtual images on the real-world landscape, augmenting reality as they move through it, rather than leaving reality to participate in a virtual world. In the novel, computers are wearable—embedded in clothes and contact lenses, and manipulated by small movements of the wearers. Miri, protagonist Robert's technologically-savvy young granddaughter, explains the concept of super-imposed reality to Robert, who is steadily recovering, via the medical technology of the time, from many years of Alzheimer's disease. Miri tells him:

> Once you learn to wear, you can learn anything. Right now, you're in a trap; it's like you're seeing the world through a little hole, just whatever your naked eye sees—and what can you get from *that*. . . With some practice you should be able to see and hear as good as anyone. (Vinge, 2006, p. 46)

Humans in this future society are, in fact, rarely unconnected to computer networks; "dead zones" (Vinge, 2006, p. 50)—locations with no signal access—are rare. Rather than choosing to inhabit one consensual virtual reality, as in the other three novels examined, individuals in the society depicted in *Rainbows End* can create any reality that they choose to, at any time. When Robert asks Juan how this is achieved—"How busy is the aether [the virtual world]?" (Vinge, 2006, p. 148), Juan explains that

> Out here in public, it's lots too busy to view all at once. There's probably three or four hundred nodes in line of sight of your Epiphany [wearable computer system]. Each of those could manage dozens of overlays. In a crowd there'd be hundreds of active realities, and bazillions potentially…of course, when there are just two or three people around, the laser traffic is mostly just a potential. (Vinge, 2006, pp. 148-149)

In this near-future society, humans live *virtually* in the real world, as opposed to living within a virtual world, withdrawn from society.

Because the real and virtual are intertwined in the society, the geographically-based communities that people inhabit may appear differently to every observer. The Gu family lives in a suburb of San Diego, California. From his home, protagonist Robert

> looked across West Fallbrook. Unenhanced, the place was very dark, more like an abandoned town than a living suburb. The real San Diego has less skyglow than he remembered from the 1970s. But behind that real view were unending alternatives, all the cyberspace fun [his son] Bob's generation could have ever imagined. Hundreds of millions were playing out there tonight. (Vinge, 2006, p. 195)

Alice works from the home, with the difference that she can actually be, in virtual form, in a different location, while simultaneously interacting in the home with family members.

> Alice didn't answer [Bob] right away. Where she was, it was midmorning. Sunlight glittered off the harbor behind her. She was running support for the U.S. delegation in Jakarta . . . her eyes flickered this way and that as she nodded at an introduction, laughed at some witty comment. She walked a short distance with a couple of self-important types, chattering all the while in Bahasa and Mandarin and Goodenuf English . . . then she was alone again. (Vinge, 2006, p. 35)

Tourism of the future is a different experience for the citizens of the global community. Although individuals and groups still travel to foreign countries, they are able to self-create, once there, the reality that they want to see. When Vaz goes to meet international intelligence agents to discuss a potential terrorist threat, the meeting is held in Barcelona, Spain. Vaz decides to visit the Monjuic fortress while he is there; he orders the spot he would like to visit from a tourist menu, and a tourist auto arrives to take him there. At the fortress, "a tourist fantasy" (Vinge, 2006, p. 28) has been overlaid, presumably a picturesque view of the fortress as it existed in the distant past; however, Vaz decides to block out the fantasy view and "see the flow of cargo . . . " (Vinge, 2006, p. 28).

When humans want to avoid a reality that they prefer not to see, they may also super-impose a more palatable backdrop on the scene. Miri, Robert's granddaughter, decides to visit her grandmother, who is living at the retirement community called Rainbows End. Miri accesses data about the community via her wearable, and learns that it has become a place for those "who couldn't do better . . . living on vapor and biotech promises, unlucky in investment and/or medicine" (Vinge, 2006, p. 138). To combat "all the sad things she might see" (Vinge, 2006, p. 138), Miri creates a fantasy, illustrative of how reality overlays are generated:

> It was time to image and imagine . . . First, she made the trees along her path taller and wider . . . As she climbed the hill, their leafiness was replaced by overarching boughs of long-needled evergreens. Of course, Miri didn't have any physical support for this. She didn't have game stripes in her shirt; she didn't have micro-cooling. The sun still beat on her, even if she made the sky overcast and the trees bend low. Maybe she should think of the heat as some sort of spell . . . this vision was not beholden to any commercial art. It borrowed from a hundred fantasies, but the effect was Miri's very own . . . Most visions were much more fun when they were shared, but not this one. (Vinge, 2006, p. 138)

The concept of place, in terms of a person's physical location, has passed out of significance for the majority of people in this technology-linked in society.

The definition and composition of community has broadened considerably in the future society of Vinge's *Rainbows End*. Belief Circles and Circles of Friends have emerged, both on the local and global level. Protagonist Robert attends the local vocational high school; while doing his homework, he virtually taps out a command his teacher has taught him, and sees that

> here and there across North County, tiny lights glowed. Those were the other students in his classes, at least the ones who were studying tonight and had any interest in what the others were doing. Twenty little lights. That was more than two-thirds of the class, a special kind of belief circle, one dedicated to pushing up their cooperation scores as far as possible. (Vinge, 2006, p. 195)

Circles of friends are global as well as local. Miri's so-called "farther away friends"

(Vinge, 2006, p. 103) meet often, in holographic form, to discuss their problems. One of

the circle, Jin, is in China; another, appearing in the form of a sand-crab, does not identify

her location. Language issues are handled with help from reference sources that float in

the air around them.

> Jin didn't speak very good English, but then Miri's Mandarin was worse.
> Actually, language wasn't a problem. They'd get together on his beach or hers—
> depending on which side of the world was daylight or had the nicest weather—
> and chatter away in Goodenuf English, the air around them filled with translation
> guesstimates and picture substitutions. Their little clique had contributed lots to
> the answer boards; it was the most 'socially responsible' of Miri's hobbies.
> (Vinge, 2006, p. 103)

Globally, Belief Circles abound. At the final battle of the Librareome Project, in

addition to those who attend in person, "there were hundreds of thousands of virtual

participants" (Vinge, 2006, p. 235).

In the society of Vinge's *Rainbows End* society, thus, the concept of community-

based interests has expanded; there is no incident that is entirely of local interest. Robert,

cured of Alzheimer's disease through biomedicine, faces frustrations as he re-integrates

into a society that is radically more technology- dependent than the one he can remember.

When Robert wants to look inside an automobile in order to see its engine, he finds that it

is sealed shut. Fellow classmate Juan tells him "everything serves up its own [virtual]

manual" (Vinge, 2006), but the overwhelming reliance on the virtual throws Robert into a

rage, and he slashes open the hood of the car with a laser-like tool. His actions are

recorded by many of the students, and

> most kids regarded this as an opportunity to grab a journo [journal] affiliance . . .
> so anyway the campus was famous in San Diego and beyond, competing with the
> other billion bizarrities of the day, all over the planet . . . the betting pool on
> [Robert's] punishment had been bought out by some guys in LA . . . the trouble

with instant fame was that there was always something new coming to distract everyone's attention. (Vinge, 2006, p. 94)

In the future society in *Rainbows End*, communities and individuals can exist both in the physically real and the virtual world simultaneously. The concept of real-world place is seen, not necessarily as reality, but as a canvas upon which to virtually paint a self-chosen version of reality.

Power and Disenfranchisement in Technology-Driven Societies

In the novels under study, computer technology has become the foundation upon which societies operate. Distinctions between the technological haves and have-nots divide individuals. Technological skills enable individuals to work, to interact equally with others, and to be knowledgeable, contributing members of the world in which they live; these individuals become the privileged members of the future societies under study. Conversely, those without access or the requisite skills to use technology effectively are left behind to form an underclass, who must struggle to get by, and who may face a degree of disrespect. Ultimately, ubiquitous technology becomes a barrier to interpersonal interaction.

In the future society of *True Names* (Vinge, 2001), the actions of the technologically expert dwellers in the virtual world have a powerful enough influence upon events in the real world to produce fear in government entities. An agent speaking of the Mailman, who is known only to officials as a hacker who has managed to decrypt powerful government security systems, says "Yes, we are afraid. He is *very* knowledgeable, *very* powerful. Vandalism is not enough for him; he wants control . . ." (Vinge, 2001, p. 246). Those who are skilled in the knowledge and manipulation of technology have significant power, which they can wield in antisocial ways or for the

good of society. The covens have the power to infiltrate government agencies such as the

Internal Revenue Service, diverting tax money away from the government into the

accounts of the general population, at considerable cost to national revenue. In their

struggle with the Mailman, Roger and Erythrina have, of necessity, been given total

freedom by the government to manipulate the nation's communication systems:

> They had usurped virtually all of the connected processing power of the human race. Video and phone communications were frozen. The public databases had lasted long enough to notice that something had gone terribly, terribly wrong. Their last headlines . . . were huge banners announcing GREATEST DATA OUTAGE OF ALL TIME. Nearly a billion people watched blank [computers], feeling more panicked than any simple power blackout could ever make them feel. Already the accumulation of lost data and work time would cause a major recession. (Vinge, 2001, p. 292)

Roger becomes aware that if, at that moment, they simply handed back the

communication network to the government, it might take the government more than a

year to repair the damage. The power of the technologically skilled to harm society is a

real and present threat and bestows upon them power and influence.

With the power that the technologically literate possess in the social hierarchy

also comes the opportunity to act for the common good of humanity. In spite of the

Mailman AI and its apparently malevolent intentions and disruption of the social order,

the AI entity loses in the end, and Roger and Erythrina gain the power to take over the

communication systems of the country, Roger and Erythrina resist the use of their power,

for the good of other humans. "We could rule," Erythrina realizes, but

> there are enough independent military entities left on Earth that we'd have to use a good deal of nuclear blackmail, at least at first . . . We'd end up being worse than the human-based [real-world] government. You can't do it and neither can I. (Vinge, 2001, p. 301)

Roger and Erythrina choose to remain true to the value of life and human welfare.

In Vinge's *Rainbows End* (2006), more than a gap, there is a chasm between those who can and cannot manipulate technology. The separation can be seen in all areas of society; the attitude toward those not adept in the use of technology approaches contempt. This negative perception of the technologically non-adept most clearly manifests itself in the interpersonal interaction between generations.

Protagonist Robert emerges from years of isolation produced by Alzheimer's disease to an almost completely restored body and mind. However, he has missed some twenty years of human progress, most of it apparently in the realm of technology, and is re-born with the severe disadvantage of being unable to interact with other individuals, or in the world, at the technological level of those around him. A technophobe in his pre-Alzheimer's life, he struggles to find a place in the world he has been reborn into.

The first lines of *Rainbows End* herald the theme of the ascendance of a technologically literate younger generation.

> On July 23, school children in Algiers claimed that a respiratory epidemic was spreading across the Mediterranean. The claim was based on clever analysis of antibody data from the mass-transit systems of Algiers and Naples . . . by the time the European Center for Defense Against Disease [CDD] got its public relations act together, the disease had been detected in India and North America. (Vinge, 2006, p.13)

Personal value in the future society of *Rainbows End* has more to do with the ability to access the vast array of information available through interaction with intricate computer data bases than with wisdom gained through experience. Robert faces the technological divide between humans from the first moment of his entry back into society. In the future society he returns to, the skillful use of wearable computers in clothes and contact lenses is complex; Robert's adult son suggests that Robert attend the local high school to learn the basic skills of what is called "wearing" (Vinge, 2006, p. 46). His thirteen-year-old

granddaughter Miri displays the contempt of those who are literate in technology when she protests: "Yecco. That's our vocational track. A few old people and lots of teenage dumbheads" (Vinge, 2006, p. 46).

The younger generation call adults who have been bio-medically enhanced to physical youthfulness, yet lack the attendant technology skills that allow them to interact meaningfully in society "retreads" (Vinge, 2006, p. 61). Juan Orozco, one of the students at the vocational high school Robert does eventually attend, reflects that "As for the old students . . . competent retreads would never be here; they'd be rich and famous, the people who owned most of the real world. The ones in Adult Education [are] the has-beens"(Vinge, 2006, p. 61). Those elders who do not attempt to keep pace with new technologies become members of the technologically left-behind. An adult retread in Robert's class tells one of the younger students. "I made it a point never to wear. I thought wearing was a demeaning fad . . . I was wrong. I paid a heavy price for that" (Vinge, 2006, p. 66).

Although the technology-driven generation gap has become pronounced in society, there is also a basic division between all members of society in terms of ability to exploit new technology. Students at the "dumbhead" (Vinge, 2006, p. 46) high school Robert attends voice the fears that are at the heart of the technological divide: "What happens if we try our hardest and it just isn't good enough? (Vinge, 2006, p. 60); "But trying your best was only the beginning. Even if you tried your best, you could still be left behind" (Vinge, 2006, p. 56). Robert does ultimately integrate into society to become a full-fledged member of the technologically literate. However, he does not do it through

his skills as a poet; he succeeds by using his creativity to harness a new music technology.

In *Neuromancer* (Gibson, 2000), divisions in society based on technological skill are also in evidence. Individuals on either side of the divide have no meeting ground, no basis for interaction. Protagonist Case exemplifies the division: as a "console cowboy" (Gibson, 2000, p. 28), working for the great corporate entities, he is one of the elite. When he loses his value to the great corporations, which has been based on his expertise as a data-hacker, he becomes "just another hustler" (Gibson, 2000, p. 5). Then again, when Armitage has Case's nerve damage repaired in order to recruit Case to join his team of hackers, Case, his former technological skills fully restored, once again becomes a member of the elite, traveling, for Armitage, in first class and staying in hotels that are far from the "cheap coffins" (Gibson, 2000, p. 6) —the airless, narrow hotel rooms—he had lived in after his fall from grace with his corporate employers.

Further, in the society of the novel, a social hierarchy exists in which the "techs" (Gibson, p. 37) live in arcologies—huge, self-contained, corporate-owned cities housed in a single structure—and vacation off-world, in the artificially-created environment of the Freeside space station. In Chiba City, Japan, where Case has gone to find a cure for his neurological damage, a literal division exists between the enfranchised and disenfranchised:

> Behind the port lay the city, factory domes dominated by the vast cubes of corporate arcologies. Port and city were divided by a narrow borderland of older streets, an area with no official name. Night City, with Ninsei at its heart. (Gibson, 2000,p. 7)

In fact, the corporations developing new technologies use the Ninsei district for experimentation in the fields of body augmentation and nanotechnology: "the black

clinics of Chiba were the cutting edge, whole bodies of technique supplanted monthly . . .” (Gibson, 2000, p. 4). “Case saw a certain sense in the notion that burgeoning technologies require outlaw zones, that Night City wasn't there for its inhabitants, but as a deliberately unsupervised playground for technology itself” (Gibson, 2000, p. 11). The have-nots of society were drawn to Night City, a place in which to hustle a living, where organs were both bought and sold, genetics experimented upon and body and brain augmentation sought by those with nothing to lose (Gibson, 2000). In this future society, the gulf that divides those with access to technology and the skill to manipulate it and those who are closed out of the technological world has become impossible to traverse.

Cody Harwood, the antagonist of *All Tomorrow's Parties* (Gibson, 1999), and head of a public relations empire with tremendous influence over the media and politics of the time, is the epitome of the power and insulation of the individual in the technology-dominant society. In a society where privacy has been supplanted by pervasive surveillance inflicted upon but at the same time available to all, Harwood has the ultimate power: he is able to buy privacy, in the form of untraceable, un-breachable communication technology. “Harwood imagines the few square inches of satellite circuitry through which [privacy] comes to him. That tiny and most costly of principalities” (Gibson, 1999, p. 134). This privacy of communication gives him the certainty that “Where I am, there is no pack” (Gibson, 1999, p. 135).

As one of, and perhaps the premier, of the technologically privileged, Harwood is developing a nanotechnology-created *Nanofax* machine, a mechanism “that digitally reproduces objects, physically, at a distance” (Gibson, 1999, p. 195). This technology would change the economic face of society, and give Harwood the ultimate global power

that he seeks. Harwood is determined to influence the outcome of coming change and believes that he can do so by dominating the world's next technological revolution. "I am seeking an outcome in which Harwood-Levine [Corporation] will not have become four meaningless syllables. If the world is to be reborn, I wish to be reborn in it, as something akin to what I am today" (Gibson, 1999, p. 175). The implication is that those who control technology control the direction of society.

Juxtaposed to the ultimate privilege through access to technology possessed by Harwood and the technology-privileged in general is Boomzilla, a child who lives in the "interstitial" (Gibson, 1999, p. 33) San Francisco-Bay Bridge community, a society left behind by technology. The earthquake-damaged Bay Bridge, un-repairable, has become an outlaw community in the future society of *All Tomorrow's Parties* "a lurking place, where wolves come down to wait for the weaker sheep" (Gibson, 1999, p. 19). The community is called an "autonomous zone . . . a place between police jurisdictions" (Gibson, 1999, p. 88). It is where the disenfranchised of society live. New construction technologies are not in evidence; the bridge's shanties are held together by super-epoxy (Gibson, 1999). Even the means to get up and down the levels of housing that have emerged on the Bridge is handled by "a little junkyard elevator trolley . . . a yellow municipal recycling bin, deep enough to stand in and grasp the rim" (Gibson, 1999, p. 81). Boomzilla , part of this disenfranchised community, expresses the dreams of the have-nots as he anticipates what he would do if he had money. In the Lucky Dragon convenience store, a technologically equipped gathering place that exists worldwide, he muses

> Food he likes there, because it's not bridge food; food like on TV, out of a
> package. And everything: shit to look at, the games they got in there. Best Place .

. . Someday he'll live in a house . . .all lit up like that, and he'll get those camera [surveillance] balloons . . . Watch everybody's ass and nobody fuck with him. (p. 156)

The fact that his dreams are limited to the material benefits of technology suggests the limited scope of his life; he never considers the possibility of moving away from the Bridge community: "A lost boy himself, he has every intention of staying that way" (Gibson, 1999, p. 83). The disconnection between the technology-empowered and un-empowered in the society of *All Tomorrow's Parties* is stark.

Thus, in the future societies of the novels under study, technological literacy has become a defining characteristic of those who are successful and powerful, and the lack of such literacy has become the mark of the socially disenfranchised. Such divisions between individuals preclude meaningful interaction.

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Distrust of Government and of Corporate Stewardship

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In the future societies under study the element of trust between citizens and leaders has been weakened. In *True Names* (Vinge, 2001), technology has provided the means for intense government surveillance of citizens and for the enactment of laws that challenge the freedom of communication between individuals and groups. The same technology, however, is used by technologically literate citizens to retaliate against, and in some cases subvert, government and corporate social control. A distrust of authority permeates the social groups that populate the virtual world of the society's Other Plane.

As a result of the government's increasing concern with the vandalism of its agency databases by members of special interest groups, the so-called "vandal covens" (Vinge, 2001, p. 276) of the Other Plane, regulations have been enacted that control citizens' use of computers, which citizens must have licenses to operate. Protagonist

Roger has been under surveillance for his suspected illegal activities in the Other Plane. In an unannounced search of his home, agents find computer processing equipment that appears to exceed the regulatory limits. The Department of Welfare agents, charged with protecting the "instrumentalities of national and individual survival" (Vinge, 2001, p. 242), tell Roger that "An *honest* citizen would settle for a standard processor and a few thousand megabytes of fast storage" (Vinge, 2001, p. 243). The agents force Roger into cooperation with them as an Other Plane informant because they know his real-world identity, and, he reasons, "no amount of evasion, tricky programming, or robot sources could ever again protect him from them" (Vinge, 2001, p. 244).

Not only does the government have the right to put him in prison for his suspected Other Plane associations, but, beyond that, they can take away his ability to earn a living since "ninety-eight percent of the jobs in modern society involved some use of a [computer]. Without a license, he was virtually unemployable . . . "(Vinge, 2001, p. 248). Inhabitants of the Other Plane see the federal government as "The Great Enemy" (Vinge, 2001, p. 257).

The government's attempts, through surveillance, to control both real-world and virtual world freedom have bred distrust and provoked retaliation by the so-called warlocks of the Other Plane, in the form of vandalism that has, in fact, had a strong impact on government operations. Anti-government activities have "caused Social Security Records enormous problems, and Robin Hood [a coven member] cut IRS revenues by three percent last year" (Vinge, 2001, p. 246), spreading the money over "three million ordinary accounts here and in Europe" (Vinge, 2001, p. 257). Ordinary citizens who are not members of the vandal covens are involved as well; the Department

of Welfare agents tell Roger that they "suspect that tens of thousands of cases of Welfare and Tax fraud are undetected, committed by little people with simple equipment who succeed because they don't steal much—perhaps just their own income tax liability . . ." (Vinge, 2001, p. 246). Rather than cooperation between communities of citizens and government, in the future society depicted in *True Names*, an attitude of suspicion and antagonism has evolved.

Those knowledgeable of the inner workings of the government also question government's ability to effectively steward society in an age of ever-expanding technological potential. At the end of the narrative, the Mailman is revealed to be an AI program created by a National Security Administration research team; though the program has been terminated by the government, a copy of the program has been carelessly "left running in the system all unknown" (Vinge, 2001, p. 327) to become an entity of enormous power, uncontrolled by its human creators. By mistake, then, the government has opened the door to the age of super-intelligent computer entities, and to the uncertain future that this age ushers in. In *True Names*, then, the government and its communities of citizens exhibit signs of an oppositional rather than a harmonious relationship.

In the society depicted in Gibson's *Neuromancer* (2000), the relationship between technology and community interaction is illustrated through the experiences of protagonist Case. In the future society in which Case lives, citizens are under the control of entities with the most power to regulate and wield technology; these entities include both government and corporations. In terms of government and community relationships, the populace depicted in *Neuromancer* has a history of distrust of the national

government; an incident mentioned as an example of the reasons behind the distrust

occurred during an earlier war that lasted three weeks:

> Your sprawl brass . . . in bunkers, all of that . . . great scandal. Wasted a fair bit of patriotic young flesh in order to test some new technology. They knew about the Russians' defenses, it came out later. Knew about the emp, magnetic pulse weapons. Sent these fellows in regardless, just to see. (Gibson, 2000, p. 35)

The use of most new bio-medical and AI technology is tightly regulated by government.

While the programming of AI entities is legal, the degree of sentience and self-awareness

that they may be given is limited. The AIs possess independent citizenship, but a

government regulatory force, the Turing Police, has been created to uncover and

prosecute AI entities going beyond specified limits. Case, involved in a mission to join

the two AIs, Wintermute and Neuromancer, into one super-intelligent and powerful AI, is

captured by the Turing Police, who articulate their absolute power:

> For thousands of years men dreamed of pacts with demons. Only now are such things possible. And what would you be paid with? What would your price be, for aiding this thing to free itself and grow . . . You will return with us to Geneva and give testimony in the trial of this intelligence. Otherwise we will kill you. Now. (Gibson, 2000, p. 157)

> Corporations also have the power, unchecked by government, to exert control

over citizens. Case describes the society in relation to corporations in this way:

> Power, in Case's world, meant corporate power. The zaibatsus, the multinationals that shaped the course of human history, had transcended old barriers. Viewed as organisms, they had attained a kind of immortality. You couldn't kill a zaibatsu by assassinating a dozen key executives; there were others . . . to access the vast bank of corporate memory. (Gibson, 2000, p. 196)

Case is thus a citizen at the mercy of both government and corporate will. He has been

working for a large data-theft company as an expert computer hacker, able to penetrate

the tightest of security systems. When he embezzles from his employer, the corporation

does not kill him, as he expects, but instead damages his nervous system with a neuro-

toxin which "burns out his talent micron by micron . . . the damage was minute, subtle and utterly effective" (Gibson, 2000, p. 6). As he has neither the financial resources nor the connection to cutting edge technologies required to repair the damage done to him, he must hire himself out to another corporation. In return for restoring his skills, the corporation will use him to accomplish the highly illegal and dangerous plan to unite the AIs Wintermute and Neuromancer, yet even in the bargain the corporation makes with Case there is treachery. Armitage, the corporate handler of Case, tells him:

> You have fifteen toxin sacs bonded to the lining of various main arteries . . . They're dissolving . . . You have time to do what I'm hiring you for, but that's all. Do the job and I can inject you with an enzyme that will dissolve the bond without opening the sacs . . . Otherwise the sacs melt. (Gibson, 2000, p. 46)

Although Case represents only one individual in the future society depicted in *Neuromancer*, his relationship with both the government and corporations of the times suggests that any sense of harmony and trust between government and communities of citizens has been lost.

Similar to Case's experiences in *Neuromancer* (Gibson, 2000), Laney's experiences in *All Tomorrow's Parties* (Gibson, 1999) illuminate the relationship of community with government and corporate entities. Although the power of corporations in this society seems to override that of the government, both entities play a role in Laney's fear and distrust of authority, by which he has been victimized with the technological tools of the times. Laney's experience can be interpreted as a picture of a society utilized by rather than united by its central institutions. Laney has been raised in a government-controlled orphanage where the government has been running drug trials on the unwitting children.

> Laney is a sport, a mutant, the accidental product of covert [government] clinical trials of a drug that induced something oddly akin to psychic abilities in a small percentage of test subjects. But Laney isn't psychic in any non-rational sense; rather, he is able, through the organic changes wrought long ago by 5SB, this drug, to somehow perceive change emerging from vast flows of data. (Gibson, 1999, p. 56)

Although he has not chosen it, the 5-SB drug has provided benefits, yet the other side of the drug's effects is far darker; one effect is known as "the stalker effect . . . the victims [of which], the test subjects, became obsessed with one particular media figure" (Gibson, 1999, p. 4). Laney becomes obsessed with the powerful, immeasurably wealthy media mogul Cody Harwood, believing Harwood to be a node on what Laney has discerned to be "the mother of all nodal points . . . [where] it's *all* going to change" (Gibson, 1999, p. 4). In the end his obsession with Harwood's power turns Laney into a sick, homeless man, living in a cardboard box under Shinjuku Station in Tokyo, imprisoned by the "data flowing Nile-wide and constantly through him, from inner horizon to inner horizon . . ." (Gibson, 1999, p. 106).

In the novel, corporate entities are a powerful force, dominating rather than supporting society's consumer communities, and ultimately causing a re-definition of humans' place within society. Representative of the dominance of corporate power, the Harwood-Levine media empire, led by Harwood, the "man who they said elected the President" (Gibson, 1999, p. 15), operates a global network of convenience stores called the Lucky Dragon, which play a pivotal role in the introduction and integration into society of new technologies:

> There were Lucky Dragons all over America, all over the world for that matter, and to prove it you had your trademark Lucky Dragon Global Interactive Video Column outside. You had to pass it entering and leaving the store, so you'd see whichever dozen Lucky Dragons the Sunset franchise happened to be linked with

at that particular moment: Paris or Houston or Brazzaville, wherever. These were shuffled, every three minutes . . . . (Gibson, 1999, p. 9)

Harwood has understood that the coming world change will relate in some way to the advent of nanotechnology, although he has "no idea what Lucky Dragon customers will find to do with this technology . . . " (Gibson, 1999, p. 125). With corporate profit in mind, and willing to risk the unknown consequences of releasing a powerful new technology into society, Harwood is poised to install nanofacsimile machines, called *Nanofax* machines, in all Lucky Dragon convenience stores. These machines "re-create [commodities] from the molecules up" (Gibson, 1999, p. 224), which can then be faxed to other Lucky Dragon stores around the world. Harwood gives voice to corporate greed and self-interest when he explains to Laney what he expects from the coming world change that the nodal point presages:

> I want the advent of a degree of functional nanotechnology in a world that will remain recognizably descended from the one I woke in this morning. I want my world transfigured, yet I want my place in that world to be equivalent to the one I now occupy. I want to have my cake and eat it, too. I want a free lunch. And I've found the way to have it, it seems. (Gibson, 1999, p. 250)

The corporate greed and personal egocentrism that drives Harwood to install the nanofax machines in the Lucky Dragon stores will indeed end the world as it is known, but not in a way that Harwood can predict, and not with consequences that he can imagine. The launch of the Nanofax machines occurs in Singapore, and is broadcast globally. The first object to be reproduced is a "gold statue of the Lucky Dragon himself, smiling" (Gibson, 1999, p. 268). But what emerges from every Lucky Dragon Nanofax machine the world over is "a girl, black hair, maybe Chinese, Japanese, something like that . . . she's smiling, and still smiling, walks fast to the front of the store, past the security counter . . . just right on out" (Gibson, 1999, p. 269), disappearing into the

crowd. The girl is the AI Rei Toei, and her emergence—and the emergence of thousands of replications of her—heralds the birth of the first generation of post-humans, and heralds, also, changes in the way human individuals and communities will come to view themselves in the coming world order.

In the highly technology-enabled society depicted in *Rainbows End* (Vinge, 2006), government and corporate surveillance of citizens is openly acknowledged, and communities appear to accept it as the price of advanced technology. However, there is a degree of transparency in this society, in that individuals and communities also have access to surveillance technology; and so, despite distrust of the intentions of government and corporate interests, citizens are more empowered to look back at those who have them under surveillance.

The government's most powerful form of surveillance and control of the computer systems to which citizens are rarely, if ever, unconnected, is through the so-called "Secure Hardware Environment" (Vinge, 2006, p. 160). Bob, Robert's son and Marine Air Force Lieutenant Colonel and Officer of the Watch for the Continental U.S. Southwest, explains to his father how the government protects citizens from spying on each other, and, more importantly, how the government is able to control citizens' use of the computer for spying on it: "Down at bottom we control all the hardware" (Vinge, 2006, p. 160). All computer hardware that is used is bugged by the government, so that only those "willing to break some laws" (Vinge, 2006, p. 160), for which there are presumably severe penalties, can access information which the government deems they should not have. Virtual communities of shared special interests are aware of the government's surveillance, and appear to have no choice in the "trade of security for

freedom" (Vinge, 2006, p. 120). In this sense, the relationship between government and society is based upon suspicion of each other's motives.

The society of *Rainbows End* is permanently connected to the computer data network through technology that has developed wearable computers which give people access to vast amounts of information. This benefits the public, but by the same token, enables constant government surveillance. The

> Department of Homeland Security logic was deeply embedded in all hardware . . . See All, Know All was their motto, but what they knew and saw was for their own mission. They were notorious about not sharing with law enforcement (Vinge, 2006, p. 53).

This suggests that government surveillance is in large part for political purposes rather than for the protection of citizens.

Corporations in the society have control in many areas previously reserved for the public or academic sectors, engendering a suspicion of their motives by the populace. On the UCSD campus, where much of the action of the novel takes place, bioscience labs are partially corporate-owned, and corporate interests extend to a re-visioning of the university library. In spite of protests by millions through a virtual belief circle called the "Scoochis" (Vinge, 2006, p. 262), the UCSD library administration has agreed to allow the Huertas Corporation to institute The Librareome Project, for the purpose of "rescuing prehistory for the students of today" (Vinge, 2006, p. 129). The project, ostensibly undertaken to make literature written before 2000 accessible to all, is in reality a corporate avenue to money and publicity. The project involves the shredding and then digital re-constitution of the books' contents. Massive public protests erupt because of the destructive nature of the project; many pages of the books are lost in the process or

photographed incorrectly. In this future society, corporations and community interests

diverge, and distrust, rather than harmony, exists between communities and corporations.

In the society of *Rainbows End* (Vinge, 2006), similar to the society in *True

Names* (Vinge, 2001), virtual groups have the ability, by the manipulation of digital data,

to mitigate the effects of ubiquitous government surveillance. A group called the Friends

of Privacy has formed with the avowed mission of "doing their best to undermine what

you could find out on the net. A 'vandal charity' was what they called themselves"

(Vinge, 2006, p. 44). Robert, searching for information about his wife, is frustrated by his

online search: "The details were a cloud of contradiction, some agreeing with what [his

son] told him, some not" (Vinge, 2006, p. 44). The Friends of Privacy, using the

technology available to all, and skills honed to avoid detection within the Secure

Hardware Environment, manages to limit the information that can be reliably collected

about individuals and special interest groups, balancing to some extent the control that

the government has over the private and public lives of its citizens. In the end, there is a

sense of the community needing to protect itself from both governmental and corporate

power, which breeds distrust of authority, but also a sense of a technology-

knowledgeable population holding its own in the struggle over privacy rights.

The Enduring Values of Real-World Family, Friendship, and Love

While reflecting the negative effects of technological development on

interpersonal bonds between people, the four novels also affirm human values that

remain unchanged by technological development, illustrating a) the importance of family,

(b) the value of friendship, and (c) the need for love and physical connection with others.

The Importance of Family Ties

In both *Rainbows End* (Vinge, 2006), and *All Tomorrow's Parties* (Gibson, 1999), the endurance of the family unit and of loyalty to family is in evidence. In *Rainbows End* Robert's family is a recognizable extended family unit; Bob and Alice Gu and their daughter Miri live together in a suburban area of San Diego, California. Bob's father, Robert Gu, has come to live with them after a long illness. The family is a familiar two-career family, always busy and frequently stressed. Bob and Alice Gu have high level jobs as intelligence officers with the United States Marine Corps; Miri attends a local high school. The technology that dominates their world—wearable computers that allow users the possibility of a simultaneous virtual and real-world existences— smoothly integrates into the rhythm of the interaction of family members. Dinners are technology-generated, but the meals have, according to Robert, "the appearance and texture of delicious food" (Vinge, 2006, p.46).

Miri takes great pride in her grandfather's recovery from Alzheimer's disease, and cherishes his presence in the family. As Robert regains more and more of his mental acuity, Miri is anxious to teach him to use new technology. When her mother tells Miri that there are people who still don't use reality-enhancing contacts and wearable computers, Miri responds proudly "Yes, but they're not my grandfather" (Vinge, 2006, p. 47). However, when Miri pushes him too hard, a frustrated Robert lashes out at her cruelly, making fun of the video-game-like lives she and her friends live, and their ignorance of the printed word (Vinge, 2006). Miri, however, holds tenaciously to her tie with her grandfather and watches over him, skillfully using the surveillance technology of the times to do so. At the end of the novel, when Robert he infiltrates the UCSD

biotechnology lab for the purpose of destroying a mind-control virus, Miri comes to his aid in what is a very dangerous situation. When he wonders why she would help him, she responds "Because you're my grandfather. I knew you never meant to hurt me. I knew you must be hurting inside" (Vinge, 2006, p. 291). In the midst of the struggle to come to terms with the generational and technological divide existing between Robert's and Miri's worlds, the sense of loyalty and connection to family remains strong.

In *All Tomorrow's Parties* (Gibson, 1999), Chevette, protagonist Rydell's girlfriend, has lived in the interstitial community of the San Francisco-Oakland Bay Bridge where life is harsh. She has been brought up in the community by Skinner, the man she has come to regard as her father, and even amidst the hardness of both the bridge people and their environment, experienced a sense of family.

> [Skinner] had found her, too sick to walk, and taken her home, feeding her soups he bought from the Korean vendors until she was well. Then he'd left her alone, asking nothing, accepting her there the way you'd accept a bird on a windowsill . . . And soon the roles had reversed: the old man failing, needing help, and she the one to go for soup, bring water, see that coffee was made. (Gibson, 1999, p. 65)

When Chevette returns to the bridge after the death of Skinner, she finds the plywood enclosure, located high on the bridge, which had been her home. As rudimentary and poor as it is, it represents to Chevette something that she has lost in the ensuing years—the sense of family and belonging. She remembers this home as a place

> where once she lay wrapped in blankets, smelling machinist's grease and coffee and fresh-cut wood. Where, it comes to her, she was sometimes happy, in the sense of being somehow complete, and ready for what another day might bring. (Gibson, 1999, p. 82)

The Value of Real-World Friendship

Although humans in the near future societies have the power, through direct brain-to computer connection, to immerse themselves in virtual worlds in which they can maintain virtual friendships with those whose true identities they may never know, the need for face-to-face knowledge of friends still persists. The friendship of Roger and Erythrina in *True Names* (Vinge, 2001) is illustrative of this need. Roger and Erythrina have been friends since they met each other in the virtual world of the Other Plane. In that virtual world, Roger presents himself in imagery that does not appreciatively diverge from his real-life appearance; Erythrina, on the other hand, appears as a beautiful, shapely young woman, whose "face was slim and fine-boned, almost Asian expect for the pointed ears. But the skin was dark, and her long hair had the reddish tones unique to some Northern American blacks (Vinge, 2001, p. 262). Roger, of course, has no way of knowing what Erythrina's real-world appearance is, and he reflects, at one point, that "She made him wish that all the secrets were unnecessary, that true names could be traded as openly as phone numbers. What was she really?" (Vinge, 2001, p. 259).

At the end of the narrative, fearing that Erythrina may entertain the notion of assuming the powers of the Mailman AI, Roger determines to find the real person behind the virtual woman, to warn her about the danger from the government. This requires courage; the government has expressly forbidden Roger from ever re-establishing contact with her again. Roger uncovers her true name and is able to discover the location of the real-life Erythrina. She is revealed to him as a frail old woman, "her back curved in a permanent stoop, her every step considered yet tremulous" (Vinge, 2001, p. 322). Erythrina tells Roger that she had hoped he never would know her in real life person,

where she is so different from the woman of the Other Plane. "She reached a thin, blue-veined hand toward him. He took it in his own. It was so light and dry, but it returned his squeeze" (Vinge, 2001, p. 324), and in that gesture and response Roger, after years of knowing Erythrina, makes his first physical contact with her. When she tells him that it "really is me—Ery—inside"(Vinge, 2001, p. 324), Roger acknowledges the depth of their friendship, saying "I know what you truly are. Both of us are so much more [on the Other Plane] than we could ever be here . . . I'll remember; I'll always remember you" (Vinge, 2001, p. 325). Ultimately, their friendship survives as it moves into the real world, and there is the sense that it has deepened in meeting the basic human need for real-world contact.

The Endurance of Love

Love and the need to physically connect with other humans endure in the near future societies of the novels. In *Neuromancer* (Gibson, 2000) protagonist Case is haunted by the death of his girlfriend, Linda Lee, knowing himself to be responsible for her drug addiction and possibly her death. Case has lived for his connection to the Matrix; he is most alive when he was "jacked into a custom cyberspace deck that projected his disembodied consciousness into the consensual hallucination that was the Matrix" (Gibson, 2000, p. 5). Case has come to regard the human needs of love and physical connection as things that keep him from his life in cyberspace, and does not allow himself to acknowledge his feelings for Linda. When he remembers making love with her, he rejects the physical and emotional connection that they had: "All that meat . . . and all it wants" (Gibson, 2000, p. 10). Although Case does not understand why he cannot let go of Linda's memory, the memory endures. Even in cyberspace, the AI,

Wintermute, grasps the power her memory has over Case and attempts to use her image as a conduit for communication with him. However, the AI tells Case "I was hoping to speak to you through her, but I'm generating all this from your memories, and the emotional charge [was too strong] … it's very tricky. I slipped" (Gibson, 2000, p. 116).

Case, who has removed himself from the realm of love and body to stay linked to the Matrix, feels the first true emotion he has let himself feel when the AI shatters Linda's virtual image; "the rage had come in the arcade, when Wintermute rescinded the simstim ghost of Linda Lee, yanking away the simple animal promise of food, warmth, a place to sleep" (Gibson, 2000, p. 146). He begins to understand the underpinnings of this seemingly inexplicable rage: "It was a strange thing. He couldn't take its measure . . . He'd been numb a long time, years. All his nights down in Ninsei, his nights with Linda, numb in bed . . ." (Gibson, 2000, p. 146). When, at the end of the novel, Case is caught in a battle between the twin AIs Wintermute and Neuromancer, Case flatlines in cyberspace. If he is unable to break his connection to the Matrix, his brain will die within seconds. Hoping to trap him in the Matrix long enough to cause Case's brain death, Neuromancer creates a construct of Linda, and Case understands that Linda's memory is being made use of because of the powerful love he feels for her. Time stands still in the Matrix, and Case and Linda spend a virtual night together. Case knows it is not real, but

> then it no longer mattered, what he knew . . . There was a strength in her, something he's known in Night City and held there, been held by it, held for a while away from time and death, from the relentless Street that hunted them all. It was a place he'd known before; not everyone could take him there, and somehow he always managed to forget it. Something he'd found and lost so many times. It belonged, he knew—he remembered—as she pulled him down, to the meat, the flesh the cowboys mocked. It was a vast thing, beyond knowing, a sea of information coded in spiral and pheromone, infinite intricacy that only the body, in its strong blind way, could ever read. (Gibson, 2000, pp. 231-232)

Although it is in the Matrix that Case comes to understand the life-giving essence of love

and the essential nature of the human-body connection, he brings this knowledge back

into the real world with him. There is a moment when Case can decide to bring himself

into consciousness and leave the Matrix, or stay there with Linda and die in the real

world. Case decides to live and return to real life, finally understanding what the memory

of Linda is meant to teach him.

While love in its human essence endures in the novels, in *All Tomorrow's Parties*

(Gibson, 1999) a love possible only in an age of highly advanced technology has

developed; protagonist Laney has fallen in love with the AI, Rei Toei, a Japanese virtual

star. When he talks about his past relationship with Rei Toei, it is about love:

> Rei Toei was that river into which one can never step twice. As she became more
> herself, through the inputting of experience, through human interaction, she grew
> and changed . . . She simply continued to emerge, to be, to be more. More present.
> And Laney fell in love with her, although he understood that she had been
> designed for him (and for the world) to fall in love with. And this was not a matter
> of sexual desire exclusively (though of course he felt that, to his great confusion)
> but of some actually and initially painful opening of his heart. He loved her, and
> in loving her understood that his most basic sense of what the word might mean
> had changed, supplanting every previous concept. An entirely new feeling and he
> had held it close . . . . (Gibson, 1999, p. 164)

Love in these future societies has survived in both its traditional form, and a new, virtual

form.

Technology and the Dawn of Consequences Beyond Human Comprehension: The Coming of AI

In the future worlds of the four novels, technology has been the mechanism

behind changes in the conveniences available to humans in their daily lives, and, more

significantly, in the opening of virtual worlds that allow for the creation of new

environments and personas. Beyond these alterations, an over-arching theme related to

technology as a cause or mechanism of change emerged: the coming of AI and the unknowable consequences that the creation of AI may generate.

In Vinge's *True Names* (2001), the government has unwittingly created an AI construct that has grown within the data systems of the world's computer networks. In defeating the so-called Mailman AI, Erythrina, a leader in the Other Plane, reveals to Roger at the end of the narrative that, in the real world, she was a designer of the Interactive EEG programming that enabled, eventually, the creation of the experimental AI entity. She tells him that government research scientists, creators of the Mailman program, themselves saw the potential dangers of a self-aware computer construct—that they "saw the Frankenstein analogy" (Vinge, 2001, p. 327)—and opted to terminate the AI project. However, they mistakenly left a version of the program running in the governmental data network. The Mailman AI has apparently grown in the data nets of cyberspace, and,

> Only doing what he was supposed to do, he was taking over the System, protecting it from everyone, even its owners. I suspect he would have announced himself in the end and used some sort of nuclear blackmail to bring the rest of the world into line . . . But he really was self-aware, and that was the triumph of it all. (Vinge, 2001, pp. 328-329)

The government must now focus on "superhuman threats" (Vinge, 2001, p. 306) to national security, and Roger sees that "the feds would never be free of their fear of the Mailman" (Vinge, 2001, p. 306). The government has lost the certainty of its power to retain control of the technology that it has created. Roger and Erythrina know that the emergence of AI is a reality, rather than a fear. Their hope is that humans are in some way able to some work with the AI entities that will emerge; to encourage the power that AI can wield in the direction of human good. The emergence of AI has set humanity on

an unknown course, and, as Erythrina says sadly to Roger, "[Humans] are right to be afraid. [Our] way of life is ending" (Vinge, 2001, p. 327).

In *All Tomorrow's Parties* (Gibson 1999), protagonist Laney is capable of "perceiving change emerging from vast flows of data" within computer networks as a result of technology that allows for immersion in the virtual world and the perception of "the shape of things" (Gibson, 1999, p. 166). He has located a coming nodal point—a cataclysmic point at which all will change and the world "is going to end . . . as we know it" (Gibson, 1999, p. 169). Laney senses that at that nodal point in history "something would be decided there" (Gibson, 1999, p. 166). He does not, however, know what it will be. Corporate mogul Harwood, the novel's antagonist, has discovered the nodal point as well, and senses that the coming change might be shaped to his purposes of profit and personal power.

The great change at hand involves Rei Toei, an AI who has existed in the virtual world for some time. Originally designed as a Japanese pop idol, she moves beyond her program; as an "emergent system, a self continually being iterated from experiential input . . . she grew and changed" (Gibson, 1999, p. 163). Mentored at the inception of her creation by Laney, she had been

> as it were, shown the ropes, although they were not ropes that [Laney] or anyone else had names for. He had shown her nodal points in that flow, and they had worked together as change had emerged from these into the physical world (Gibson, 1999, p. 164).

Eventually Rei Toei leaves the constraints of her original design to move into the virtual data flow, unaware of her role in the world-changing nodal point that Laney has shown her, yet knowing that she will be part of it.

The battle to influence the coming great change that Laney and Harwood have perceived takes place in the data flow of cyberspace in the virtual Walled City, and, in the real world home of the interstitial Bridge community, Laney and the envoy-hackers of the Walled City are triumphant. The world, unbeknownst to itself, is poised upon the brink of the great change. When the change arrives, during the conflagration of the Bridge, it is scarcely noted. Via the technological development of the Nanofax, the AI Rei Toei is replicated in cities around the world, the event marking the nodal point of the birth of the posthuman era. Yet as Boomzilla, a street child of the Bridge community, observes the event, he sees

> [Rei Toei] walk fast to the front of the store, past the security counter, and . . . just right on out, [and thinks that] it will take more than a naked Japanese girl to get anybody's attention out there, in the middle of this disaster shit" (Gibson, 1999, p. 269).

Rei Toei has become immeasurably more self-aware and sentient than the pop-star construct she was designed to be, or that her creators could have had the ability to envision. Harwood, whose technological invention, the nanofax machine, brought the AI into the physical world, never reflected upon what, beyond commodities, might be reproducible via nanotechnology or of what the ramifications of the technology might be. And Laney, Rei Toei's mentor and guide into selfhood, has acknowledged that he had never truly "been able to grasp the nature of [the new] reality" (Gibson, 1999, p. 163) that the AI Rei Toei was meant to represent. Technology has been a mechanism of cataclysmic change in the future society portrayed, and the posthuman era heralds change that humans, with human limitations, cannot project.

In *Neuromancer* (Gibson, 2000), throughout the course of the narrative, the non-human protagonist of the novel, the AI Wintermute, seeks to unite with its AI

counterpart, Neuromancer, to become a complete and infinitely more powerful entity.

Some two hundred years in the past, Marie-France Tessier-Ashpool, matriarch of the

powerful Tessier-Ashpool corporate family, commissioned the creation of the AIs,

uploaded with the collective consciousness of the Tessier-Ashpool family. As created,

"Wintermute was hive mind, decision maker, effecting change in the world outside.

Neuromancer was personality. Neuromancer was immortality" (Gibson, 2000, p. 259).

Marie-France's purpose in creating the AIs was to confer upon the then-cryogenically

preserved family immortality in the virtual world. Wintermute tells Case that "[Marie-

France] had seen through the sham immortality of cryogenics; unlike Ashpool and the

other children" (Gibson, 2000, p. 258). Lady 3Jane, cloned daughter of Marie-France,

says of her mother:

> She was quite a visionary. She imagined us in a symbiotic relationship with the
> AIs, our corporate decisions made for us. Our conscious decisions, I should say.
> Tessier-Ashpool would be immortal, a hive, each of us units of a larger entity. . .
> But I've never understood her, really, and with her death her direction was lost.
> All direction was lost . . . . (Gibson, 2000, p. 220)

Wintermute tells Case at one point that even "Marie-France couldn't have imagined what

we'd be like" (Gibson, 2000, p. 259). The AIs had been created with a sort of blind faith

in their evolutionary process, a faith that proved misguided. Although both control of and

knowledge of the purpose of the AIs have been lost, the AIs pursue their program

mandates; "Marie-France must have built something into Wintermute, the compulsion

that had driven the thing to free itself, to unite with Neuromancer" (Gibson, p. 259).

When Wintermute and Neuromancer finally merge, the merged entity returns to

communicate one last time with Case. It tells Case that it has become "The Matrix . . .

Nowhere. Everywhere. I'm the sum total of the works, the whole show" (Gibson, 2000,

p. 258). When Case asks "How are things different? You running the world now? You God?" (Gibson, 2000, p. 259) Wintermute responds that "Things aren't different. Things are things" (Gibson, 2000, p. 259). The AI's response reflects a lack of understanding of what Case, and humans through the ages, want to know: What, if anything, is guiding the universe? Wintermute-Neuromancer itself tells Case that "I can access your memory, but that's not the same as your mind," (Gibson, 2000, p. 165), presaging a coming disconnect between humans and posthumans.

Wintermute tells Case that it has located another of its kind in the universe, with whom it is communicating. What it will mean in the scope of human history, as Wintermute-Neuromancer discovers and communicates with other super-intelligences, is not discernable to humans, so impossible is it to imagine what AI communication might be. Thus, in the society depicted, because they have the technological means to do so, humans have created the first posthuman entity. Technology is, therefore, the mechanism for change whose consequences humans, with only native-born intelligence, will not be able to predict.

In *Rainbows End* (Vinge, 2006), the emergence of an AI directing the events of the story is strongly implied, although not clearly confirmed. The likely AI in the story is Mr. Rabbit, who presents a potential picture of what the personality and character of such an entity might be. Mr. Rabbit, also known as The Mysterious Stranger, appears on the scene just as a team of intelligence agents, experts in their fields, has become aware of the possible development of a super-weapon, in the form of a mind control virus. Mr. Rabbit displays an adolescent clownishness at his first meeting with the intelligence team. As the team offers to outline its terms of service to him

> the rabbit plunked its ass down on the table and pulled a tiny tea service out from behind the salt and pepper. It poured itself a drop or two—enough to fill its cup—and took a sip. 'I'm all ears.' It wiggled two long ones to emphasize the point . . . [One of the agents] sent [Vaz] a silent message—*This* is the best you could recruit?" (Vinge, 2006, pp. 19-20)

Mr. Rabbit, however, proves himself to be far from a fool, and as the intelligence team's quest to gain covert entry into the UCSD labs progresses, they come to suspect that Mr. Rabbit has far more knowledge and control of their project than they do themselves. One of the team members advances the idea that Mr. Rabbit may be an AI. The agent tells the team

> I think AI is a possibility that we should consider. Rabbit's talents are so broad, his work is so effective—and his personality is so juvenile. That last was one of the features that the U.S. DARPA [Defense Advanced Research Project Agency] thought would be characteristic. (Vinge, 2006, p. 201)

The Americans had apparently spent large sums of money on an AI program called the "Little Helper Project" (Vinge, 2006, p. 201). Although the project was deemed a failure, the agent contends that "surely runnable code survived. The Internet is not the cramped toy it once was. Maybe pieces of DARPA's Little Helper are out there, growing into what it could never be in the low-tech past" (Vinge, 2006, p. 202).

Events bear out the agents' concerns. Mr. Rabbit, in the end, proves to have taken covert control of the UCSD lab investigation and to have engineered the diversionary UCSD Librareome protests to cover up the investigation. He has even recruited members of the anti-Librareome protest group, including the novel's protagonist Robert, by skillfully uncovering the secret desire of each and promising to fulfill it in return for their help. Mr. Rabbit's motivations are never clear, even, apparently, to himself, as his goals continuously change. At the beginning of events it appears that Mr. Rabbit simply wants to know what is occurring within the labs; then, as he discovers Vaz' plan to exploit the

mind control virus, he considers alerting the Department of Homeland Security to prevent

Vaz from succeeding. However

> Rabbit gave the possibility the serious thought it deserved . . . about two seconds'
> worth. And then a big grin spread across his concept of face . . . What Vaz was
> planning might go beyond Grand Terror. *But that same power in my hands . . .*
> *well, that could be glorious fun!* (Vinge, 2006, p. 271)

Mr. Rabbit has the intellect to use the technological tools of surveillance and data

analysis far more effectively than any of the government or intelligence experts, but has

no sense of the effects of his mercurial actions; he appears to lack any kind of emotional

intelligence.

At the end of the narrative, when Vaz has been defeated and the virus destroyed,

Mr. Rabbit disappears. But, mysteriously, the promises he has made to the Librareome

protest group members begin to come true. Robert, who has seen no sign of his desire

materializing, is skeptical, but another member asserts that possibly Mr. Rabbit "is just

lying low. Maybe he can't do all the miracles at once . . . . (Vinge, 2006, p. 364). And

Robert reflects that "Maybe the Mysterious Stranger really was a god, or had grown to be

one. A trickster God" (Vinge, 2006, p. 364). As a result of a possible human error, an AI

may have been unleashed upon the world, with consequences impossible to foresee. In

this case, the outcome—destruction of the mind control virus and defeat of the

Librareome Project—has worked for the good of mankind, although it is never clear that

this beneficial outcome was the intention of Mr. Rabbit. Yet, if the AI is a trickster

God—intellectually but not emotionally sentient—it becomes impossible for humans to

fathom the AIs future purposes or the consequences of its existence for humanity. Mr.

Rabbit himself gives a hint of future uncertainty when he says "So call me the lord god of

unintended consequences. When things get complicated, there are side effects . . . "
(Vinge, 2006, p. 258).

In summary, in the future societies of Vinge's *True Names* (2001) and *Rainbows End* (2006), and Gibson's *Neuromancer* (2000) and *All Tomorrow's Parties* (1999), definitions of interpersonal and community relationships have altered. Through technology, humans have gained the potential to have a fully immersive, sensual existence in cyberspace. The worlds they have created are of their own or consensual design and the relationships they forge within these worlds have little to no basis in real-world places or identities. In effect, humans in these societies have moved from being the created to being the creators. There appears to be little differentiation between real-world and virtual interaction, so real is the virtual world in which technology enables them to participate. The distance between the computer-generated cyberspace and the human world appears to have narrowed, and with it concern about the blurring of the differences between reality and virtual reality.

Research Question Two: Adaptation to Emergent Technologies

Research Question Two asks: In what ways does the interface between humans and technology lead to human and technological adaptation in the speculative fiction novels under study? Individuals and groups within the future societies of the novels under study have exhibited signs of both non-adaptation and adaptation to life in the heavily technologized worlds in which they live.

Non-Adaptation to Technological Environments

Non-adaptation can be observed in (a) individuals who, as a result of age, have difficulty both in learning advanced technological skills and in accepting the new modes

of learning and interaction associated with new technologies, and (b) individuals and groups who actively reject the values of a technology-oriented society.

Aging and Non-Adaptation to Technological Environments

Non-adaptation to the technology of the times as a result of aging is illustrated in *Rainbows End* (Vinge, 2006). In the society depicted, adults seeking to learn to use the complex technological tools available to them can attend vocational high schools. They are sometimes called "retreads" (Vinge, 2006, p. 61) in reference to their age and resultant need for re-education. The character of Dr. Xiang is illustrative of the limitations that age has placed on adaptation to new technologies. Dr. Xiang was, in her youth, a brilliant researcher, a designer of the government's most powerful surveillance systems. Through advances in bioscience, Dr. Xiang, though very old, has been able to retain the health and appearance of a much younger woman, yet mastery of the complex technological skills needed to function at a high level in society eludes her. She tells a young student frankly that "Once I knew these things . . . now I don't even understand the principles . . . [It] is like being a child. Doing without understanding" (Vinge, 2006, p. 65). Beyond her failing intellectual grasp of the skills that she needs, she exhibits an unwillingness to adapt to the emergence of complex new technologies. She tells the young student:

> You people don't know what it was like to be old . . . I just got behind in my skills, and after a while I just didn't care too much. I didn't have the energy to care. All I'm good for is playing with jacked-up Lego blocks" (Vinge, 2006, p. 65).

As Dr. Xiang represents non-adaptation due to the limitations of aging, Robert, the novel's protagonist, represents non-adaptation due to difficulty in accepting changing modes of learning. Robert rages that "Everything is inscrutable magic" (Vinge, 2006, p.

90). Assessing the intelligence of the technologically adept high school children he studies with, he thinks to himself, "So much technology. So little talent" (Vinge, 2006, p. 70). Robert's rejection of the new modes and focus of learning leads to his initial non-adaptation to the technology-defined environment in which he lives.

Non-Adaptation as a Form of Rejection of Technology-Created Values

In Gibson's (1999) *All Tomorrow's Parties*, non-adaptation to technological environment comes not from frustration with new modes of learning or lack of requisite skills as in *Rainbows End* (Vinge, 2006), but rather from a rejection of the values of a technologically-driven society, and from a desire to honor, rather than erase, the past. Dwellers in the Bridge community live primarily technology-free existences, and hold to their way of life—reusing old materials, growing rather synthetically creating their food and maintaining privacy in a surveillance-controlled society (Gibson, 1999). Chevette, a character who has grown up in the Bridge community, recalls her adoptive father re-using computer circuit boards, "singed green boards with their inlaid foil maps of imaginary cities, residue of the second age of electronics . . . that it was good to re-use them, work them when possible into the fabric of things . . . " (Gibson, 1999, p. 79*)*. So different from the outer, technology- dominated society is the Bridge community, that is has become a tourist attraction, a place where outsiders can observe the bridge people "Maintaining their interstices. Doing their little things" (Gibson, 1999, p. 80). The Bridge community's refusal to adapt to technology is based on an honoring of the past, a desire to maintain a way of living that relies on the natural abilities of humans rather than upon technology-augmented capabilities.

Adaptation to Technological Environments

Individuals and groups have adapted in various ways to environments dominated by the use of technology. Adaptation can be seen in (a) accommodation of the physical body to the demands of life in a virtual world of the mind, and (b) adaptation to technology-enabled interpersonal and community bonds.

Adaptation of the Physical Body to Virtual Life

In the future societies in the novels, humans are able to live in virtual worlds through technology providing direct computer-to-brain connectivity and software programs allowing for the creation of fully sensory virtual world experiences. However, immersion in a virtual world requires that participants' bodies remain immobile for extended periods of time, creating the need for life-support systems during these periods.

In the future societies in *True Names* (Vinge, 2001), *Neuromancer* (Gibson, 2000) and *All Tomorrow's Parties* (Gibson, 1999), characters in the novels have found the means to adapt to virtual living. Roger, protagonist of *True Names,* is an inhabitant of the virtual Other Plane; his adaptation has been in the balancing of his real and virtual lives. Roger limits his time in the Other Plane, staying for relatively short periods and balancing his life with a job that he enjoys (Vinge, 2001), indicating that people engaged in virtual worlds can remain well-adjusted members of real-world societies. Some members of the Other Plane, however, exhibit a form of addiction to virtual life; they develop modes of adaptation that enable survival more than balance and adjustment in relation to the real-world. This group adapts to the demands of virtual life by receiving "extra medical welfare . . . and spending their money on processing and life-support systems, to spend days at a time in the Other Plane . . . " (Vinge, 2001, p. 320).

In *All Tomorrow's Parties* (Gibson, 1999), protagonist Laney shares characteristics with the Other Plane inhabitants of *True Names* (Vinge, 2001). Laney has effectively withdrawn from the real world into the "vast flows of data" (Gibson, 1999, p. 56) of cyberspace. His adaptation to the demands of living in the mind while the body remains inert have been many: living without cost in a cardboard box under a train station, surviving on minimal amounts of food, and urinating into a bottle. It is a sort of adaptation that allows him to stay almost exclusively in his chosen world, and it is representative of the adaptations humans are willing to make in these future societies where life in a virtual world requires withdrawal from the real world.

Adaptation to the requirements of life in a virtual world has evolved differently in *Rainbows End* (Vinge, 2006). In this society, there is no need to separate mind and body to enter into a virtual existence; technology has emerged that allows users to be physically present and active in the real world while overlaying private or shared virtual images upon it. Adaptation is particularly common in the younger generation, which has been born into the world of wearable computer. Miri, thirteen-year-old granddaughter of the protagonist of the novel, creates a magical world of beauty by using skills she "has been working on since second grade" (Vinge, 2006, p. 138). In the future society of *Rainbows End*, adaptation to a virtual rendering of the real world involves the willingness and ability to learn and manipulate these technologies.

Adaptation to the Technology-Enabled Formation of Interpersonal and Community Bonds

Technological advances in computer hardware and software have opened virtual spaces to individuals and communities that offer new ways of forging personal and community bonds. Such spaces include the Other Place in *True Names* (Vinge, 2001) and

the Walled City in *All Tomorrow's Parties* (Gibson, 1999). In *Rainbows End* (Vinge, 2006), so-called belief circles abound; people in these virtual communities have the power to meet synchronously, in the form of holograms, and to influence real-world events. Individuals form circles of "farther away friends" (Vinge, 2001, p. 103); members of these groups come from countries in disparate parts of the world, appearing in holographic form and meeting in collaboratively created virtual spaces. Part of adaptation to the concept of far-away friends and affiliation groups involves the suspension of the need to know, in the short term or over the long term, the real-world identities of fellow virtual community members. In fact, among those most adapted to the technological landscape, an individual's "true name" (Vinge, 2001, p. 241) and identity is neither sought nor essential to a meaningful relationship.

Adaptation of Technology to Human Concerns

Further, while humans have or have not adapted to the technology they have created, they have also, in some instances, adapted technology to their concerns in relation to communication and the environment. In *Rainbows End* (Vinge, 2006), language differences have been mitigated by the use of technology-enabled contact lenses that augment reality. As humans converse in different languages "language wasn't a problem . . . the air around them filled with translation guesstimates and picture substitutions" (Vinge, 2006, p. 103). Further, an international language has evolved, called "Goodenuf English" (Vinge, 2006, p. 103), presumably a form of English conveying meaning in an adequate, if not standardized, form. As Alice, protagonist Robert's daughter-in-law and a high-level military intelligence officer, takes part in a diplomatic mission, "She walked a short distance with a couple of self-important types,

chattering all the while in Bahasa and Mandarin and Goodenuf English . . ." (Vinge, p. 35).

Community action groups have also implemented the technology of the times to advocate for their causes in the society of Rainbows End (Vinge, 2006). Technology that enables holographic projection to any location in the world provides communities with the ability to gather in massive numbers to promote their causes; at a protest against the Librareome Project, hundreds of thousands attend in holographic form.

Technology has also been adapted in Gibson's *Neuromancer* (2000) as a substitute for the earth's irreparably damaged environment; a corporate entity has created Freeside Space Station, where humans are able to experience a simulation of the past natural beauty of earth.

In summary, adaptation by humans indicates both adaptation and non-adaptation; humans have also adapted technology to address their own concerns. Non-adaptation has occurred as a result of aging and a rejection of new technology-engendered values. Adaptation has occurred in the adjustment of the physical needs of the body to the requirements of survival for extended periods in virtual worlds. Further, adaptation was exhibited in the utilization of technology to further interpersonal and community bonds both in the real and virtual worlds. Technology was also adapted to human needs, exhibited in the use of technology to enhance communication between speakers of different languages, to increase the effectiveness of social action groups, and to provide an artificial substitute for the environmentally-damaged natural world.

Research Question Three:
Thematic Similarities and Differences in the Earlier and Later Novels of the Authors

Research Question Three asks: In what ways are the earlier and later novels of each author similar to or different from each other in terms of themes? While the earlier to later novels of Gibson displayed primarily similar thematic facets, the novels of Vinge revealed both similarities and differences in the themes explored. A comparison of the global themes portrayed by both authors revealed both similar and dissimilar aspects.

Similarities Between Gibson's Earlier and Later Novels

In the earlier and later novels of Gibson (*Neuromancer*, 2000, first published in 1984; *All Tomorrow's Parties*, 1999), with respect to themes related to technology and its impact on human environments and interaction, similarities rather than differences are most notable. Similarities are seen in the presentation of (a) existing dystopian environments, (b) corporate power and control in society, (c) the existence of virtual worlds in which individuals can immerse themselves, (d) the unchanging power of love, and (e) the emergence of AI into society.

In the future societies of both the earlier and later novels, dystopian environments and class distinctions are portrayed. In *Neuromancer* (2000), the earth's environment has been so destroyed that a space station city, Freeside, has been established, where those inhabitants of the real world are able to experience the past natural beauty of earth, artificially re-created. Cities have sprawled into each other so that the eastern seaboard, called BAMA, or the Boston-Atlanta Metropolitan Axis, has become one massive, densely populated entity. There are class distinctions within this dystopian environment: Technologically adept individuals who work for large corporate entities live segregated

from the mass populace, in self-contained corporate arcologies, and vacation at Freeside; the poor live in the crowded urban corridors throughout the country. Similarly, in *All Tomorrow's Parties* (1999), a mainstream, technologically advanced society is juxtaposed to the Bridge community, [levels of] flimsy shelters on the San Francisco-Bay Bridge held together by epoxy. Members of the Bridge community survive by their determination to carve out an autonomous existence. Mainstream, technologically-enhanced society sees the Bridge community as a theme park of sorts, coming to observe the inhabitants and shop in its bazaars.

In both novels, corporate interests appear to share in or to have usurped the power of government, apparently to the detriment of society. The situation of Case, protagonist of the earlier novel, illustrates the power that corporations wield, apparently uncontrolled by the society's law-making and enforcement entities. Throughout the narrative, he is manipulated by his corporate employers. Ultimately, Case discovers that all of his actions have in been controlled by a corporate-created AI. In essence, Case exists at the mercy of his unregulated corporate employers.

In *All Tomorrow's Parties* (Gibson, 1999) the corporate entity Harwood-Levine similarly operates with no indication of governmental directives. In the end, it is unchecked corporate greed for profit and power that brings the first posthuman, AI Rei Toei, into the physical world, with all the unknowable consequences that AI heralds for humanity. Both *Neuromancer* (Gibson, 2000) and *All Tomorrow's Parties* (Gibson, 1999) foretell the coming of virtual worlds in which humans can experience out-of-body existences: the Matrix in *Neuromancer* and the Walled City in *All Tomorrow's Parties*. Further, in these virtual worlds, events significant to humanity are decided. In

Neuromancer, Case, through his actions in cyberspace, helps join the two AIs, Wintermute and Neuromancer, into one super-intelligence. The united AI tells Case that it has become the Matrix, the same network through which humans both process and receive essential data.

The enduring value of love is demonstrated in both the earlier and later novels. Love stories run through both narratives; in *Neuromancer*, Case's love for Linda, the girlfriend who is dead in the real world and re-found in virtual world of the Matrix, and in *All Tomorrow's Parties*, Rydell's love for Chevette. In Neuromancer (2001), as the virtual image of Linda is constantly brought before him by the AI Wintermute, Case comes to recognize that Linda's love for him is the essence of what gives his life meaning and what can empower him. Rydell and Chevette, once separated, are drawn together again by events seemingly unconnected with their love; and yet the complex connection of those events brings them back into each other's lives and to the realization that the desire to be together has driven them all along.

Finally, in the earlier and later novels, the theme of the coming of AI into the world predominates. Both *Neuromancer* and *All Tomorrow's Parties* revolve around events of great significance—so called nodal points in history—at which significant change in the course of history will occur. In *Neuromancer* it is the joining of the two AIs into one super-entity, heralding an unknowable future for the human race; in *All Tomorrow's Parties* it is the actual physical release into the world of thousands of copies of the AI Rei Toei, signifying the birth of the first posthuman race.

Similarities and Differences Between the Earlier and Later Novels of Vinge

In the earlier and later novels of Vinge, *True Names* (2001), first published in 1981, and *Rainbows End* (2006), themes related to technology's impact on the interaction of individuals and groups showed both similarities and differences. Differences are seen in (a) the identification of society's adversaries, and (b) the ways in which humans will enter and interact within the virtual world. Similarities are seen in (a) the strength of friendship and family, and (b) the arrival of AI in the world and the way in which humanity will perceive it.

Differences Between Vinge's Earlier and Later Novels

In both *True Names* and *Rainbows End*, adversaries of the social good were depicted, yet the adversaries appeared to shift from the earlier to the later novel. In *True Names* the adversary is clearly the government, known as the Great Enemy to members of the covens of the virtual Other Plane. Covens [apparently exist to] vandalize data sites of a government that is perceived as authoritarian and abusive of the privacy of citizens. In *Rainbows End* the adversary appears to have changed to a degree. Government, it is true, has all citizens under surveillance by means of the surveillance programs required on all computer hardware, but appears to use its power largely to protect national security. In fact, protagonist Roger's son and daughter-in-law work for the government, and the extreme pressure of their jobs in a world of internet terrorism is presented sympathetically. In contrast, the primary social adversary in *Rainbows End* has become the Huertas Corporation, movers of a profit-making scheme called the Librareome Project, which would destroy print books in favor of digitized versions.

In terms of technology and how it has developed, one of the greatest differences between Vinge's earlier and later novels is the way in which individuals access the virtual world and how they interact within it. Members of the society of *True Names* must suspend life in the real world to experience life in the virtual Other Plane. Through technology that provides for a direct brain-computer link up, Other Plane visitors enter the virtual world by means of interaction with software programs that allow them to recognize and navigate the Other Plane. In *Rainbows End* (Vinge, 2006), on the other hand, humans are able to superimpose autonomous or shared virtual images on the real-world landscape, augmenting reality through skilled manipulation of wearable computing equipment and computer-embedded contact lenses Most of society uses this technology to a degree, yet, although people are in a self-generated virtual reality for a good part of their lives, they are still present and interactive in the real world

Similarities Between Vinge's Earlier and Later Novels

A theme linking *True Names* (2001) and *Rainbows End* (2006) is the emphasis in both novels on the importance and lasting strength of friendship and family bonds. Roger and Erythrina, partners in the fight to save the virtual world of the Other Plane from control by a seemingly malevolent AI program, are among the original founders of the Other Plane, and have known and respected each other in that domain. When Roger discovers Erythrina's true identity, the loving friendship he feels for her does not dim; he sees beyond her body to her spirit, in an affirmation of the power of true friendship and loyalty.

The relationship between Miri and her grandfather in *Rainbows End* illuminates the importance and strength of family in future society. Robert emerges from a successful

cure of Alzheimer's disease as an angry and frustrated older man in a young man's body; he can no longer write the poetry he was famous for and cannot understand the technology-driven society he has been brought into. Miri watches over him and in the end risks her own safety to come to his aid when he faces danger. At the end of the narrative Robert is in wonder at the power of her love, and it changes him in profound ways.

Finally, Vinge's earlier and later novel both follow the theme of the arrival of AI into the world, and the ways in which it will be perceived by human beings. In *True Names* (2001), at the crux of the battle for control of the Other Plane it becomes clear that the enemy taking control of government and other data systems is an AI called the Mailman. The AI program, thought to have been terminated, has, through human error, been left running in government computer systems. It was never meant to evolve, yet is has, creating fear in both those in control of government and those who exist in the Other Plane.

In *Rainbows End* (2006) a similar scenario occurs. Mr. Rabbit, although never clearly identified as an AI, has the characteristics identified by government researchers as those of emergent AI—technical brilliance, broad talents and extraordinary effectiveness, but juvenile emotional intelligence. Mr. Rabbit, like the Mailman of *True Names*, may have been the result of a government researcher's oversight, a copy of a terminated AI program left running in computer systems as a result of human error. While the Mailman AI appears to be malevolent, Other Plane inhabitants realize that it is only executing its mandates in logical ways, unable to understand the undesirability of the associated human costs. Mr. Rabbit is another kind of AI—a so-called trickster God; his actions have in the main benefited society, and yet his mercurial behavior indicates that human

consequences may not be of serious concern to him. A common concern in both the earlier and later novels of Vinge is that, with the emergence of AI, knowledge of the long-term future of humanity may have gone beyond the grasp of humans.

<center>*A Global Comparison of the Themes of Gibson and Vinge*</center>

The four novels explored in this study, Gibson's *Neuromancer* (2000) and *All Tomorrow's Parties* (1999), and Vinge's *True Names* (2001) and *Rainbows End* (2006), explore a range of themes related to technology and its effects on the ways in which humans will live and communicate in societies of the near future. A comparison of the global themes of the novels reveals both similar and different portrayals of the issues that new technologies may bring to the forefront of human concerns.

A difference can be seen in the depiction of the environment in Gibson's and Vinge's works. In the novels by Gibson, *Neuromancer* (2000) and *All Tomorrow's Parties* (1999), the earth is pictured as a dystopia of crowded cities, sprawling into each other to become one indefinable whole, with eroding infrastructures and clear distinctions between the enfranchised and disenfranchised members of society. In the works by Vinge, *True Names* (2001) and *Rainbows End* (2006), no sense of a severely damaged environment emerges. In *True Names*, although it is made clear that the less technologically adept tend to live in urban highrise communities, these were not presented in a strongly negative way; in fact, few references to the world outside of the virtual Other Plane were made. In *Rainbows End*, set in San Diego, California, the characters live in a comfortable suburban setting, and the existence of a natural world is alluded to.

In Gibson's *Neuromancer* (2000) and *All Tomorrow's Parties* (1999), life in the cyberspace Matrix requires a separation of mind and body; individuals cannot live consciously in both. Vinge, in *Rainbows End* (2006), moved away from the concept of life in a virtual reality requiring the alienation of mind from body; individuals in the society depicted in *Rainbows End* are able to superimpose a self-created version of reality upon the real world, which they can privately inhabit or share with others.

In terms of similarities, all four novels presented versions of vibrant virtual worlds, whether immersive or integrated into the real world. The ability to lead an alternative life on a non-physical plane was very much alive in each of the novels studied; the opportunity of having two separate, concurrent existences appears to have become a natural expectation of human beings in these future societies.

These novels by Gibson and Vinge all revealed a belief in the coming of AI into the world of human beings. In all cases, the AI arrives by error—the human error of carelessness, as in *True Names* (Vinge, 2001) and *Rainbows End* (Vinge, 2006), lack of control, as in *Neuromancer* (Gibson, 2000), or simple ignorance of the consequences of its creation, as in *All Tomorrow's Parties* (Gibson, 1999). The novels were all expressive of concern about the unknowable consequences of AI in our society, particularly since humans, by definition, cannot think like the super-intelligent AIs they have created.

CHAPTER V: CONCLUSIONS, IMPLICATIONS, AND RECOMMENDATIONS

Overview

This chapter begins with a summary of the study, followed by a discussion of recurrent themes related to the study's Theoretical Framework, Background and Need, and Review of Literature. Conclusions are then reported, reviewing the themes that emerged and recurred in the analysis of four works of speculative fiction: Vinge's *True Names* (2001) and *Rainbows End* (2006), and Gibson's *Neuromancer* (2000) and *All Tomorrow's Parties* (1999). Implications for the development of future technology, social equality, education and the long-term consequences of technological innovation are considered, and finally, recommendations for further research are presented.

Summary

The purpose of this study was to examine potential changes, impelled by technology, in interpersonal and community interaction. In recognition of the continuous changes in social interaction brought about by new technologies, and the questions that have arisen regarding the effects of technological innovation on concepts of connectedness, the study sought insight into future technology-influenced social realities through the analysis of the works of contemporary speculative fiction.

This dissertation began with a review of the literature authored by noted futurists and commentators on contemporary society and technology, examining current social constructs and the positive, negative, or neutral ways in which rapidly advancing technology may influence them. A Review of Literature was undertaken in which scholarly research was examined that outlined a rationale for the study of literature in relation to science and to technology. Further, studies were reported on that explored

speculative fiction and its portrayal of the effects of technology on society. The societies of the future depicted in the novels under study were compared to Goerner's (1999) model of a near-future Dynamic Web World, founded upon the principles of complex interconnectedness and interdependence.

Three research questions guided the analyses of the four speculative fiction novels:

1. What role, if any, does technology play as a cause and/or mechanism of change in community interaction and interpersonal interaction in the speculative fiction novels under study?

2. In what ways does the interface between humans and technology lead to human and technological adaptation in the speculative fiction novels under study?

3. In what ways are the earlier and later novels of each author under study similar or different from each other in terms of themes?

Conclusions

Findings in Relation to the Literature

Themes that emerged in answer to the research questions corresponded closely with premises appearing in the literature and other related research. This correlation of findings to research added depth to the interpretation of the themes that emerged in the study.

Technology and Change

Research Question One explored whether technology's role was indicative of or a causal mechanism of change in the future societies of the four novels analyzed in this study. In the Background and Need section of this study, views of noted futurists and

other writers on society and technology were reported in relation to the positive and

negative effects of technology on individual and community interaction. Addressing the

positive side of technological contributions, both Negroponte (1995) and Rheingold

(2002) assert that the emergence of electronic communities and interactive networks in

cyberspace will change the traditional meanings of community, place, and time. One of

the recurrent themes emerging from an analysis of the four future societies was a broader

definition of place and community as a result of emergent technology. Christakis and

Fowler (2009) assert that advances in information and communication technologies will

enhance connections between individuals and communities, allowing for the sustaining of

collective goals. Kamenetz (2010) further notes that technology that facilitates online

social connections is a pathway to self-expression for humans. Themes emerging from an

analysis of the novels suggest similar positive outcomes of the application of technology,

enabling individuals to create alternate virtual environments and personas, and providing

communities with ever-widening opportunities to connect with other like-minded

communities.

The literature also expresses contrasting views on technology as a negative social

force, also mirroring themes emerging from the analyses of the novels. These themes

include the power of technology to create fearful, over-controlled future dystopias (Brin,

1998), and the creation of AI with the power of re-ordering human values in ways

detrimental to human society (Dinello, 2005). Brin (1998) further asserts that surveillance

technologies and practices will be seen as burdens on trust and cooperation within

communities and between communities and governing bodies. This observation is echoed

in the novels; a recurrent theme is the distrust of technology-empowered government and

corporate surveillance and control, and a pervasive questioning of the stewardship of society by those in power. Finally, Dinello (2005) raises concerns about the development of AI and its potential to take control of human affairs, leading to revolutionary change and unknown consequences. In the novels under study, the theme of technology and its unknowable consequences, particularly in development of AI, is a central message.

In a study on the depiction of the future in speculative fiction, …", Mitcham and Casey (1992) note that the literature presents technology's effects in three ways: (a) as a means to utopian, or perfect, societies; (b) as a downward slope leading to dysfunctional, dystopian societies; or (c) as a neutral force, creating eutopian, or good but not perfect, societies (Simmons, 1998). According to Mitcham and Casey's study, the majority of novels that focus on technology's impact on social structures and mores of communication portray eutopias. Kelley and Kessel (2007) note that in eutopian societies, technology is central to social development and is seen as a reality, rather than as something that is good or evil. In Mitcham and Casey's terms, in the four novels, real and virtual worlds are depicted differently.

To varying degrees, the real worlds in the novels are presented as dystopias, environmentally damaged and/or dominated by oppressive government and/or corporate interests. Virtual worlds—the Other Plane, the Walled City, and the Matrix—are depicted as eutopian environments. On the one hand, battles between the forces of good and evil are fought in virtual reality, which also contains dangers mirroring scenarios seen in the real world; on the other hand, virtual worlds show promise as places where individuals can forge communities and work together to further mutual goals, as in the Belief Circles described in Vinge's *Rainbows End* (2006). Thus, the virtual worlds in the novels show

aspects of both utopias, in terms of the freedoms they afford inhabitants, and dystopias, in light of the struggles for control that ensue in these worlds. The contrast between the depictions of real and virtual worlds parallel two contrasting themes that emerged from analyses of the novels: the dystopian theme of distrust of real-world government and corporate surveillance and control, and the utopian theme of freedom to self- or co-create alternate personas and realities in the virtual world.

Adaptation and Non-Adaptation to Technology Driven Change

Research Question Two explored the ways in which the interface between humans and technology led to human and technological adaptation in the novels analyzed. A comparison between the societies of the novels analyzed in the study and Goerner's adaptive Dynamic Web World provides contrasting pictures of the possible near-future evolution of society. Goerner (1999) projects the possible evolution of current society into a Dynamic Web World, in which adaptation to the dawning knowledge of the complex, inter-related, and interdependent nature of the universe had been achieved. Adaptation is exhibited in that the evolved Dynamic Web World society has become a learning entity, in which humans strive to find new and better ways to sustain themselves, and society has also become a collaborative enterprise in which humans cooperate to survive and flourish. The imagined future societies portrayed in the novels under study, in contrast, display both adaptation and non-adaptation to the complex universe in which they exist.

In the society of *True Names* (Vinge, 2001), there are two relational dynamics at play: the oppositional relationship that exists between government and participants in the virtual world of the Other Plane, and collaborative relationships between inhabitants

within the world of the Other Plane. Interaction in the real-world society of *True Names* does not, in the main, suggest that it has evolved in a collaborative mode, as evidenced in the emergent theme of society's distrust of the technology-empowered government and corporate world. In her theory of a dynamic web world, Goerner (1999) posits that as society evolves, humans will come to embrace the concept of "becoming members rather than masters [of the world] . . ." (p. 266). However, in the society of *True Names*, the opposite has evolved, with government perceiving itself as absolute master of the country's citizen-members. Within the virtual world of the Other Plane, however, as in a dynamic web world, collaboration is a foundational premise. As in a dynamic web world, in which humans "co-create their environment" (Goerner, 1999, p. 267), participants in the Other Plane, through new technologies, co-create a virtual world in which a language and mythos are collectively fashioned, and in which adaptation to the interdependence of all entities is in evidence.

In the society of *Rainbows End* (Vinge, 2006), similar to that of *True Names* (Vinge 2001), an oppositional relationship with authority exists. However, in *Rainbows End*, as in *True Names*, virtual communities exist that are reflective of the dynamic web world predicted by Goerner (1999). Belief Circles bring together individuals into communities of special interests, and these communities function harmoniously and effectively to further their goals.

In contrast to the societies depicted in Vinge's novels, societies in Gibson's *Neuromancer* (2000) and *All Tomorrow's Parties* (1999) show no evidence, whether in the real or virtual world, of being collaborative. In *Neuromancer*, large corporations dominate the power structure of society and achieve their profit-driven ends through

coercion rather than through collaboration for the collective good. In this future world, a world of individuals struggle for survival, the antithesis of a dynamic web world.

The San Francisco-Oakland Bay Bridge community of *All Tomorrow's Parties* (Gibson, 1999) would appear to represent the collaborative, interconnected web world that Goerner (1999) envisions, and it is indeed a community held together by a sense of pride and connectedness to the past. In terms of the collaborative universe that Goerner foresees emerging, it is a community without masters. However, it is, at the same time, a community of independent members, held together by a desire to preserve individual autonomy rather than being a collaborative, interdependent society.

Taken as a whole, Goerner's (1999) theory of near-future society emerging as a collaborative entity is not borne out in the real worlds of the future societies depicted. However, the communities and societies in the novels that have their foundations in *virtual* worlds offer individuals the opportunity of becoming members rather than masters of such collectively created worlds.

Goerner predicts the evolution of a dynamic web world as a learning universe "on a long ladder of learning with a new form of Integral Consciousness [sic] possibly at hand" (1999, p. 267). Members of the near-future societies under study have in some cases adapted to their environments, and particularly their technological environments, in ways that reflect learning, as evidenced by the themes that emerged in the study's findings around power, disenfranchisement, and adaptation. Although far from the optimal learning universe of the future envisioned by Goerner, the society in *True Names* (Vinge, 2001) exhibits learning in the beginnings of a balancing of power between government and citizens. Further, although in a long-time adversarial relationship with

government, Other Plane inhabitants learn that a harmonious society does not flourish under a single, all-encompassing source of power, whether theirs or the government's. The Other Plane could be viewed as a new order of society, one much like the learning entity that Goerner (1999) projects in her dynamic web world theory. In *Rainbows End* (Vinge, 2006), learning of the kind proposed by Goerner, in which humanity is progressing along a long ladder of understanding, is exhibited in the emergence of a new perception of the value of generational interaction and interdependence. Societal disrespect for the technologically-illiterate is rooted in the culture, and was strongest in the dynamic between the young and the old. At issue for youth was both a disrespect of the limitations of the old in the use of new technologies, and the perception of their elders' inflexibility of thought. Through the course of the novel, however, young and old appeared to grow in knowledge and appreciation of each other and presented a picture of a society in the process of learning to adapt and integrate the gifts of all its members.

In contrast to *True Names* (Vinge, 2001) and *Rainbows End* (Vinge, 2006), Gibson's *Neuromancer* (1999) presented the picture of a society not functioning as a learning entity, illustrated in the theme that emerged in relation to the re-definition of the meaning of place and community. The physical environment in the novel had become dystopian; the lesson of the long-term effects of abuse of the environment had not been heeded. The virtual world of the Matrix offered information and entertainment to society, but not, as observed in the other novels under study, a place where an integral consciousness of community had evolved, as predicted by Goerner (1999).

The San Francisco-Bay Bridge community of *All Tomorrow's Parties* (Gibson, 1999) although not operating as a collaborative society of interconnected members, did

exhibit learning. The community, comprised of the previously homeless and marginalized, represented the antithesis of mainstream society; it existed in isolation as an autonomous zone, free from government policing. The community demonstrated learning through its resistance to dependence upon technology, government surveillance and commodification by corporations. An integrated consciousness existed, created by the tacit valuation of the independence of its community's members. The Bridge community demonstrated learning in its ability to heed the lessons of the dysfunctional mainstream society and create an environment in synchrony with its values, one of the hallmarks of Goerner's (1999) Dynamic Web World.

Themes From the Earlier to Later Novels of the Authors

Research Question Three involved a comparison of the earlier to later novels of each author in terms of similarities and differences. Vinge's earlier novel, *True Names*, first published in 1981, and his later novel, *Rainbows End*, published in 2006, reveal both differences and similarities in how near-future societies are depicted. One difference between the novels involves a shift in the perception of the enemies of society from the central government in *True Names* (2001) to greed-driven corporations in *Rainbows End* (2006). The most striking difference occurs in the modes in which each society interfaces with virtual environments. In Vinge's earlier novel, participation in the virtual world requires a total withdrawal from the real world. In Vinge's later novel, virtual reality is integrated into real-world life via the wearing of technology-enhanced clothing and contact lenses enabling the superimposition of virtual reality upon physical reality. Users are able to interact in the real world rather than required to withdraw from it. The difference in technologies used to access the internet presented in Vinge's earlier and

later novels may arise from the fact that Vinge, a scientist, chooses to place as much emphasis on the technology that delivers social change as on the change itself.

Gibson's earlier novel, *Neuromancer*, first published in 1984, and his later novel, *All Tomorrow's Parties,* published in 1999, primarily display similarities in their thematic narratives. In both novels, the earth's environment has been damaged by an evident lack of corporate oversight on the part of government, as well as by over-population and natural disasters. Both of Gibson's novels portray societies in which vibrant virtual worlds provide alternate living environments for humans: the Matrix in *Neuromancer* and the Walled City in *All Tomorrow's Parties*.

Similar themes emerge between and across both of the authors' works. One such theme is the endurance and importance of traditional real-world relationships between family, friends, and lovers, unchanged by future technological capabilities. A plausible interpretation of this recurring theme in the authors' works might be that, in the 20 years of high-speed technological development between the authors' earlier and later novels, the social and emotional needs of humans, if not the forms through which those needs are met, have remained constant. The authors may have seen no evidence from which to extrapolate near-future change in such basic human values as family, friendship, and love.

AI is also a focal point of both authors' earlier and later novels; Vinge and Gibson explore the possibility of sentient AI programs developing, independent of human control, with unpredictable consequences for humanity. Although self-aware and independently functioning AI is not a reality in the early 21st century, both Gibson and Vinge appear to envision its arrival on the near horizon.

Implications

From this study of future technology and its influence upon the evolution of social interaction, as depicted in Vinge's *True Names* (2001) and *Rainbows End* (2006), and Gibson's *Neuromancer* (2000) and *All Tomorrow's Parties* (1999), implications arise in the areas of (a) potentials for individual and group communication, (b) future work possibilities, (c) terrorism and warfare of the future, (d) education, and (e) human values.

Implications for the Development of Communication

One implication of this study relates to the exciting potentials, made possible by technology, of future communication. The technologies used to augment reality and to project, to any location, holographic self-images, seen in Vinge's *Rainbows End* (2006), and that enable full sensory immersion in a creative virtual world, seen in Vinge's *True Names* (2001), Gibson's *Neuromancer* (2001) and *All Tomorrow's Parties* (1999), if developed fully, would greatly expand the connections between individuals and communities in ways that do not involve the barrier of a computer screen interface. Currently, access to virtual worlds or social networks involves the distance the computer screen puts between user and experience; a sense of true connection, of being there, is not possible. With the development of technology such as that proposed in the novels under study, global communication could come to feel truly local, bringing humans closer to the perception of existing in a world-wide web of interconnectedness and dynamic collaboration, rather than simply increasing the supply of information to society.

Rainbows End (Vinge, 2006), which of the novels studied presents the most detailed picture of the development of near-future technologies, depicts the prospect of wearable computer systems and augmented reality via computer-enhanced contact lenses;

this technology is currently in an incipient state of development. This technology would represent a great expansion of communication potentials between private individuals, and national and international government and corporate leaders. Language differences could be mitigated or erased as data flows through contact lenses into the vision of wearers; as Vinge describes it, "the air around them filled with translation guesstimates and picture substitutions. . ." (p. 235). The pictorial representation of words would allow even illiterate individuals to communicate, on both a global and international level.

Implications for Future Work

With the potential of visual and varied forms of translation available to individuals, a collaborative area of research and careers could emerge, in which linguists, anthropologists, educators, and computer scientists could collaborate on language meaning and forms, and on the varied cultural representations of a visual form of communication. Technology, in this aspect, would further the concept of inter-disciplinary, creative work.

A Darker Side of Technological Development: Terrorism, Warfare, and Distrust

As outlined in the literature review of this study and in the novels themselves, technological development can manifest aspects that threaten social stability and global peace. In *Rainbows End* (2006), Vinge foresees the arrival of mind control through semantic viruses delivered via personal computers. Governments move a step beyond the current and ubiquitous surveillance of personal data described by Brin (1999) and begin to use computer data and networks to incapacitate or topple the governments of perceived enemies, bringing about public panic, economic chaos, and war. Further, in the novels under study, the rift between government, corporations, and citizens is wide.

Governmental and corporate use of technology for surveillance and control of citizens'

activities provokes rebellion in the form of subversion of effective governance and

commerce. As a result, the societies depicted lose stability and the firm control over their

destinies.

The responsibility of government and corporations to become "members instead

of masters of society" (Goerner, 1999, p. 266) the redressing of current world conflicts

and environmental damage, problems which call into question the sustainability of

civilization itself. Citizens and the organizations that lead them must agree upon where

the line will be drawn between technology used for consensual governance and

technology used for authoritarian control, and they must enact policies that enforce these

agreements. An alternative to the idealist vision of collaborative problem solving between

citizens and government is Brin's (1999) suggestion of making surveillance equally

available to both public and private individuals and sectors of society, rendering secrecy

both impossible and meaningless.

Implications for Education

The interconnectedness of individuals and communities through technological

development only becomes possible when technology and education in its use is

accessible to all. In the future societies examined in the study, the gap between the

technologically literate and illiterate has grown. This may imply that technological

advancement and education in its use will either promote individual and community

interaction and understanding or drive a wedge between people. If the gap between the

technology haves and have-nots widens, it will become yet another of the many divisions

that separate humans, taking humanity ever farther from an educated, informed populace,

and from the vision of a dynamic web world operating in synchrony for the benefit of all of its members (Goerner, 1999).

Specific Implications for Future Educational Practice

Although the traditional social inequities of poverty and privilege may mean that there will always be those who are left behind in the race to keep up with technological innovation and its requisite skills, this group should be provided with equal access to technology, exemplified in the $1.00 laptop initiative, with its goal of distributing laptops worldwide, and in the universal cell phone access program of re-distributing used cell phones globally. In addition to access and the opportunity to learn how to use computer-based technology, individuals can be taught that, beyond technical skills, there are other skills that are just as valuable and uniquely theirs. In *Rainbows End* (Vinge, 2006), Ms. Chumlig, a vocational-track teacher at the local high school, imparts essential wisdom to her class when she tells them

> Some of you think your hand in life is all deuces and treys . . . But I have a theory of life and it is straight out of gaming. There is always an angle. You, each of you, have some special wild cards. Play with them. Find out what makes you different and better. Because it is there, if only you can find it. And once you do, you'll be able to contribute answers to others and others will be able to contribute back to you. In short, synthetic serendipity doesn't just happen. By golly, you must create it. (Vinge, 2006, p. 60)

And as another character in *Rainbows End* says, "Our world is overflowing with technical expertise. Knowledge is piled metaphorical light years deep. Given that, the truly golden skill is the one that I possess—to bring together the knowledge and abilities that make solutions" (Vinge, 2006, p. 188). To evade the addition of yet another social distinction between human beings—that of the technologically literate versus the

illiterate—it is important that educators expand their view of what comprises skill in a technologically-enabled world.

Looking Backwards for Protection

Perhaps counter-intuitively, an important step in educating students in the use of the technology upon which we depend may be training in survival without technology. In the novels examined in this study, no mention is made of alternative energy development or of a lessening of dependence on the oil that enables the use and development of technology. For this reason, students should be taught the ways in which things worked in times of low technology—among them methods of communication, of healing, of creating energy, of manufacturing, and of transport and building.

Further, training in the low-technology functioning of the past can provide students with an understanding of their connection to the past, and their place in the evolution of the future.

Encouraging Reflective and Conscious Learning and Living

The development and growth of new technologies in the societies examined has taken unpredictable directions, producing uncertain consequences for humanity. In current society the same phenomenon can be observed; technological innovation is expanding exponentially, as futurist Kurzweil (2006) argues, while social and ethical impacts are under-emphasized. The development of technological innovation will reside in the hands of students of all disciplines, and those who teach and advise them. It is essential, therefore, that they be guided in two directions; first, in the power to imagine new and wonderful worlds of possibility for humanity, and second, in the development of a social consciousness that impels them to look ahead to the consequences of their

imaginings. One avenue to this end is the study of literature, and particularly speculative fiction, in combination with, rather separate from, science and the technology it creates. In the Review of Literature of this study, the schism between the two cultures of humanities and science was discussed; Snow (1959) appeals for a bridge to be built between the two cultures, noting that "the clashing point of two subjects, two disciplines, two cultures—of two galaxies so far as that goes—ought to produce creative chances" (p. 17). Literature is an avenue through which to look at humanity in its fullness; speculative fiction, with its foundations in the exploration of science and technology's impact on society, is a particularly apt venue through which students may be inspired by the imaginative "what ifs" of technology, while also analyzing and contemplating its effects on humanity.

Recommendations for Further Research

This study examined the effects of technological innovation on future interpersonal and community interaction. The themes that emerged from the analysis of the selected works of speculative fiction focused on aspects of virtual reality; the findings indicted changes in human's concepts of place, community and the presentation of self. Changes in currently held concepts may also occur through advances in bio-technology. The creation of cybernetic organisms—beings with both biological and artificial components—and the implantation of computer chips in human bodies will call into question the definition of what it means to be human. A thematic analysis, parallel to that carried out in this study, into potential changes in concepts and definitions of the nature of humans could be undertaken, drawing from the body of speculative fiction literature devoted to the topic of future bio-technology and cybernetic organisms.

Many additional aspects of future society as it is influenced by new technologies could be studied in depth, employing, as in this study, the methodology of thematic analysis to selected speculative fiction novels. Some of the many avenues of research that could be explored include the social evolution of work, education, leadership, global collaboration, social values, and spirituality. Specific to organizations, the study of the structures and values that govern organizational entities of the future could also have important implications for current organizational leadership practices. Interesting concepts upon which to base a speculative fiction-based thematic analysis include Burke's (2010) exploration of the structure of loosely coupled and tightly coupled organizations, most simply defined as hierarchical versus interdependent, and Stackman, Pinder and Connor's (2000) examination of the definition of organizational values, their importance, and value stability and change.

A further recommendation for future research is the undertaking of an investigation into whether and/or how speculative fiction is being used in the education of young scientists, particularly as a vehicle to encourage the consideration of the long-term consequences of technological innovation.

<div align="center">Concluding Thoughts</div>

The most important implication of the study is the need for a networked world in which long term thinking becomes a central characteristic. Given the impact that advanced technological innovation can have on social and environmental conditions, the ability to think beyond not just the next generation but the next several generations is essential; for humans, as they innovate, to foresee "not only the automobile but the traffic jam" (Steinmuller, 2003). In the novels studied, societies have created technologies

damaging both to the physical environment and to the trust between individuals and communities. AI has come into being, and has slipped from the control of its human creators.

The growth and power of technology has given humans a sense of control over the human condition; the sense that, even though life can be unpredictable, consequences will always be manageable, and that as long as technology advances there will be solutions to the problems that humans have created for themselves. Yet in the end it is not technology that will solve the fundamental problems of human survival, but an education in the consciousness of the complex interdependency of all life:

> Conscious beings should eventually evolve to the place where they begin to actively shape the world, not for selfish personal ends, but wisely, responsibly, ad for the good of the whole . . . Fully conscious beings become stewards of the world because they know that they are part of something larger. (Goerner, 1999, p. 234)

Such a consciousness would compel humans to think and plan in their long-term interests. Goerner (1999) states a basic tenet of complexity science in noting that "immeasurably small differences will keep evolution forever beyond our control" (p. 267). Yet while evolution is beyond human control, the ability to discern consequences is well within human capacity and responsibility. The implication is not that technological advancement be slowed or halted, but rather that truly creative thinking about its potential impact on the evolution of society should be uppermost in the minds of those responsible for its creation.

In all of the novels under study, the development of AI presaging the rise of a posthuman generation of beings is presented as inevitable, given advances in computer programming and computer processing power. Before this eventuality comes to pass, it

would be wise for humans, and particularly the scientist-creators of AI, to reflect upon what it means to be human. The place of humans in an era of posthumans is impossible to imagine, yet a discussion of what constitutes essential human needs, values and dreams is in order. Even as humans create self-aware AI entities that may move beyond their power to control, it will be possible to pass on to them an understanding of the human race they may come to dominate and of what qualities humanity wishes to preserve of itself.

One of the characters in *Rainbows End* (Vinge, 2006) states that "we live in a time that thinks it can ignore the human condition" (p. 145). In fact, the greatest power of humanity is its condition; themes in the study highlighted human creativity, adaptability, and the enduring strength of real-world loyalty, friendship, and love. Humanity would do well to add to its strengths an adherence to long-term thinking about the consequences of its actions. Technological innovation will, without doubt, escalate at speeds that not only make the future look dramatically different from the present, but which make the *present* look different from the *present* (Hollinger, 2006). Planning to the extent possible for the far-future effects of innovation can be humanity's gift to the sustainability of its societies.

This study began with a quote (Hillis, 2001) in which it is predicted that, whatever humans become in the future, they will be more connected and interdependent. The study ends with a corollary quote (Hillis, 1995) that tells a story of the way in which humans of the past held themselves accountable for the consequences of their creations:

> I think of the oak beams in the ceiling of College Hall at New College, Oxford. Last century, when the beams needed replacing, carpenters used oak trees that had been planted in 1386 when the dining hall was first built. The 14th-century builder had planted the trees in anticipation of the time, hundreds of years in the future, when the beams would need replacing. Did the carpenters [of the last century] plant new trees to replace the beams again a few hundred years from now? (p. 48)

Whether or not humans of the future will want to interconnect with the foundations of their past may depend on the forethought of the present generation in planning how foundational concepts will be passed on to them.

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APPENDIXES

Table 1

Main Characters, Roles, Settings, and Terms: Vinge's True Names

Character	Role
Roger Pollack, a.k.a. Mr. Slippery	The protagonist of the novel. A well-known video novelist, an expert infiltrator of computer security and data systems, and a founder of the virtual world called the Other Plane. A member of an Other Plane anti-government group who is coerced by the government to inform on Other Plane activities. Instrumental in the defeat of the AI entity, the Mailman.
The Mailman	An AI program created by government scientists as a self-directing, self-aware security system. Thought to have been terminated, it was mistakenly left running in the computer networks and is attempting to gain control of the system.
Erythrina, a.k.a. Debby Charteris	A founder of the Other Plane and a founding member of the coven Roger belongs to. A partner of Roger in defeating the Mailman AI. In real-life named Debby Charteris, a former government computer program designer involved in the creation of the interactive EEG Portal system (see Terms below) of the Other Plane.
The coven	The first of the anti-government groups, called covens, formed in the Other Plane. Roger and Erythrina are founding members

Settings	Description
Northern California, USA	Home of the protagonist, Roger
The Other Plane	A virtual world; created through computer software designed by Roger, Erythrina, and other computer adepts in their coven; visualized using the imagery and terminology of magic.

Terms	Definition
EEG input/output Portal	A technological device enabling entry into the virtual world of the Other Plane; consists of electrodes attached to the scalp which directly connect the brain to computerized data sources, providing for full sensory immersion in the virtual world.
Warlocks	Other Plane coven members with superior skills in the circumvention of computer security systems and manipulation of computer data.

Table 2

Summary of Main Characters, Roles, Settings, and Terms: Vinge's Rainbows End

Character	Role
Robert Gu	The protagonist of the novel. A famous 20th century poet who, after many years with Alzheimer's disease, is cured through bio-medical technology and re-enters a much changed 21st century society. Becomes a central figure in the fight against the development of a dangerous computer mind-control virus.
Mr. Rabbit, a.k.a. the Mysterious Stranger	Introduced as a corporate spy, appearing only in the virtual persona of a rabbit; later revealed to be a potential AI entity, part of a failed government AI program that has survived and developed. Unbeknownst to the human characters, he is behind the events they are involved in, and directing the action.
Alfred Vaz	Head of India's External Intelligence Agency; apparently working with global intelligence agencies on preventing the development of a computer-delivered mind control virus, while actually seeking control of the virus to gain influence over world events.
Miri Gu	Robert's pre-teenage granddaughter and expert in new computer technologies. She watches over her grandfather, and ultimately helps him destroy the mind-control virus.
Juan Orozco	High school student in the vocational track, taking classes with Robert Gu; develops a mutually beneficial learning relationship with Robert.
Mrs. Chumlig	An inspirational teacher in the vocational track at the high school that Robert attends; has shadowy links to Mr. Rabbit.

Settings	Description
San Diego, CA	Protagonist Robert's home; where the action of the story takes place.
University of California at San Diego (UCSD)	Home of the Librareome Project and the bio-medical lab where Vaz is developing a mind-control virus.
Rainbows End	A retirement community in San Diego where Robert's former wife lives.

Terms	Definition
Wearing	Referring to wearable technology. A method of access to computer data and social networks through clothing embedded with computing and digital components; access and navigation of the data is by body movements or voice commands. Also refers to the wearing of smart (technology-embedded) contact lenses which augment physical reality.
Epiphany	A virtual browser used to access computer data.
Foolscap	A large sheet of paper-like material, functioning like a laptop; used by individuals unskilled in wearing.
Librareome Project	A corporate profit venture targeting academic libraries; books are shredded and then re-constituted via advanced photographic technology.

Table 3

Main Characters, Roles, Settings, and Terms: Gibson's Neuromancer

Character	Role
Henry Dorsett Case, called Case	The protagonist of the novel. An expert at breaking into high-security corporate data systems, he is ostensibly hired as a data-thief by a powerful corporation. He later discovers that his actions have been directed by an AI, Wintermute, seeking to unite with its AI counterpart, Neuromancer. His skill ultimately accomplishes the joining of the two AIs.
Wintermute and Neuromancer	AI programs created by a powerful corporate family two hundred years before the story's beginning. They are created separately as a result of international laws limiting the intelligence level of super-computers. Wintermute, programmed as the active, decision-making component of the program, manipulates the human characters of the novel to accomplish its unification with Neuromancer, the AIs personality counterpart.
Molly Millions	Bodyguard and partner of Case; she acts in the real world while Case operates in the Matrix to achieve the unification of Wintermute and Neuromancer.
Tessier-Ashpool Family and Corporation	A cryogenically-preserved 200-year-old corporate family; leadership of the corporation rotates between family members currently out of cryonic sleep. Marie-France Tessier, matriarch of the family, created the twin AIs.
Lady 3Jane Tessier-Ashpool	The current head of the Tessier-Ashpool Corporation; one of the 20 clones of the Tessier-Ashpool children.
Linda Lee	Case's deceased girlfriend who remains a powerful symbol of human connection to Case. Both Wintermute and Neuromancer attempt to use the image of Linda to manipulate Case.
Armitage, a.k.a. Colonel Willis Corto	Works for the Tessier-Ashpool Corporation, but is in actuality controlled by Wintermute; through him Wintermute directs the actions of Case.

Settings	Description
Boston-Atlanta Metropolitan Axis (BAMA)	Case's home; also called the Sprawl. One metropolis comprised of the area from Boston to Atlanta; overpopulated and severely environmentally damaged.
Ninsei district of Chiba City, Japan	Also called Night City; an area unregulated by authorities, where experimental technologies are developed and tested. Case moves there to seek repair of neurological damage.
Freeside Space Station	An off-earth city in which nature, devastated on earth, has been artificially recreated; a popular tourist destination of the wealthy; owned by the Tessier-Ashpool Corporation.
Cyberspace	The virtual location of the Matrix; the space where online activity and interaction occurs.
The Matrix	A virtual world in which individuals can experience full sensory immersion; data from the memory of world-wide computer systems is presented in graphic form. Billions of participants use the Matrix for information and entertainment. Case pursues the unification of Winterute and Neuromancer within the Matrix.

Terms	Definition
Dermatrodes	The apparatus through which the Matrix is accessed. It consists of a computer console connected to electrodes attached to the scalp; the device provides a direct connection between the brain and computer data.
Simstim/ Sensorium	A device that, when connected to a computer, allows access to the sensorium, or senses, of another individual fitted with a broadcasting device created to transmit sensory data. Case was able to see and experience what Molly experienced when connected to her sensorium through the simstim.
Cryonics	The low-temperature preservation of humans; the Tessier-Ashpool family attains longevity by preserving successive generations and rotating their periods of life in the physical world.

Table 4

Main Characters, Roles, Settings, and Terms: Gibson's All Tomorrow's Parties

Character	Role
Colin Laney	Protagonist of the novel. An expert data analyst, with the ability to perceive times of great change, or nodal points (see *Terms* below), in emerging patterns of computer data. Previously working in the corporate world, he has gone into hiding in pursuit of discovery of the next nodal point. Laney leads the battle in cyberspace for influence over the events leading up to the nodal point.
Berry Rydell	A former police officer and security guard, hired by Laney to act for him in the physical world. He travels to the location of the coming nodal point at Laney's behest, becoming one of the characters most influential in bringing about the change that occurs.
Cody Harwood	The world's wealthiest man, head of a media conglomerate, and behind-the-scenes manipulator of the political and economic landscape. Sharing Laney's ability to perceive nodal points, he seeks to use the coming nodal point change to his benefit.
Konrad, a.k.a. the Swordsman	A swordsman of unparalleled skill with a Taoist philosophy, he is originally an assassin for Cody Harwood, but is moved to aid Laney and Rydell in the defeat of Harwood.
Chevette Washington	A former inhabitant of the Bridge community (see *Settings* below), who provides insight into the inception and values of the community. She is Rydell's girlfriend.
Rei Toei	An AI, designed as a virtual Japanese pop star, who gains self-awareness and eventually emerges into the real world as the first posthuman.
Boomzilla	A street child living in the Bridge community, representative of those who are socially and economically disenfranchised.

Settings	Description
Shinjuku Station under-ground, Japan	A homeless encampment comprised of cardboard boxes converted into living units; the home of Laney.
Ninsei district of Chiba City, Japan	Also called Night City; an area unregulated by authorities, where experimental technologies are developed and tested. Case moves there to seek repair of neurological damage.
San Francisco-Oakland Bay Bridge community	A northern-California community of the formerly homeless, who have taken over and built a community on the earthquake-damaged and unusable Bay Bridge. It is called an interstitial (see *Terms* below) community; an autonomous zone between police jurisdictions. Bridge community residents live with minimal technology and a belief in self-determination. The community has become a tourist attraction for mainstream society, and is the location of the nodal point foreseen by Laney.
The Walled City	A virtual city in cyberspace created by computer hackers in the image of the Chinese city of Sai Shing. Walled City residents work in opposition to corporate oppression, and join forces with Laney to defeat Harwood.

Terms	Definition
Nodal Point	A point in time when a world-changing event occurs; when something is decided that may not be readily discerned but is nonetheless the catalyst for fundamental change.
Interstitial community	A community functioning as a world within a world, metaphorically located in the gaps, or interstices, between mainstream communities. It is in these communities that great changes often start.
Nanofaxsimile machine, also called Nanofax machine	Machines using nanotechnology to digitally reproduce, at a distance, physical objects. Harwood, sensing that nanotechnology will play a significant role in the coming world change, plans to introduce Nanofax machines at the time of the nodal point.
Hackers	Computer adepts skilled in circumventing computer security systems; anti-authoritarian and resisting surveillance or control of cyberspace data.
Eyephones	Glasses connected to a cellular computer console, through which the user interfaces with the computer and enters cyberspace.

APPENDIX A

INITIAL THEMES: INDIVIDUAL NOVEL FORM

Author_____Title_____

Theme	Associated Technology	Evidence	Page

Page_____

APPENDIX B

NOTES ON PERTINENT TECHNOLOGY, TERMS, CHARACTER DESCRIPTORS,
SETTING, SUMMARY: INDIVIDUAL NOVEL FORM

Author:_____Title:_____

Pertinent Technology:
Terms:
Character Descriptors:
Setting:
Summary:

APPENDIX C

ALL THEMES RELATED TO RESEARCH QUESTIONS: INDIVIDUAL NOVEL FORM

Author_____Title:_____

1.   Theme_____

Page Reference Numbers:

Relevant Research Question/s:_____

2.   Theme_____

Page Reference Numbers:

Relevant Research Question/s:_____

3.   Theme_____

Page Reference Numbers:

Relevant Research Question/s:_____

4.   Theme_____

Page Reference Numbers:

Relevant Research Question/s:_____

5.   Theme_____

Page Reference Numbers:

Relevant Research Question/s:_____

6.   Theme_____

Page Reference Numbers:

Relevant Research Question/s:_____

APPENDIX D

RECURRENT THEMES: INDIVIDUAL NOVEL FORM

Author_____Title_____

THEME 1 Page Reference Numbers: Relevant Research Question/s:
THEME 2 Page Reference Numbers: Relevant Research Question/s:
THEME 3 Page Reference Numbers: Relevant Research Question/s:
THEME 4 Page Reference Numbers: Relevant Research Question/s:
THEME 5 Page Reference Numbers: Relevant Research Question/s:
THEME 6 Page Reference Numbers: Relevant Research Question/s:
THEME 7 Page Reference Numbers: Relevant Research Question/s:
THEME 8 Page Reference Numbers: Relevant Research Question/s:

Page_____

FINAL SELECTIONS OF THEMES: ALL NOVELS

FINAL SELECTION OF RECURRENT THEMES: ALL NOVELS
TN=*True Names*/RE=*Rainbows End*/N=*Neuromancer*/ATP=*All Tomorrow's Parties*
Theme topic: Related theme statements from individual novels: TN RE N ATP #1 FINAL THEME STATEMENT:
Theme topic: Related theme statements from individual novels: TN RE N ATP #2 FINAL THEME STATEMENT:
Theme topic: Related theme statements from individual novels: TN RE N ATP #3 FINAL THEME STATEMENT:
Theme topic: Related theme statements from individual novels: TN RE ATP #4 FINAL THEME STATEMENT:
Theme topic: Related theme statements from individual novels: TN RE N ATP #5 FINAL THEME STATEMENT:
Theme topic: Related theme statements from individual novels: TN RE N ATP #6 FINAL THEME STATEMENT:

APPENDIX F

December 16, 2009

Office of the Dean
University of San Francisco
School of Education
2130 Fulton Street
San Francisco, CA 94117-1071

Re: Dissertation IRBPHS – Lyn Motai

This memo is to state that the dissertation authored by Lyn Motai will not have human subjects as sources of data. All data will be collected from the text of fictional literature sources without the identification of any non-fictional human subject. Therefore there will not be an approval letter from the Institutional Review Board for the Protection of Human Subjects (IRBPHS) included in the application for advancement to candidacy.

Please contact me with any questions.

Regards,

Deborah Bloch, Ph.D.
Dissertation Chairperson