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FOLLOW THE LINK: CRITICAL NARRATIVES OF THE INTERNET

By

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ABSTRACT

FOLLOW THE LINK: CRITICAL NARRATIVES OF THE INTERNET

By

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This dissertation attempts to examine the Internet through the lenses of philosophy, sociology, psychology, and history in an effort to reconsider the impact of the Internet on life outside its wires. The overarching goal of this work is to effectively describe the Internet through the collection of practices that comprise it, and in the process, offer fresh perspectives to the meaning and significance of this socio-technical phenomenon. Key sites of analysis include knowledge, power, credibility, narrative, democracy, and semiotics.

The dissertation begins with a historical analysis of the Internet's development. As part of the analysis, I emphasize how representational media impact the relationship between humans and their knowledge, as evidenced in the differences in the organization of information between codex books and hypertext. This change in relationship is also reflected in the manner by which knowledge is made on the Internet, one that mirrors descriptions of power/knowledge advanced by Michel Foucault. A primary finding of the dissertation is that knowledge on the Internet is created through a circuit of exchange between those that produce, consume, and sort information on the Internet.

Also important to this work is the recognition that the Internet is much more than an information network. Specifically, it offers unique opportunities for the exploration and construction of the user's sense self. I identify three important narrative dimensions

of the Internet – *surfing, sharing,* and *submerging* – that form the basis of the storied nature of the Net.

The Internet also represents a unique opportunity to examine linguistic evolution and an exciting development for those interested in linguistics and literary theory. It presents an opportunity to think about the fundamental notions of literature and language – the author, the reader, the text, the construction of meaning – in an entirely novel way. Part of this dissertation is dedicated to exploring these possibilities by feeling out the boundaries of structural and post-structural understandings of linguistics and the Internet. Alternative understandings of hyperlinks and search engines that emphasize the connection between words and their meaning are offered as a result of the work in this dissertation.

Several chapters of this dissertation challenge past practices in Internet studies, including the method of assessment of e-democracy. I propose that when discussing democracy and the Internet, one should move the conversation away from singular notions of democracy and the Internet and embrace a more pluralistic understanding of both. Using John Dewey's sense of *becoming*, I offer a comprehensive continuum for the evaluation of democratic activity on the Internet, as well as a pluralistic understanding of the Internet. Finally, this dissertation also challenges how scholars of Internet studies construct the notion of credibility, arguing that framing Internet credibility decisions as a staged-process is valuable but limiting. In addition to credibility algorithms, I propose the value of intuition and perception for assessing information on the Internet

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THE BEGINNING

"What hath God wrought?"
Samuel Morse's first telegraph message (1844)

... knowledge is not made for understanding; it is made for cutting.
Michel. Foucault

Michel Foucault (1994b) begins his essay, "For an Ethic of Discomfort," with the following recollection:

> It was toward the end of the Age of Enlightenment, in 1784. A Berlin journal asked a few worthy thinkers the question, 'What is enlightenment?' Immanuel Kant answered, after Moses Mendelssohn. I find the question more noteworthy than the answers. Because enlightenment, at the end of the eighteenth century, was not news, was not an invention, a revolution, or a party. It was something familiar and diffuse, something that was going on – and fading out. The Prussian newspaper was basically asking: 'What is it that has happened to us? What is this event that is nothing else but what we have just said, thought, and done – nothing else but ourselves, nothing but that something which we have been and still are? (p. 443).

In many ways, the same could be said for a dissertation that asks the question, "What is the Internet, and what does it mean for humankind?" Like the enlightenment at the end of the eighteenth century, the Internet is no longer novel to many in the world. Rather, the Internet has received intense attention over the past ten years in news media, television programming, education, academics, and entertainment. For this reason, it may seem unusual to add yet another book to the long list of attempts to describe the Internet, its properties and core attributes. Though much has been written about the Internet, there is the feeling for those who make the Internet the primary platform of their work that the Internet is still very much misunderstood, undertheorized, and unknown. There is great difficulty in studying the Internet, primarily because it is undergoing such rapid change. The sweeping tide of new applications coupled with its ever increasing

user base raises a number of important questions. Of what Internet do we speak? Which applications, technologies, sites, or uses will serve as the bedrock for our understanding? How does one describe today's Internet without dating the description, making it irrelevant for tomorrow's Internet? How does one determine the relevant features for the Internet of tomorrow?

As is often the case with technology, visibility and stability do not often coincide. This problem is not new by any means, as William Galston illustrates through his example of the measuring the social impact of the television in the early 1950s. As a young medium, television was proliferating at an explosive rate, starting in obscurity in the 1940s to "near ubiquity only a decade later" (Galston, 2004, p. 59). It would have been reasonable for a scholar studying the social impact of television in the early 1950s to conclude that television was the latest activity to bring neighbors and friends together as they "crowded into a living room to watch the only set on the block." Yet, as studies by Putnam (2000) and Gitlin (2002) have demonstrated, television as a mature medium erodes at community rather than reinforcing it.

The potential for this same trap is found in the case of the Internet, perhaps to an even greater degree. Internet studies is far from a cohesive field, if it is a field at all, and as such, lacks a clearly distinguishable identity. In recounting his keynote speech to the 2003 Association of Internet Researchers Conference, Steve Jones describes (2005) that "there is not yet a canon; there are not departments and degrees...There are not yet methods specific to Internet studies. Perhaps most importantly, there is not yet a theoretical structure or exploration of Internet" (p. 233). I view this not as a problem, but an opportunity; however, Jones' observations also necessitate that in such an ill-defined

environment, it is important to define terms and explain the purpose for an extended installment of Internet study.

A Research Question

The primary research question for this dissertation is to answer the question: What is the Internet? Such a question seems fairly straightforward, an exercise measuring the writer's ability to describe the Internet by its technical dimensions – the hardware, infrastructure, and software that process, store, and transfer information between users and servers in a vast global network of data. Most would describe the Internet as the latest – and perhaps greatest – of new class of technologies that include the personal computer and telecommunication technologies. It is the "information superhighway," the greatest collection of information in human history. Such a description is accurate in summarizing a particular aspect of the Internet, but is this *really* what the Internet is? Is the Internet merely a collection of signals moving bits and bytes of data? By asking the question, I implicitly suggest that the Internet is far greater than the sum of its technical components. To say that the Internet is a data network would be similar to describing a human being as a collection of cells, organs, and biological systems. While technically true, it does not properly define the totality of what it means to be human. Likewise, to conceptualize the Internet through its technical components is to define it only by the material that comprises it. Art may be paint applied to a canvas, but that is not what art *is*. Many entities – social, cultural, and even technological – are far greater than the sum of their parts.

The primary research purpose of this dissertation is to effectively describe the Internet through the collection of practices that comprise it, an exercise that should extend the discussion beyond technical definitions or the resuscitation of a series of synonyms – information network, knowledge network, global village, virtual world, etc. In her ground-breaking book *Life on the Screen: Identity in the Age of the Internet*, Sherry Turkle (1995) examines how users of the Internet construct their identities through their online experiences. She describes some sensational examples in which users use their "life on the screen" to explore new, different, and multiple facets of their identity. Hers is a story told from the vantage point of the user; however, I seek to reverse the direction of analysis. Rather than exploring the virtual identities of real-life people, I hope to explore the real-world identity of a virtual entity, the Internet.

Defining the Internet as a Set of Practices

The Internet can mean a lot of different things to different people, depending on their attitudes, beliefs, values, technological practices, occupations, age, social circle, and so forth. As I have already argued, the most common view of the Internet is a technological one. For many, the Internet is the most fundamental technology in this "information age," a unique configuration of hardware, software, consumer electronics, and connectivity. It is a collection of components which work together to pass data around the world. A general survey of the definitions of the Internet reveals a general conceptual preference for the Internet as hardware and software. Some of the most commonly used words in these definitions include network(s), computer(s), worldwide, global, TCP, protocols, and system. So while it is important to understand the

engineering of the Internet (for values are often embedded in code), there is certainly more to this encompassing technology.

A more expanded definition of the Internet may include the relationship between users and the technology, satisfying Don Idhe's (1993) three qualifying characteristics of technology: concrete or material component, human use, and a relationship between the technology and humans. For some users, the Internet is a tool to manage their finances; others may leverage it as a political tool such as political candidates (Howard Dean, Barack Obama) and prolific pundits (blogger extraordinaire Glenn Reynolds); while still others may use it as a global dating service. This second understanding of the Internet is closer to the intended definition used in this dissertation, and yet, it still stops short of the comprehensive understanding I seek for the Internet. Yes, the Internet is a technology, one that forms a relationship with its users by virtue of their use. Yet, such a formulation separates a technology and its use. I believe such a separation to be arbitrary, and turn to Ferre's (1995) speculation about the boundaries of technology for guidance:

> But is 'it' a 'thing' at all? Is technology even a collection of many things, like tools and engines, utensils and machines, devices and artifacts? Or is 'it,' instead, more like science or religion or education, a combination of things with activities and beliefs and attitudes. (p. 14-15)

Drawing from Wittegenstein, Ferre (1995) seeks to free us all from the rational cage of the definition: "*Definitions are context-and-purpose dependent and should not be allowed to tyrannize their makers*" (p. 21, italics in original). We see from the examples above and Ferre's warning that definitions embody values. They not only give meaning, but they prescribe conceptual boundaries for ideas. For my research, the Internet is more than the wires, routers, and protocols that move bits of information, or a network of interlinking text, images, video, and audio. It is more than a tool leveraged by humans

for social, political, and economic motivations. Rather, the Internet is the virtual embodiment of the ideas, people, organizations, governments, and cultures it connects. The Internet is a set of social, cultural, economic, and political *practices*. These practices occur over the largest information network in human history, but wires, routers, servers, and hubs that embody the technical infrastructure of the Internet form the platform for such practices. The infrastructure is important, as we will see in several of the chapters, but to define the entire entity by its physical components is shortsighted and limiting. Paraphrasing Ferre, the Internet is more like institutions such as science, religion, and education. It is people and practices, information and ideology.

As a set of practices, the Internet this text examines is necessarily broad in its scope and allows for a wide range of questions to be asked of it. An inclusive understanding of the Internet aligns with the loose use of the term in current research, which may be used interchangeably with the World Wide Web, the Web, the Net, the information superhighway, and a number of other names. While there are technical nuances that separate these technological entities, the Internet of which I speak is inclusive of them all. In this dissertation, all online life composes varying facets of the Internet, though hypertext and hypermedia gather more attention than other activities online.

Basic Binaries: How Scholars Talk About Technology

While much has been written about the Internet (and information technology and media in general), scholars have struggled to reach consensus on even the most basic questions about it. Often this is because technology studies fall victim to the reductive traps of the binary distinctive. As Mehta and Darier (1998) describe, most Internet theory

cast the Internet into one of two dominant conceptions, "a neo-utopian, technological-determinist one and a dystopic, technocratic one" (p. 107). Carl Mitcham frames this division similarly, as a tension between two rival "fraternal twins" – a pro-technology, engineering perspective versus critical humanities approach (Johnson, 1998). Both descriptions use a black/white, left/right, good/bad distinction to organize the division of views about technology and media. Because there are more scholars who hold great suspicion for technology and promote the "problems" associated with its broad adoption, this review will begin by discussing some of the more important personalities found within the cynical side of the technology binary.

Alarmed by the centralization of mass media and what has been taken as the alienating effects of the technological condition, philosophers such as Herbert Marcuse, Martin Heidegger, Jacques Ellul, T. W. Adorno, Lewis Mumford, Max Horkheimer, Langdon Winner and many more critics have raised innumerable concerns over the legitimacy of the technology as a liberation project. Many of these philosophers view technology as in an implicit power relationship with their users, or more accurately *over their* users. We are cogs in a large machine, trapped by technology's deterministic effects. Emblematic of this position, Theodor Adorno and Max Horkheimer (1944) cast media and technology as "aesthetic activities" that bind us to "the rhythm of an iron system." In what has become a common argument in the sociology of technology, Adorno and Horkheimer see hegemony, control, and monolithic power in technology and media, a system that makes subjects of its users. Writing two decades later, Herbert Marcuse (1964) voices similar concerns as Adorno and Horkheimer. He argues that "in the medium of technology, culture, politics, and the economy merge into an omnipresent

system which swallows up or repulses all alternatives." As a Marxist, Marcuse saw the needs of the industrial capitalists merging with those of the entertainment industry simultaneously producing false needs within each consumer and eliminating independent thought and criticism. As such, Marcuse anticipates the "one-dimensional man," where personal interests are collapsed into a public, corporate agenda through the technologies of mass media. It is argued that technology has made it possible, more so than ever before, for capitalists to both create nations of consumers as well as eliminate the dissidence of the worker.

As a contemporary of Marcuse, Jacques Ellul took technology and reconceptualized it as "Technology," representative of the reification of technical products and systems into a style of thinking, a mode of thought, one that could subsume all other forms previous to it (Idhe, 1993). Ellul proved extremely influential in describing Technology as autonomous and deterministic. As Technology impacted all forms of social life, it became social in nature. Ellul (1964) rejects the man versus machine dichotomy, arguing that "when technique enters every area of life, including the human, it ceases to be external to man and becomes his very substance. It is no longer face to face with man but is integrated with him, and it progressively absorbs him" (p. 6). Thoroughly absorbed, *techniques* conform each person into "economic man", a citizen of the planned economy and society (p. 218). For Ellul, freedom is not a possibility in a technological society.

While the predominant perspective of sociologists, philosophers, and media critics is one of suspicion toward the deep penetration of technology into the human experience, there is a sizable coalition of scholars who see progress, potential, and

freedom in the same technological condition that causes great concern for so many others (Bolter, 2001; Drexler, 1987; McCorduck, 1985; Zuboff, 1988). Though some have seen the promise in television, movies, and video games (Gee, 2003; S. Johnson, 2005), most scholars reserve their techno-optimism for the Internet and the extended connectedness it brings to its users (Lessig, 2002; Poster, 1990; Rheingold, 2003; Trippi, 2004). For example, Peter Lurie (2003) argues that the Internet holds great political promise. Aside from the usual rhetoric about the Internet being a medium without gatekeepers, Lurie predicts that the activity of surfing itself will revolutionize politics in a way that other forms of media, namely television, movies, and print media, have been unable to do. As he says, "surfing mimics a postmodern, deconstructionist perspective by undermining the authority of texts. Anyone who has spent a lot of time online, particularly the very young, will find themselves thinking about content -- articles, texts, pictures -- in ways that would be familiar to any deconstructionist critic." For Lurie, surfing teaches Internet users to question the authority of the texts, even those held sacred (the Bible) and foundational (the U.S. Constitution). Through hyperlinks and the intertextuality of the Web, Internet users will recognize the cultural milieu in which ideas are born. This activity will cause many to question the authority of all texts, and in the process, Internet users will develop a postmodern disposition toward interpreting the Web. When authority has been deconstructed, tolerance is the default politic. As Lurie predicts, a Web user:

> ...will come to think, consciously or not, of everything he reads as linked, associative and contingent. He will be disinclined to accept the authority of any text, whether religious, political or artistic, since he has learned that there is no such thing as the last word, or indeed even a series of words that do not link, in some way, to some other text or game. For those who grow up reading online, reading will come to seem a game, one that endlessly plays out in unlimited

> directions. The web, in providing link after associative link, commentary upon every picture and paragraph, allows, indeed requires, users to engage in a postmodernist inquiry.

If Lurie is right, the Web may be raising an entire generation of politically astute critical citizens who reject authority for authority's sake. Notably, Lurie's perspective echoes Eisenstein's (2005) commentary about the influence of the abundance of print since Gutenberg's revolution on the critical reader: "More abundantly stocked bookshelves obviously increased opportunities to consult and compare different texts. Merely by making more scrambled data available, by increasing the output of Aristotelian, Alexandrian, and Arabic texts, printers encouraged efforts to unscramble these data...Contradictions became more visible, divergent traditions more difficult to reconcile" (p. 48). Like Lurie, Eisenstein also recognizes the relationship between abundance of information with divergent thinking. The primary difference between the two writers is the medium of interest (hypertext of Internet vs. codex of book).

Not surprisingly, Lurie is not a soloist in trumpeting the promise of the Web. George Landow (1997) concludes his book *Hypertext 2.0* with a cautious endorsement for the hypertext similar to Lurie's: "The strangeness, the newness, the difference of hypertext permits us, however transiently and however ineffectively, to decenter many of our culture's assumptions about reading, writing, authorship, and creativity" (p. 307). Like Lurie, Weinberger (2002) casts the Web as a technology that transforms bedrock concepts such as space, time, knowledge, matter, perfection, togetherness, and hope. John Seely Brown (2000) also recognizes the great potential in the Internet, positing this new medium as the rich fabric for complex, learning ecologies. What makes Brown's Internet unique is that it is truly a new medium – one that supports multiple intelligences,

is bi-directional (push-pull), and leverages the small efforts of many with the large efforts of a few (p. 12).

What unifies these perspectives is the appreciation each writer has for the Internet to transform and create a new world, a new experience. Like those pessimistic about technology's hegemonic potential, Internet optimists also see a technological condition rising from the bits and bytes, wires and webs of the Internet, but unlike their predecessors, they celebrate the change as a shift from modern to postmodern, industrial to postindustrial, from centralized to decentralized, from the death of the author to the birth of the reader. But does either of these positions fully describe the lived experience of the Internet? Is there a space in between technology as hegemony and technology as heaven?

This dissertation will take aim at the dichotomies often used to describe technology and specifically the Internet – problems vs. promises, essentialist vs. instrumentalist, revolutionary vs. restricting, democratic vs. hegemonic, etc. It is my hope that I can engage the Internet in a way that avoids the polarizing analysis of the past, much in the tradition of insightful philosophers of technology such as Nicholas Burbules, Don Ihde, Federick Ferre, and Andrew Feenberg. If we insist on describing technology in a way that requires an either/or distinction we paint ourselves into a corner, forcing a dichotomy which may be artificial and not reflective of the complexities of a sociotechnical context. In the pages of this dissertation, my goal is to unearth from the trite tales of the Internet fresh perspectives that illuminate the ways in which the Internet structurally and experientially reinforces the technological condition early philosophers

warned against, as well as resurrect the potential that lies within the greatest knowledge network in human history.

My hope is that a course of research considering the design and experience of the Internet will have clear ecological validity. The proliferation of the Internet as *the technology* for the "knowledge society" and its resulting social impact has important implications for society and education (Hargreaves, 2003). And although I desire to study that which impacts students, teachers, and administrators, pragmatism is not the sole reason for crafting this study. Candidly, this topic satisfies my own intellectual curiosity, a critical aspect to doing quality work. Even if it does not bear out in practical significance, I embrace my intellectual interests like those before me. As Jerome Bruner (1983) recollected of his own graduate school experience, "I felt starved for intellectual problems that grow out of curiosity rather than out of necessity" (p. 51). Fortunately, the Internet is undertheorized, so perhaps this study is born out of necessity.

Overview of Dissertation

What the following chapters offer is a critical narrative of the Internet, my way of answering the primary research question of this dissertation: What is our relationship with the Internet? Specifically, I will examine the real-life identity of the Internet as a collection of practices, and how the lived Internet affects the world outside its wires. Such an interrogation of Internet practice is organized into nine chapters:

- Chapter One: The Beginning
- Chapter Two: Technology's Drama: Where No Actor's Part Is Too Small
- Chapter Three: A Genealogy of Representational Media
- Chapter Four: The Discipline of Knowledge on the Net
- Chapter Five: Hypertext Semiotics
- Chapter Six: The Storied Nature of the Net
- Chapter Seven: Credibility at a Click: Information Evaluation in Open Networks

- Chapter Eight: The Democratic Value of the Internet
- Chapter Nine: Lessons from Links

Chapters two and three are meant to be read together, as they collectively explore the question of why we have an Internet. Chapter two begins by discussing the question of technological development, and in doing so, challenges traditional models which cast the forces of technological development as linear vectors. Rather than assuming cause-effect, sequential vectors of influence, chapter two suggests that technological development is best understood through the influence of a mesh of forces. Before discussing the configuration of influences that prompted an Internet, chapter two begins with the last revolution in informational representation – the printing press. Featured are an array of forces that contributed to the development of print media. Chapter three begins where the previous chapter left off – the enduring effects of the print revolution. The proliferation of print transformed the intellectual, political, and religious landscape of the West. Linked to print media is the rise of the industrial nation-state and modernity. The chapter concludes by outlining the development of the Internet as a factor of economic and political forces, noting similarities and differences with the development of print media.

Through chapters two and three, two key concepts are introduced. The first is *constructure*, which is a portmanteau combining "construct" and "structure." Constructure defines the relationship between form of representation and knowledge. It is seen as an important variable when considering transformations in informational representation, such as the print media and hypermedia. The second term is *ambiactivity*. Often in technology studies, commentators describe the interplay of forces within technological development as "interactional"– meaning relations *between* elements, or as

"transactional", meaning *across* elements. Chapters two and three introduce a new term which suggests a non-linear conceptualization of the network of forces involved – that of *ambiactional*, or relations encircling, encompassing, and environing elements. Instead of framing influence through vectors of force, *ambiactivity* implies forces acting through spheres of influence.

After exploring the development of representational technology in general, specifically print media and hypermedia, the remainder of the dissertation examines different ways in which the effects of a virtual entity are felt in the non-virtual world. In other words, chapters four through eight explore different dimensions of the Internet as a collection of practices. The first of these is found in chapter four, which untangles power relations on the Internet and reveals the inextricable relationship between power and knowledge. As is the case for much of this dissertation, the philosophy of Michel Foucault guides this chapter. In chapter four, I use several Foucaultian ideas to describe the production of knowledge on the Net. Foucault saw knowledge not as universal or fixed, but as arbitrary, situated, and culturally constructed. What counts as knowledge is created through a circuit of exchange. Foucault revealed that knowledge and power work together, as "the formation of knowledge and the increase of power regularly reinforce one another in a circular process" (Foucault, 1994a, p. 224). As such, knowledge and power cannot be separated as they work together to produce truth, making the notion of "value-free" information a contradiction in terms.

The power/knowledge/truth circuit aptly describes the interaction between the different elements of the Internet as an informational experience: Google, billions of web pages, and the Internet user. It explains how users, website designers, and popular search

engines interact in the field of power relations to transform bits and bytes of information into knowledge. Chapter four provides an extended discussion confirming Rieder's (2005) conclusion: "Power runs through the capillaries of this network and with reference to Foucault we have to understand power as a productive force, not as an inhibitor. Search engines are best understood as producers, not censors" (p. 29).

Chapter five emphasizes the linguistic importance of the Internet. The Internet is an exciting development for those that work in linguistics and literary theory, as it presents an opportunity to think about the fundamental notions of literature and language — the author, the reader, the text, the construction of meaning – in an entirely novel way. The marriage between literary theory and hypertext is one that is well formed, drawing extensive discussion from Nelson (1981), Landow (1992, 1997), and Bolter (2001), among others. This chapter then seeks to add to this strong tradition by describing some of the ways in which the Internet does shape language and language theory. Featured in this chapter is the work of Swiss linguistic Ferdinand de Saussure and influential twentieth century philosopher Ludwig Wittgenstein.

Chapter five discusses the ways in which the Internet offers a rich canvas to explore linguistics, particularly the ever-important concept of the signifier and the signified. The first and most important of these is the hyperlink, a form of representation on the Internet that connects (links) words or phrases with ideas meant to represent them. This chapter extends the traditional notion of the hyperlink as a connection between words to a connection between signifier and signified. Second, this chapter interrogates the function of the search engine in the arbitrary evolution of language. Search engines are more than a means of finding information in discursive environments; rather, they

connect words and phrases (in the form of queries) with constructed meaning (in the form of website hits). Lastly, we should consider the Web's unique geography and its consequences for the developments and interspersion of language. Linguistically, the Internet may represent the end of geography. Chapter five argues that within the Internet we find the validation for and limitation of a structural understanding of linguistics. Having tested the boundaries of structural linguistics, a brief discussion of the value of poststructural literary theory for a hypertext semiotics will be pursued. The chapter concludes by exploring Wittengenstein's notion of a "city of language" and "meaning just is use" to describe the interplay between Web and words.

Stories are a dominant force in human societies around the globe and throughout time. The sixth chapter of this dissertation consists of an examination of the types of experiences available to users on the Internet. I argue for the "storied nature" of the Internet, meaning that I believe the Internet to offer a different form of experience, one that is narrative in its organization. I describe the storied nature of the Internet through three dimensions: *surfing, sharing,* and *submerging*. As the root metaphor for the Internet, *surfing* consists of all general use of the Internet, and includes general web browsing and searching the Internet. The unique properties of the Internet amplify our narrative sensibilities, gifting us with a form of media that promotes agency for the individual. I describe how Internet users bring life elements to the Internet to construct new worlds and modify existing identities through the opportunities for recombination the Web provides. *Sharing* through the Internet includes Web-based activities in which Internet users leave personal records, prose, pictures, video, and ideas for others to find. Personal artifacts on the Internet embody the active construction of stories and self.

More often than not, sharing is conducted through Web-based social networking technologies such as *MySpace*, *Facebook*, *Friendster*, *YouTube*, and of course, blogs. The third and final category is that of *submerging*. Some Internet websites, applications, and environments offer immersive opportunities for users to (re)define self and rearrange, add, and delete the building blocks of their life narrative. A case study of the popular online world *Second Life* will illustrate the explicit nature of this form of narrative construction of reality. I will conclude the chapter by examining the combinatory effects of *surfing, sharing,* and *submerging* on the Internet as they relate to Nelson Goodman's ways of "world making."

Chapter seven addresses one of the more popular questions in Internet studies: how do we assess the credibility of information found online? This is the principle question of media literacy, whose advocates seek to equip students to effectively engage the dubious world of Internet information. Much if not most of the work that has been done in media literacy focuses on instructing students to use a script of key questions when surfing the Internet. A representative example may be found in Gardner, Benham, and Newell's (1999) discussion on teaching students how to evaluate the credibility from sources from the Internet. The authors offer five general categories by which the quality of a Web source should be evaluated: authorship, accuracy, objectivity, currency, and coverage. In this chapter, I characterize such efforts as part of the growing "checklist" approach to Internet credibility. There is, I believe, a utility for framing credibility studies as a staged process, depending on the purpose of the searcher and the kind of information they may encounter online. However, as I argue in this chapter, information

on the Internet is far too diverse and ill-structured to be adequately evaluated with the use of one Internet strategy.

What is needed are other evaluative tools for the Internet, those that are better suited when the information online is ambiguous in its authorship, "objectivity," and coverage. Using two seemingly unrelated schools of thought in Aristotle's description of *style* and Gestalt psychology's emphasis on human perception, I will describe the value of intuition as a way of knowing on the Web. Scholars such as Klein (1989) describe in their studies the value of intuition in natural-setting decision making. The Internet is a natural setting for its users, particularly the students that we teach. I make the argument that through processes like reification and closure, Internet surfers employ "gut and guess" strategies to evaluate the Internet. They rely on their perception of credibility, which is informed by their many experiences surfing the Internet. They learn alternative ways of assessing credibility that is dynamic and adaptive to the many genres, purposes, and informational practices found on the Internet. As such, I suggest that educators should acknowledge the value of perceptive credibility as they teach students strategies for being media literate.

One of the most common points of contention regarding the Internet is its democratic potential. Chapter eight takes up the question of the democratic attributes of the Internet by dividing the body of commentary on the politics of the Web into a two dimensional grid. In this grid, the horizontal axis ranges from optimism to pessimism and the vertical axis spans from essentialism to instrumentalism. As one would expect, those optimistic about the democratic value of the Internet emphasize its "essence" or "essential" nature as an open platform for idea exchange. Those pessimistic about the

Internet's value as an agent for democratic change often emphasize the "instrumental" nature of technology, meaning that the true character of a technology is realized through its use. Hence, the Internet is of minimal democratic value if it is dominated by reductive, commercial sites that do little for democratic exchange.

Reacting to the polarizing nature of much of the past commentary on democracy and the Internet, I provide an analysis of the Internet that encompasses many of the "sites" of democratic activity. In using David Held's (1995) seven "sites of power," I provide a detailed assessment of the current state of the Internet's role in promoting democracy. Such an evaluation will reveal the need for an understanding of the Internet that stresses its plurality – not one, but many Internets.

I conclude chapter eight by suggesting that the disagreements between the pessimistic-instrumentalists and the optimistic-essentialist can be explained by the existence of multiple Internets. The phrase "the Internet" improperly represents this broad collection of practices monolithically and singularly, when in effect there are many Internets (two of which are discussed in this chapter). The Internet common to our thinking is a large, open discursive network of information, a platform for connections between people, organizations, and ideas. It is the "Deep Web," the Internet of a "thousand plateaus," a collection of "small pieces loosely joined." Certainly, this Internet exists, but there is also the Internet *in effect*. This is the Internet that is realized in everyday surfing. It is the popular and visible parts of the Web, the commercial sites that dominate the search engine listings and garner the vast majority of user activity. This is the "Shallow Web." The difference between these two Internets is much like the difference between the known and unknown Universe, or at least the difference between

commercial television and public television. The Shallow Web mimics television's reductive presentation of the knowledge universe; whereas, the Deep Web leverages the rhizomatic structure of hypertext to create a medium that is worthy of labels such as revolutionary and evolutionary. The Deep Web is also the Internet that offers the most potential for democratic activity. Chapter eight draws on principles from Plato and Foucault to tease out the theoretical implications of multiple Internets.

To summarize the seven chapters of analysis found in this dissertation, each offers a provisional answer to a question related to the real world identity of Internet, a virtual entity. Such questions include:

> Chapters Two and Three: How does the Internet offer a different relationship with text than previous media forms?
> Chapter Four: What does the Internet, particularly the role of its search engines, mean for our relationship with knowledge and power?
> Chapter Five: How will linguistic evolution and language theory be influenced by the Internet, including fundamental notions of time and space?
> Chapter Six: How is the Internet influential in constructing the storied self and world making?
> Chapter Seven: What influence will the Internet have on longstanding conceptions of credibility, specifically Aristotle's *logos, ethos,* and *pathos*?
> Chapter Eight: What impact will the Internet have on democratic development?

The Word

While this dissertation is organized around seven chapters that feature distinctive concepts, there are some key themes that run throughout the seven chapters with varying degrees of visibility. Several of these concepts have already been discussed, including *constructure*, *ambiactivity*, the presence of binary distinctions in Internet studies, and the role of power on the Internet. These themes manifest themselves in different ways throughout the text, and provide some continuity to the collection of work presented here.

One other theme that is important to this critical narrative of the Internet is the role of language and "the word" as an act of representation.

Words hold a special place in intellectual history. Whether through speech or print, poetry or hypermedia, words are humanity's most robust mechanism of representing patterns of thought. It is through the word that we enhance our abilities of reflection, abstraction, and intellectual exploration. The importance of words has not gone unnoticed over the intellectual history of the West. Dating back since before Socrates, philosophers and religious leaders have held "the word" in high esteem, going as far as deifying the concept. Around the sixth century B.C., Heraclitus elevated the importance of the word with his use of the term *logos* (meaning word, speech, or thought) to represent a universal organizing principle for all life. From Heracalitus' viewpoint, "All things are in constant flux, and yet are fundamentally related and ordered through the universal Logos, which is also manifest in the human being's power of reason" (Tarnas, 1991, p. 45). Early Christians, influenced no doubt by the Hellenistic culture in which they lived, intentionally equated Jesus as the Word in human form. Introducing his gospel, John writes, "In the beginning was the Word, and the Word was with God, and the Word was God." In the original Greek text of this passage, John's words read, "In the beginning was the Logos, and the Logos was with God, and the Logos was God." Such an explicit connection would be hard to miss for cultural Greeks, but for the purposes of this dissertation, the gospel of John reaffirms a strong commitment to the importance of the word.

Tied to the word is the notion of *representation*. For Heracalitus, the Logos represented order, structure, and stability; for Christians, the Word is Christ himself, God

in man form. Even outside of religious contexts, the word is an important act of representation. Words represent human thought and expression. As a collection of words, language frees us from the boundaries of our immediate perceptual experience, and allows us to extend knowing to the unseen, the unexperienced, and the unknown. More than anything, language is a tool used to make sense of the world (Bruner, 1986, p. 72). Early in life, language filters into the child's subterranean mental processes, giving structure to experience. When children use language, they ascribe to a system presented by their culture in an effort to construct a coherent representation of the world. It is more than merely a means of communicating; rather, it is the means by which social interaction and higher psychological functions are internalized (Miller, 2002). As Bruner (1991) concisely stated, "The structure of language and the structure of thought eventually become inextricable" (p. 5). So if the word is the externalization of thought, how we represent the word is an activity of incredible importance.

Much of this dissertation is concerned with the epistemological effects of different transitions in representation of the word, particularly the most recent being from print media to hypermedia. What influence does hypermedia, a developing form of representation of the word, have on human thought? A goal of this dissertation is to provide a partial answer to that question. It is no wonder that scholars such as James O'Donnell identify this change as one of historic importance. "We live in a historical moment," writes James O'Donnell (1998), "when the media on which the word relies are changing their nature and extending their range to an extent not seen since the invention of movable type" (p. 9). O'Donnell's words, as well as Drucker (1994), Weinberger (2002), and others, captures the enormity of this moment in human history. For five-

hundred years, Gutenberg's insights shaped the economy of ideas, spreading information far and wide. Like the Gutenberg revolution, the Internet represents new relationships related to human thought. How the word is represented provides opportunities and constraints on human thought and the nature of knowledge. As chapters two and three will show, the standardization associated with print media offered a different informational taxonomy, one that was hierarchical and linear. A strong theme in the chapters that follow is how hypermedia affords a new informational taxonomy, one not easily reproduced in print media.

Levels of Analysis in this Dissertation

As I have already indicated, this dissertation considers those questions revolving around the Internet's nascent identity by drawing from multiple disciplines including philosophy, psychology, sociology, and history, among others. Such an interdisciplinary approach to technology research is advocated by scholars such as Robert Johnson (1998) who argue that infusing multiple disciplines into the pulse of our research is the best way to complicate technology, challenging its longstanding or unnoticed assumptions from a variety of perspectives.

Complementing this integrative approach are multiple levels of analysis and theory. As Elizabeth Heilman reveals in "Escaping the Bind Between Utopia and Dystopia," theories work at varying levels of analysis, namely *macro-theorizing*, *micro-theorizing,* and *meso-theorizing*. "Macro-theorizing concerns the operation of social institutions, entire cultural systems, and whole societies," explains Heilman (2005), "...while micro-theorizing deals with distinctive expressions of time, space, and people, and tends to avoid abstraction and generalization (p. 115-116)." Meso-theories tie the

macro and micro levels of analysis together. Heilman convincingly describes how these levels work in efforts of critical theorists, from the macro-perspective of the structuralists to the micro-practices of post-structuralist feminists.

This dissertation features varying levels of analysis and theorization. In the first few chapters, I provide a general overview of the historical forces at play in the development of the Internet and other representational media. My early writing focuses on the *broad* forces at work in the relationship between humans and their information, and as such, may be best described as *macro-level* theorization. Later, however, I move to *micro-level* theory as I discuss the nature of power on the Internet, and the relationship among individual actors of the Internet search (search engines, Internet surfers, information producers). During such discussions, "the immediate micro experiences of power, possibility, control and/or oppression in specific...settings and sets of individuals" are described. As I move in and between chapters, several "meso" themes emerge that tie together the early macro-work of the dissertation to the intermediate micro-analysis. The final chapters offer discussion of a "new criticality" for educators binds together some of this disparate work, as do the implications of the meso-concept of "constructure."

While theorizing at different levels and through different research traditions can provide a more interesting and complex set of conclusions, such a practice does complicate the final product and creates inconsistencies across the dissertation. Because I explore the internet at different levels, difficulty can arise as certain views, approaches, or frameworks sometimes conflict with one another as I discuss the structural implications of the Internet's essence, the hyperlink, and the post-structural nature of the

Web in the same dissertation. However each level and type of theory creating a willful theoretical bricolage of complementary elements as I explain chapter two. Such an approaches to theory and analysis is evident in my ranging use of the word "representation" for example.

Contradictory Uses of Representation

In the pages of this dissertation are many uses of the word *representation.* Sometimes, most notably in Chapter 3 ("A Genealogy of Representational Media"), I speak of "representation" within the context of Internet and media studies, implying a particular meaning and use of the term. Media are, by their nature, acts of representation. They provide a particular view of the world. By using the term "representational media," media scholars make that act of representation explicit (even though the term is somewhat redundant). Emphasizing the activity of representation is an important part of keeping the problems of representation in clear view. For example, being a critical viewer of television programming is to realize that TV programmers construct a particular reality, one designed to entice viewership and generate advertising revenue. Because the purpose of television programming is to sell commercial space, the actions of TV executives reflect those values and the world that is presented to us is necessarily artificial (Media critic Todd Gitlin (2002) emphasizes this point: "As CBS's vice president for television research once told me: 'I'm not interested in culture. I'm not interested in pro-social values. I have only one interest. That's whether people watch the program. That's my definition of good, that's my definition of bad (p. 204)"). As I outline the genealogy of representational media, I am examining the immediate and enduring effects of those media on what and how they represent. As such, I am using the

term in a particular context with a specific history to convey what I believe to be important elements of a critical approach to the Internet.

Other times, I speak of "representation" more generally, or at least outside the context of media studies and draw from the tradition of post-structural philosophers, most notably Derrida, who argue that there is an inevitable lack of fixity in the meaning of words, creating movement and play between sign and signifier. In "Structure, sign, and play in the discourse of human sciences," Derrida (1988) illustrated for his readers a fundamental flaw in structural conceptualization of meaning. In describing the "structurality of structure," Derrida argues that all structures organize themselves around a center, such as freedom, power, hegemony, or capital. These centers serve as an organizing principle for the structure, but as such, cannot be affected by the structures that surround them. In his own words, Derrida showed that "...it has always been thought that the center, which is by definition unique, constituted that very thing within a structure which while governing the structure, escapes stucturality" (p. 109). Centers were necessarily outside the influence of the structure; consequently, Derrida argued that the center of any structure most not be located in the center, but outside the structure. "The center is at the center of the totality, and yet, since the center does not belong to the totality (is not part of the totality), the totality *has its center elsewhere*" (p. 109, emphasis in original). This was Derrida's great "rupture" between structural and post-structural ways of thinking. He revealed that though structures necessitate the existence of centers though centers necessitate the deconstruction of the structure. No form of human discourse can be outside of discourse itself.

It is in this context that I sometimes employ the word "representation" in this dissertation, as an *act or activity* that restricts the possibility for fixed meaning and necessitates movement and play between sign and signifier. "Representation" in this context falls closer to what some might consider a post-structural understanding of the term. Such an implementation of "representation" differs from the use of the term in media studies, which is fixed, static, structural, and stable. This tension between a stable and unstable meaning of "representation" exists throughout most pages of the dissertation. I do not seek to rectify the sometimes contradictory ways I use the term, but rather I only seek to describe it and make the reader aware that I too feel this tension as I write even as I find a multiplicity of levels of analysis fruitful.

Critical Narratives

The full title of this work is "Follow the Link: Critical Narratives of the Internet." Titles can say a lot or a little, depending on how much you work at them. I chose the phrase "critical narrative" as it captures the two-sided nature of this work. By casting away assumptions and the familiar numbness we have of the Internet, this dissertation is "critical" (Fendler, 1999). However, "narrative" is indicative of what I believe to be the essential role of narrative as an epistemological template. Any effort to examine a socio-technical trend as large and sprawling as the Internet is to tell a particular story (or more accurately, a collection of stories). The stories contained in chapters two through eight are only some of many possible tales one could tell of the Internet. I find this stance to be in concert with Jones' (2005) observation: "There is much to the notion, I think, that the Internet shows us what we want it to be, and much to the obverse notion, that what we want the Internet to be shows through in our research and scholarship" (p. 235). So it is

with any telling of the Internet. As Nietzsche (1997) once argued, "This is my way; where is yours?... For *the* way --- it doth not exist!"

The collection of chapters presented in this dissertation address what I believe to be important consequences (and in some cases attributes) of the Internet. My goal with these chapters is to leave the reader with the understanding of the unique effects of this medium while avoiding the usual rhetoric for or railing against technology and media. The order of the chapters in this dissertation is not random, but represents "layers" of Internet practices. The early chapters introduce themes that influence discussion later on in the dissertation, though certainly not all chapters relate evenly to the others.

At its core (chapters two and three), this dissertation explores issues related to the constructural effects of the Internet. I argue that the Internet offers a different relationship with knowledge, a change that has broad implications for the social, political, and economic order. Expanding out from the core are power relations on the Web (chapter four), which run through every dimension of Internet practice. The next layer in this series involves the relationship between language and the Internet (chapter five). As I have expressed, language is a root practice and is of particular importance to Internet studies. These five chapters provide a basis for the sixth, which addresses issues of identity, as the Internet is becoming an important space for the construction of self and worlds. Next, I consider how users of the Internet perceive credibility online and how scholars construct credibility standards for the Internet (chapter seven). The credibility of the Internet should certainly influence to some degree the democratic value of the Internet (chapter eight). The final layer of this dissertation is a capstone chapter which

distills the lessons presented in the previous eight chapters and provides direction for future research.

With a thumbnail sketch of this dissertation in hand, I now turn to the first task of this project – a discussion about the development of representational media.

CHAPTER 2
TECHNOLOGY'S DRAMA – WHERE NO ACTOR'S PART IS TOO SMALL

> Indeed, those who seem to agree that the momentous changes were entailed always seem to stop short of telling us just what they were.
> *Elizabeth Eisenstein, Printing Revolution in Modern Europe* (2005)

The Internet is the largest single network in the history of humankind. For many of us, a "network" is a constellation of technical components – computers, browsers, servers, infrastructure, protocols, and the bits of information that flow over its wires. But the Internet is more than a hardware universe; rather, it can be best understood as loose collection of people, places, ideas, values, practices – a *sociotechnical* entity. Often scholars prefer to discuss the internal qualities of the Internet or its realized effects in the lives of those that use the Web, but few have examined the development of this technological organism. How did the Internet come to be?

Framing Technological Development

A common approach may be to examine the forces leading up to the birth of the Internet. Like water's affinity for the path of least resistance, such a story easily falls along the lines of a single, master narrative. "Tradition wisdom about the nature of technology has customarily stressed the importance of necessity and utility," writes George Basalla (1988). It is often convenient to reduce the development of technology to humanity's attempt to address a problem in its immediate reality; as the old adage goes, necessity is the mother of invention. Those technologies that best address humanity's immediate challenges are adopted and perhaps developed further. In this way, technology is a material form of progress, and its utility is the driving force for its widespread adoption. Some technologies do conform to this meritocratic conceptualization of technological development. In the late eighteenth century, Eli

Whitney invented the cotton gin to mechanize the time-consuming process of hand cleaning cotton. During World War II, the U.S. government established the highly secret and devastatingly effective Manhattan project to build an atomic bomb before Nazi Germany did (Diamond, 1999). Often, medical technologies are developed with a particular problem in mind, such the Jonas Salk's polio vaccine in 1957. So in some cases, technology is the direct offspring of mother necessity and her husband utility, causing some to equate technology with progress, but is technology always explained as a response to our immediate environment?

In truth, very few informed observers would subscribe to the naïve proposition that technological development is best explained as responses to necessity and utility. Such a linear account of technological development is clearly insufficient when held to the scrutiny of the real-world examples. Often, technologies are not a reaction to a market, a need, or a problem, but are better viewed as the product of extended tinkering by the inventor, creating a technology without immediate application. "Once an inventor has discovered a use for new technology, the next step is to persuade society to adapt to it," writes Jared Diamond (1999) in his best selling *Guns, Germs and Steel.* As evidence, Diamond offers the example of Thomas Edison, for whom it took over twenty-years to be convinced that his phonograph should be used commercially for playing music. Sometimes through failure, inventors find useful applications for their inventions. A 3M researcher named Spencer Silver was trying to make a strong adhesive, but actually produced incredibly weak glue. Years later Arthur Fry proposed that such glue be used to create 3M's now famous "Post-it Note" product. This is an example of the "Rudolf

effect," whose bright, red nose was a "technology" without application, until one foggy Christmas Eve.

Technology Development as Transactions

What unites both of these two approaches to technological development – technology as a reaction to problems and technology as a product of curiosity – is that neither account adequately considers the relationship between society and technology. Though human beings create technologies at times in response to their immediate reality and others out of curiosity, those technologies, if used, often shape and mold the very society that developed them. As such, some scholars complicate the theory of technological development suggesting that while humans shape technology as a means to overcome immediate problems, technologies also influence humans through their use, thus create a revolving current of influence. Thus, some envision the relationship between humans and their technologies as what Csikszentmihalyi and Rocherb-Halton (1981) have termed as "transactional." In *The Meaning of Things* these scholars argue that:

> It is quite obvious that interaction with objects alters the pattern of life; for instance, that refrigerators have revolutionized shopping and eating habits, that automobiles created suburbs and increased geographical mobility, or that television is changing how family members relate to one another. (p. 14)

For Csikszentmihalyi and Rocherb-Halton, objects are created in response to an immediate reality, but invariably shape any future reality. It would appear that objects are "modes of" and "modes for" reality. "In the first sense, they reflect what is," suggest the authors, "in the second, they foreshadow what could be..." (p. 27). Under such thinking, the automobile reflected 19th century America's need for a more robust transportation solution in the face of emerging industrialism. But the use of cars over time has affected

far more than just how we get to work, home, and to our social spots; rather, they changed where we work, live, and play. While the car reflected the need for more robust transportation, it also impacted society in many unanticipated ways. The same can be said for a variety of domestic technologies, including the washing machine, refrigerator, television, central heating, and so on.

While more sophisticated, the transactional theory of technological development still frames technological development and its subsequent adoption as a response to what is. This represents a sort of technological inevitability – that certain technologies surfaced independent of forces outside of a basic need. Transactional theory does not adequately account for the social, economic, and political forces at work in technological development. In response, a number of a growing number of historians and sociologists of technology have questioned deterministic, value-free theories of technology development. They argue that technological development can only be explained properly through the wide variety of forces at work in the process: economic, social, political, governmental, and technical.

In *How the Refrigerator Got Its Hum* (MacKenzie & Wajcman, 1985), a collection of scholars illustrate how a number of technologies were developed or adopted not out of necessity or utility, but to achieve a more arbitrary end. They include evidence detailing how a closed military culture threatened by external innovation created conditions that adversely affected the technical proficiency of military rifles used in the Vietnam War, how certain technologies, such as electric powered refrigerators became established consumer products over the competing gas-powered refrigerators because the economic clout of companies such as General Electric, and how other "domestic

technologies" like the portable vacuum cleaner assumed market dominance over the more efficient central vacuum cleaner because of the effective marketing techniques of door-to-door vacuum salesmen. These examples show that much more than market logic goes into the design and success of many technologies. This is particularly evident in the earlier example of motorized transportation. Basalla (1988) writes:

> National leaders, influential thinkers, and editorial writers were not calling for the replacement of the horse, nor were ordinary citizens anxiously hoping that some inventors would soon fill a serious societal and personal need for motor transportation. In fact, during the first decade of existence, 1895-1905, the automobile was a toy, a plaything for those who could afford to buy one. (p. 6-7)

For Basalla, the automobile cannot be viewed as a response to society's growing transportation problem, though it did transform transportation around the globe. Rather, he suggests that the "*invention* of vehicles powered by internal combustion engines gave birth to the *necessity* of motor transportation" (*emphasis in original,* p. 7). Often, this "necessity" was reinforced by even larger forces at work: corporate (influence of General Motors on zoning ordinances), governmental (passage of Federal Highway Aid Act of 1956), industrial (assembly line techniques), and affective (marketing techniques such as the annual model). The rich interplay of a meshed network of social forces on technological development is best seen in the adoption of bus as a solution to urban mass transit.

The Bus is Young and Honest

In his revealing account of the adoption of the bus in mass transit in New York, Schrag (2000) describes how technical superiority is not the only factor influencing the proliferation of a particular technology, and often it is not even the most important. As a case study, he uses the volatile politics of the New York City in the 1920s and 1930s to

illustrate how technologies of transportation were positioned as a proxy for political and economic forces. From the 1830s through the 1920s, the rail systems of New York operated in absence of competition. They were the first urban mass transit system and enjoyed enormous profits, so much so, that they bound themselves to particularly harsh contracts with the city in order to secure their right to operate. They paid heavy taxes on their *gross* profits, agreed to a rigid price controls (nickel fares), and consented to paving city streets. Despite such binding agreements, the rail system thrived for decades and enjoyed terrific profits until automobiles, subways, and inflation threatened the industry. More damaging, though, was the view of city hall officials (particularly the Mayor) that the rail systems were corrupt and price gougers. "Their monopolistic profits in the 1890s had stained transit companies as greedy, dangerous menaces," writes Schrag (p. 61). Public officials sought a means by which to undermine the operating authority of the privately owned rails, and in the bus, they found a viable, public alternative. The bus systems did not carry the stigma or history of the rail system, and in this way, they were viewed as "young and honest." In his detailed account, Schrag describes how Mayor Tylan and his Tammany Hall cronies engaged in a protracted battle with the rail companies over control of Manhattan surface transit. While Schrag's account of this conflict reveals a number of social, political, and economic forces at work, for our purposes, his conclusion is most important:

> In an ideal world, perhaps, transit companies could have chosen the vehicles best suited for their cities independently of considerations of fares, schedules, routes, taxes, and other conditions of operation. In real American cities, however, technical choice was inextricably bound up with decades of laws and customs that had grown up with the street railway. Such interplay between innovation and regulation occurs not only in transportation but in all industries deemed public utilities. (p. 77)

What Schrag reveals through the example of the bus is a network of forces at work in technological design, development, and adoption. This is fitting as this chapter is not so much concerned with the *technological invention* as it is with *technological development*. Too often historical accounts of technological development climax at the inception of the invention. We are often obsessed with the "heroic inventor" – Alexander Graham Bell, Thomas Edison, Ben Franklin, Tim Berners-Lee. Invention is important (as Plato said, "The beginning is the most important part of the work"), but it only provides the introduction of the story. Development, on the other hand, offers those factors that influence the maturation of the technology. It provides the details of what happened to and through the technology that made the artifact what it is today. Implicit to the process of technological development are social, political, and economic forces that form a grid of power relations in which technologies evolve. As Foucault argued, power relations *constrain the actions of* and *produce opportunities for* actions. Thus, no technology can be seen as an inevitable step forward; rather, only as an outcome of range of forces, interests, ideas, and actions.

Ambiactivity

It should be clear that when discussing the historical origins of any technology, it is critical to define what questions we seek to answer. Technological origins cannot be easily explained through linear representations of influence: does influence flow from humans to their technologies, technologies to humanity, both, or neither? No matter the answer, I suggest the geometry of such a relationship ($A - B \,//\, B - A$) is misunderstood. Such an understanding implies a particular chronology of influence – humans make technologies, which change the human experience, which changes what humans design

next, etc. This does not usually reflect the realities of technological evolution, in which power relationships are enacted in simultaneity, not sequentially. Also, the *A-B // B-A* model of technological development implies a symmetry of interaction: it is perceived that the forces at work offer equality in impact and influence. This is rarely the case. As Postman (1998) explains, "Technological change is not additive; it is ecological...What happens if we place a drop of red dye into a beaker of clear water? Do we have clear water plus a spot of red dye? Obviously not." So change from the human-technology relationship is qualitative, not quantitative. Lastly, the forces involved in technological development are often conceptualized as linear vectors. We often describe the interplay of forces within technological development as "interactional"– meaning relations *between* elements, or as "transactional" (Csikszentmihalyi & Rochberg-Halton, 1981), meaning *across* elements. This chapter introduces a new term which suggest a non-linear conceptualization of the network of forces involved – that of *ambiactional*, or relations encircling, encompassing, and environing elements. Instead of framing influence through vectors of force, *ambiactivity* implies forces acting through spheres of influence. Similar to a magnet, the influence of actors involved in broad scale technological change works in all directions. Through the examples found in the printing press and Internet, the encompassing relationships deeply mired in complex matrix of power, culture, and law will become apparent.

If technology and society embody an *ambiactional* relationship (as is evident in the example of buses in Manhattan surface transit), then we should consider the social, cultural, political, legal, scientific, and technological forces that created the Internet – why do we have the Internet and why now? An obvious answer rests in the development

of technology itself – that throughout the mid-twentieth century engineers developed the necessary computer hardware, software, protocols and infrastructure to allow them to communicate over wide-area networks. The 20th century's rapid advances in telecommunications and computing were certainly a requirement for the development of the Internet, but is technological readiness the only reason for technological development? This chapter argues otherwise.

Constructure

In my exploration of the conditions under which technologies develop, I will begin with the inception of printing press and the proliferation of print media in medieval Europe. The birth and growth of printing will serve as a case study to understand not only the circumstances that surround technological change in general, but those particular to informational technologies and representational media. Through the example of the printing press, I hope to show that while the basic ingredients for technological development may draw from economic, social, and technical spheres, radical shifts in representational media are associated with what I will term a *constructural gap*. *Constructure* is the relationship between representation of information and its epistemological effects. In other words, how information is represented influences what is represented. The type of informational technology in use, whether it is a song that is sung, or a book that is read, or a web site that is browsed, influences and sets limits on the kind of interactions with knowledge contained in the media. When representational media no longer offer the necessary informational architecture to support the production of knowledge, then such pressures contribute to the proper conditions for dramatic shifts in representations. Such a shift occurred in the development of the printing press, and I

believe the current germination of information dissemination found in the Internet represents the fulfillment of another constructural gap.

The Growth of Print Media

To begin, we must remove ourselves from our familiar 21st century context, and reach back through the centuries to a much different world. If the Internet represents a revolution in representation, then a good starting point in exploring its development may be found with a detailed treatment of the last great revolution in informational representation, the growth of print media as a result of the Gutenberg press. Printing is a good choice because "its impact on society can be viewed in full, from the stir made among the literate few by the first inventions in the fifteenth century to the effects of almost universal literacy among the western nations 400 years later" (Derry & Williams, 1961, p. 214). Other information technologies – such as language and writing systems – found maturity before reliable records were kept, while others – including photography, radio, TV, and film – are still too new to fully access their impact. Print media, however, is well positioned for the curious to explore both the conditions of its development and lasting impact of its use. This quest will take us back over a millennium to a Europe far different than the one we now know. In this example, the complex interrelations between technology and the social, political, and economic forces of the day will be confirmed.

Like the automobile, the birth of print media can be viewed as a predictable reaction to many of the prevailing conditions of the day. The need for what Eisenstein (2005) calls "typographical fixity" was firmly felt by the growing trade industries located in developing urban centers, by officials of the Roman Catholic Church who increasingly required standardize religious tracts to consolidate power and ensure uniformity in the

religious experiences across Europe, and certainly by the growing number of learning organizations such as universities also created a demand for printed books and pamphlets. Aside from a demonstrable need, Europe had also cleared the way for Gutenberg's revolution by slowly acquiring the various related technical necessities of mass produced print: oil-based ink, malleable metals for punches, screw-based presses, and paper. Many of these innovations diffused into Europe from Arabic and Chinese civilizations.

But also like the automobile, the printing press's story is more complicated than the proposition that need drove development. Though there was a demand for print and requisite pre-technologies were in place, the story of print is certainly not one that can be reduced to technological determinism. In the sections that follow, I will provide evidence that the general atmosphere for innovation was less than ideal and certainly not optimal, as a review of the need of print would indicate. Printing was for Medieval Europeans, a great surprise, prompting some to describe it as a gift from God. As the preceding paragraphs indicate, the road is long. The journey begins in Europe, 1000 A.D.

Small Villages, Big Problems

Around 1000 A.D., Christian Europe was understandably much smaller and disjointed than its modern counterpart, and even lagged behind other civilizations of the day. The European land mass was an "empty vessel ... a cultural, intellectual, economic, technological, and demographic backwater that paled before the technological and scientific vitality of contemporary centers of civilization in Islam, Byzantium, India, China, Mesoamerica, and South America" (McCellan & Dorn, 1999, p. 175). It is difficult to determine exactly why medieval Europeans lagged so far behind their

contemporaries. Some suggest that the European's ecological arrangement limited Europe's political and social development. These scholars argue that the combination of the regular rainfall in the spring and fall seasons, combined with the natural irrigation supplied by the streams of the European countryside, made the necessity for a centrally organized society less necessary. Civilizations in less amiable environments, such as the early Egyptians and Mesopotamians, established a pattern of collaboration as they built public irrigation systems (Derry & Williams, 1961). Other scholars point to the convoluted political relationships in Europe as damping the proliferation of innovation. Political elites required the authority of the Church and its clergy to legitimize them, and the clergy required spiritual and intellectual monopoly. Both parties would view the sporadic innovation and technological development as a possible threat to the long standing social order (Matossian, 1997). Still, others look to the enormous social and political upheavals of barbarian invasions as the root cause for the European technological setback (Tarnas, 1991). Whatever the reasons, the centuries leading up to the end of the millennium found Europe far behind most of the other medieval societies.

Villages in Europe were isolated communities, often separated by long walks lasting the better part of a day. The geographic separation related to the absence of transportation technology necessitated political separation, as monarchs in Europe struggled to exert their influence throughout their lands. The strongest unifying force of this time was the Roman Catholic Church. The Pope's arm extended throughout Europe, affecting most aspects of life in Germany, France, Italy and England, although more peripheral areas were characterized more by local traditions. Church dogma dictated existential and ethical meaning, symbolic life and daily activities for most of the

continent's inhabitants. There was no visible separation between Church and state, or even Church and science. The people of Europe were, on the whole, a religious people who worked hard to earn penitence for their transgressions, and dutifully supported the activities of the Church in Rome (including paying taxes used to build enormous basilicas and finance crusades against the Muslims). This created a society comprised of a vast majority of uneducated, illiterate peasants, and a small caste of political and religious elites. Such a society was far different than that of China, which as early as the Sung Dynasty (960-1279), featured civil services exams and government funded schools to extend the possibility of acquiring wealth, prestige, and power to all its citizens (Matossian, 1997, p. 69).

An Agricultural Revolution

Between 1000 A.D. and 1500 A.D., Europe experienced an Agricultural Revolution. While Europe's population remained considerably smaller than that of the Islamic empires, India, and China, the population of Europe as a whole did rise 38 percent between 600 and 1000 (McCellan & Dorn, 1999, p. 177). The increase was due to moderate improvements in agricultural technology which then increased calories and population and put additional pressures on existing farming methods. The Agricultural Revolution in Europe was primarily spurred on by the adoption and development of several key technologies designed to harness power, including the waterwheel, the windmill, horse collar, stirrup, the three-field rotation system, and heavy plow (Derry & Williams, 1961; McCellan & Dorn, 1999). "With such inventions, the natural environment began to be exploited with unprecedented skill and energy," writes Tarnas (1991, p. 173). Most importantly for Europeans, the proliferation of agricultural

technology satisfied the demand for increased food production while decreasing the amount of human power required. With their "fascination for new machines and new sources of power ... medieval Europe became the first great civilization not to be run primarily by human power" (McCellan & Dorn, 1999, p. 180).

The agricultural advancement of Europe from 1000 to 1500 A.D. should not be overstated. I offer three reasons for such a disclaimer. First, for most Europeans, the Agricultural Revolution that began around 1000 was quite conservative in its social effects. The implementation of the heavy plow, an enormous instrument consisting of an iron plow fixed on wheels, required the strength of eight oxen to pull it. The cost of this equipment was well beyond the reach of the typical European peasant, and thus reinforced the strength of the stratified feudal system. The stirrup had this same effect, as it created the possibility for knights to stay mounted during combat. With armor, lance, shield, and sword, a mounted cavalry of knights were a formidable, but expensive military force. Thus, knights generally provided protection to their feudal lords, who could afford to equip and pay them. With feudal lords firmly in charge, the typical serf was hard pressed to feel any of the "liberating" effects of the Agricultural Revolution.

Second, even though the Europeans had become far more adept at feeding their population, their understanding of the natural world was still largely incomplete. This is illustrated by the enormous distress cause by the unforgiving and unexplainable epidemic that was swept across Europe in the fourteenth and fifteenth centuries. The Bubonic Plague, or Black Death, was the name for deadly bacteria which spread via fleas (often carried by rats) to humans. The disease gathered its name-sake from the little dark swellings, "buboes," which appeared over the infected lymph nodes. For most of those

exposed, an unpleasant death was a near certainty. The effects of this epidemic are particularly shocking to modern eyes: some estimate that one out of every three Europeans died from the Black Death. And if one-third of Europeans died from the plague, the remaining two-thirds were deeply affected by the mysterious nature of the disease. As Man (2002) describes, "Of the causes, no one knew anything at all at the time, and therein lay the true horror...It is the lack of explanation that unhinges minds" (p. 21).

Third, though agricultural technologies helped meet the demand for calories by medieval Europeans, it did not necessitate a rational, orderly community. Black magic and devil worship flourished inside European villages. Many of these rituals featured "group flagellation, the dance of death in cemeteries, the black mass, the Inquisition, tortures and burnings at the stake...Apocalyptic expectations abounded" (Tarnas, 1991, p. 225). The Church itself, though a core institution, was rampant with corruption and decadence. Its lack of spiritual integrity was unsettling.

Gutenberg's Quest

So was the world occupied by Johann Gutenberg (1400-1468) – one of ignorance, fear, struggle, and separation. He lived in a time filled with doubt and uncertainty, a socially and economically stratified era that made economic mobility a contradiction in terms. Born in a family with some economic means, Gutenberg should have been slated to pursue the comfortable life of a patrician, but due to his mother's low birth as a shopkeeper's daughter, Gutenberg was restricted in his economic opportunities. Both his father and his uncle were Companions of the mint, which certainly exposed young Gutenberg to the art of coin making, but given his low social status, Gutenberg knew he

could never work for the imperial mint. This probably seemed to Gutenberg a bit of bad luck, but what he could not have known was that those informal lessons of his youth would be quite instrumental in what lay before him, a project of grand ambition – the development of movable type.

Though Gutenberg received no substantial inheritance, no privileged access to aristocratic life, and no significant property rights from his family, he was provided a quality education. Young Johann attended schools in his hometown of Mainz, Germany in which he learned printing, Latin, and other skills that would bear well in his future endeavors. Once of age, Gutenberg set out to make his fortune. The story of his entrepreneurial trials and tribulations is a long and complicated one, but to summarize, Gutenberg regularly demonstrated a prescient foresight for market opportunities. This can be illustrated through Gutenberg's development of the press, but even before this, he recognized a good opportunity when it presented itself. For example, when large masses made regular journeys to Aachen to view the holy relics stored there, very few of the thousands of pilgrims could get close enough to touch the relics. Some in Aachen suggested that pilgrims use small mirrors to harness the power of the relics from afar, in the event that they could not touch them. Seeing an enormous market (tens of thousands made the pilgrimage) with an insatiable desire for supernatural assistance against the Plague, Gutenberg borrowed money to mass manufacture the mirrors. It is unclear whether Gutenberg was successful in this endeavor, though delays caused by fresh epidemics of the Plague did not help his fledgling business. What is clear from this example is Gutenberg's ambition and his desire to build wealth – the same motives that drove his pursuit of movable type printing.

Catalyst for the Gutenberg Press

The catalyst for movable type's development was not a technological one – actually, the underlying tools for Gutenberg's system had existed for a long time in Europe, and even earlier in Asia. Pi Sheng in China developed a movable type system out of wet clay in the eleventh century; inventors in the Korean continent were the first to construct movable type from metal, printing the fifty-volume *Prescribed Ritual Texts of the Past and Present* in 1234 (Matossian, 1997). If the creative cultures in East Asia produced movable type centuries before Gutenberg, why are we not talking about the revolution of print media that spread from the East outwards, rather than a European germination? Why was Gutenberg's solution so successful? Did he provide a better technology in the fifteenth century than the Chinese or Koreans had available to them? This is possible, but not likely. While China's paper was not suitable for printing press operations and they lacked the availability of wine presses from which to model their printing press, China was still a leader in scientific and technological innovation, producing many tools earlier than their Western contemporaries. It would appear that Gutenberg's advantage, according to Man's (2002) thorough account on the matter, can be reduced to the differences in writing systems between the East and West. Gutenberg's advantage lays in the simplicity, flexibility, and scalability of the Western practice of alphabetic writing systems. As Man (2002) describes, "The genius of the alphabet, the underlying principle – is that it uses a few symbols, typically between twenty-five and forty, to represent the whole range of linguistic sounds...Its astonishing power comes form its vagueness, its fuzziness, its flexibility, its ability to record anything spoken simply by rearranging the same few symbols" (p. 102). By relying on a small set of

symbols to represent the range of sounds in a language, alphabetic systems were far easier to adapt to movable type. Gutenberg's advantage was that he need only determine how to mass produce the stamps for each of the twenty-five to forty letters. To accomplish the same feat with the pictorial language systems of Asia, such as Chinese, would require a movable type system that would accommodate over 40,000 different symbols. Clearly, the challenges of pictorial language systems could not be easily met with 13th century technology.

The Demand for Print

Having a writing system that was easily adaptable to mechanization, Gutenberg had an enormous advantage in creating his printing press, but there were certainly other factors that made for an environment conducive to this technological development. One can also make the case that Europe in the Middle Ages was ripe for the advent of movable type, and had Gutenberg not developed it, someone else would have met the growing demand for books. What follows are three growing markets for standardized print media.

A standard church.

In particular, the Roman Catholic Church had a growing need for standardized texts (missals) of worship. Some in the Church hierarchy, most notably Nicholas of Cusa, dreamed of unifying the Christian experience for all worshippers across Europe. Standardizing the liturgy, song book, and prayer book was one way of unifying the Church and also reaffirming that the locus of control for Catholicism hovered over the Pope's quarters in Rome. This could only be done if Rome controlled the production and distribution of all official Church texts. Most of Europe was still illiterate at this time,

though most priests were literate and able to read official church theology. Hence, from the Church's perspective, if they can control the information received by the priests they could standardize the Christian experience throughout Europe, sacrificing autonomy and spontaneity for control, assurance, and predictability (O'Donnell, 1998, p. 37).

A standard trade.

As the Middle Ages progressed economically and socially, literacy and education became increasingly important, affecting Europe's demand for printed material and books. With increasing regularity, Europeans expanded sea exploration in the pursuit of trade. It is suggested by Derry and Williams (1961) that "in the Middle Ages transport costs were a smaller proportion of total costs than at present day" (p. 203). The economical viability of sea travel combined with the technological improvements in navigation (improvements on the Chinese compass and increased efforts in map making) made sea voyages a growth industry. Increased trade associated with these efforts required a more standardized form of print literature. Maps needed to be shared amongst navigators, contract language needed to be developed and disseminated between traders, and measurement of goods needed standardization. Mass printing would prove quite valuable to the growing merchant class of the Middle Ages. With the possibilities of mass production of print, Ortelius made his *Theatrum* a living atlas, frequently incorporating the feedback of his vast readership into his next edition – a total of 28 such editions by the time of his death (Eisenstein, 2005, p. 82).

A standard education.

Institutions of advanced learning began to slowly emerge throughout the Middle Ages. In 789 A.D., the Frankish King Charlemagne issued a decree for the formation of

"cathedral schools" in order to guarantee a reliable supply of literate priests. Secular universities began to develop before 1200, and by 1500 there were around eighty such institutions scattered around Europe (McCellan & Dorn, 1999, p. 183). In the early twelfth century, Hugh of Saint Victor proposed a radical battery of secular topics for study at the Augustinian Abbey in Paris. Hugh's curriculum, in support of his mantra of "learn everything," included subjects such as mathematics, grammar, rhetoric, music, astronomy, among others (Tarnas, 1991, p. 185). This increased attention toward learning by the Church and state would quite naturally indicate a general need for less expensive, more reliable, and more diverse collection of printed texts.

As the fog began to lift from Europe's "dark ages," the desire for printed materials also rose. People began to read and write in their own language (rather than the academically inclined Latin), and private collections of books became more common, particularly of the wealthy patricians. Yet, scribes could only copy around two high quality, densely configured pages per week, leading to a burgeoning supply-demand problem (Man, 2002). Manual reproduction was inadequate to meet the supply of texts in the face of increasing demand, and the imbalance contributed to enormous cost of printed materials. In the late fourteenth and early fifteenth centuries, a single medical book required three months' cost of living for the average person and a single law book sold for the equivalent of sixteen months of living expenses (Matossian, 1997, p. 80). Not only did the scribes have difficulty keeping up with the demand for print media, they also had difficulty ensuring accuracy. Late medieval scribes were supervised, but the controls often quite lax (Eisenstein, 2005, p. 56). After hours of hand copying, scribes were bound to make mistakes, and some even intentionally altered the received text. This

created problems for the Church and its orthodoxy, as well as for those in the academic realm (teaching materials that contained mistakes, inconsistencies). So, while the continent was mired with plague outbreaks, political and religious problems (which were one and the same in those days), civil wars, and general angst (due to fear of the Plague), it still became increasingly clear that if someone developed a way to mass produce inexpensive *but accurate books* they would gain enormous fame and fortune. It certainly seems that this message did not elude Johann Gutenberg.

The desire for standard religious experiences, standard education, and standard trade all likely contributed to Gutenberg's breakthrough. This short list of factors is meant to illustrate that Gutenberg's accomplishment did not occur in a vacuum. The climate of Europe at this time was one well-disposed for the development of the printing press. It had the necessary technological preconditions and a growing desire of its religious, economic, and political leaders for the advantages in control of text that standard print allows.

Gutenberg's Breakthrough

Given the ripe market conditions and the availability of the necessary tools (metal punches for lettering, screw-driven presses, high-quality paper), Gutenberg labored through the remaining technical challenges (ink quality, assembly of characters on the press, reproduction of punches) to create the West's model for movable type. His success came in 1447, when he began to successfully mass produce a standard text on Latin grammar called *Ars Grammatica.* Gutenberg would argue that his books were not merely as good as those produced by scribes, but they were actually superior in their presentation and accuracy. His work spread rapidly through Europe, as trained apprentices often

ventured to new towns (those with significant Churches, universities, and schools) to start their own printing operation. By 1480, only twelve years after Gutenberg's death, 122 towns in Western Europe had at least one printing press (Man, 2002). By 1500, there were nearly 40,000 recorded editions of books produced by printing presses in fourteen European countries (though the presses of Germany and Italy account for two-thirds of these) (Derry & Williams, 1961, p. 240). The 40,000 titles produced from 1450-1500 totaled around ten million copies. This substantial collection of early printed materials has been termed the *incunabula* or "cradle" of print (Boorstin, 1983; Matossian, 1997).

Though the amount of printed materials saw a meteoric rise within the first fifty years of the printing press, it should be noted that an increased abundance of text does not necessitate the equal distribution of text. Some suggest that over three-quarters of the texts produced before 1500 were in Latin, the language of the educated elite and clergy (Moss, 2000). Not surprisingly, religious works dominated this distribution, accounting for nearly half the published texts, followed by classical, medieval and contemporary literatures comprising over thirty percent of all printed materials.

The Legacy of Print Media: Scholarly Effects

The rapid rise of book production in Europe left an indelible mark on the political, social, religious, and academic landscape, and most certainly movable type affected the academic realms in several tangible ways. Before the printing press, books for academic inquiry were exceedingly rare, requiring those that wish to consult a variety of texts to assume the identity of the "wandering scholar" (Eisenstein, 2005). Boorstin's (1983) picture of scholarly life before the printing press is particularly vivid:

> In the heyday of medieval libraries books had been so valuable that they were chained to their shelf or to a horizontal bar above the desk where they were to be

> consulted. The symbol of the old library was the chained book...None of the consequences of printing was far more far-reaching than the power of the press to free books from these chains. (p. 534)

Not surprisingly, Gutenberg's work changed all this by allowing academic texts to gain a much wider distribution and readership, and extensive travel was no longer a requirement to consult different books. Print abundance also provided medieval scholars the opportunity to form a consensus over the critical questions of their field. The fragmented efforts of individual scholars began to coalesce into fields of studies. Contradictions and opposing viewpoints became more visible, and the nature of academic activity changed. Eisenstein (2005) describes that "successive generations of sedentary scholars were less apt to be engrossed by a single text and expend their energies in elaborating on it. The era of the glossator and commentator came to an end, and a new 'era of intense cross referencing between one book and another' began" (p. 47). Academics discovered the creative value of cross-pollination, and this led to new species of academic and literary discourse. This period was witness to the rise of new forms of writing, specifically essays and novels. This germination can also be attributed to the standardizing effects of the printing press. While movable type increased the "combinatory intellectual effects," it also created uniformity through its mass production. Soon, artists and writers developed new forms of writing as a reaction against the standardizing effects of the printing press, such as the Essays of Montaigne (Eisenstein, 2005).

Academic inquiry steadily increased, coupling the discoveries from the new world with a much more effective distribution technology that would eventually lead them directly into the Renaissance. And while these are important changes to Europe's

landscape, the greatest changes associated with the proliferation of print lie in the arenas of politics and religion.

The Legacy of Print Media: Religious Effects

The Church in Rome initially viewed this new technology with great favor. Movable type provided the Church with resources to help finance the Crusades through the selling of indulgences, and it also was a helpful resource in Rome's efforts to standardize religious activity across Europe through its common texts. The Church desired a unified Christianity, one that participated in common worship through identical texts creating a consistent and predictable religious experience that began (in effect) in Rome. I do not mean to cast such actions as controlling or hegemonic; rather, I only mean to acknowledge that control is a fundamental characteristic of printed text. As O'Donnell (1998) argues, "Yet the most important feature of such a text is not what it does but *that* it does what it does: it makes the life of a community depend neither on spontaneous choice nor on the orally assimilated customs and wisdom of the past nor again on a charismatic leader, but rather on specific rules and regulations written down on a page" (emphasis in original, p. 37). Thus, movable type's benefit of standard text did structure the experiences of parishioners around Europe in a particular fashion; however, as is often the case, use of technology often runs in unforeseen directions. The technology of movable type introduced many unintended effects.

The role of Martin Luther.

While control over religious experiences was desirable to papal officials, the Church's honeymoon with the printing press was short lived. The Church's perspective drastically changed as Martin Luther, the now infamous monk from Germany, effectively

fractured the Church over disputes ranging from theological disagreements to corrupt practices. Luther's Protestant Revolution began with a common theological question, one that has interested professors of theology and lay people equally: What must one do to be saved? Luther's answer came from his study of the Bible, in which he found that it was through God's grace alone that humans could be saved (Tarnas, 1991). Medieval Catholic doctrine emphasized both grace and good works as the two required elements of salvation. Additionally, Luther objected to other practices of the Church. He rejected the practice of pluralism (holding of multiple office by Church officials) and the selling of indulgences, in which one could pay the Church to deliver a soul from purgatory. It said that Monk Johann Tetzel pumped his sales with the slogan, "As soon as the coin in the coffer rings, the soul from purgatory springs" (Duiker & Spielvogel, 2001).

The reformers.

In many ways, Luther's actions were congruent with the activities of a small, but growing line of religious reformers (or dissidents – depending on your perspective) that preceded him. Prior to Luther, Christian Humanists (most famous of which was Erasmus) argued the Christianity should be enacted as a set of values that affect daily living rather than a comprehensive, systematic, and dogmatic theology (Duiker & Spielvogel, 2001, p. 426). Reformers such as Jan Hus and Jerome paved the way for Luther by speaking out against Church doctrine in sermons and attacked papal authority through their writings (Man, 2002). Even Luther's most famous act – the nailing of the ninety-five theses against the Church doors at Wittenberg – was not inherently revolutionary. "It was entirely conventional for professors to hold disputations over an issue such as indulgences, and 'church doors were the customary place for medieval

publicity,'" writes Eisenstein (2005, p. 168). How then did Luther find himself at the center of one of the most important moments in the history of the Christian Church?

Factors that aided the Protestant revolution.

There were several factors that undoubtedly fed Luther's Protestant Reformation of the Church. Certainly, the political environment in Germany gave aid to Luther's case. Germany was a land of several hundred states, all which strove for greater independence from the Holy Roman Emperor, Charles V of Spain. By supporting Luther, they were undermining not only the sovereignty of the Church, but of the throne in Spain as well. But politics alone cannot explain the religious revolution led by Luther. Certainly, Luther's theological message would have a certain popularity with many practicing Christians (particularly the peasantry). He advocated for the "priesthood" of all believers, removing the formal clergy as a necessary intermediary between the people and God. He also wrote that the people should read and interpret the Bible themselves, and supported his position by translating the Bible from Latin to the native language of the Germans. However, Luther's translation of the Bible from Latin to German would not have found an audience without the final cause of the Protestant Reformation: the printing press. Luther's ideas spread throughout Germany primarily because the printing press made the replication of Luther's tracts quick, efficient, and inexpensive.

The immediate outcome.

Combining Luther's prolific propensity toward publication and the new possibilities of movable type was a powerful combination: it is recorded that during one seven year stretch, a third of all printed materials in Germany were authored by Luther (Man, 2002). Between 1517 and 1520, Luther's thirty publications likely sold over

300,000 copies – an enormous amount for the time period. The Church, who had once exercised complete control over Middle Age media outlets – the scribes, artists, and priests – suddenly had lost its monopoly to a simple monk in Germany. Luther's audacity enraged the papal authorities and Charles V of Spain, who denounced Luther at Worms: "a single friar who goes counter to all Christianity for a thousand years must be wrong." Officially, Luther lost his battle with the Church, having been made an outlaw in the empire by the Edict of Worms, but Luther's revolution continued, culminating in an international Protestant movement – one that drew from other religious luminaries such as John Calvin and Ulrich Zwingli. One must wonder: if Luther did not have the advantage of the ubiquitous presence of his writings around Germany, would he have been as successful? Most scholars think not. As Eisenstein (2005) suggests, "...it seems difficult to exaggerate the significance of the Press, without which a revolution of this magnitude could scarcely have been consummated" (p. 164). Tarnas (1991) makes a similar conclusion: "Without [the printing press], the Reformation would have been limited to a relatively minor theological dispute in a remote German province" (p. 223).

Insights from the Print Media Revolution

To summarize, this chapter has provided what I hope to be an adequate, though certainly incomplete, discussion of the rise and impact of movable type in Europe. In the example of movable type, we find strangely fertile soil for technological innovation. To be sure, there was a growing need for the mechanization of printing, a need felt by the Church and the nascent academic community consisting of schools and early universities. Church officials, particularly Nicholas of Cusa, recognized the advantages of standardized religious tracts would have in advancing their goal of unity across the

Church. Certainly, universities needed accurate and readily available texts to achieve their common missions. Yet, in 1455, all of Europe's printed books would have fit in a single wagon from that era (Man, 2002). This statistic first demonstrates the enormous need for printed materials, but it also illustrates the far reaching impact Gutenberg's work had on the proliferation of print media. We also see from this example that radical technological shifts, such as the one from scribe to movable type, cannot occur without a sufficient technological base. Gutenberg's advantage over his Asian colleagues was that the basic technologies to create an effective printing press already existed in Europe at the time of his experimentation: the screw-based press, appropriate paper, an alphabetic writing system, metal punches, etc. Gutenberg's challenge was leveraging these various technologies to create a simple, but effective metal-based, movable type printing press. In this way, he can be thought of as an integrator as well as an innovator.

Yet, as hungry as the Western world may have been for the printing press prior to its invention, and despite the well-established technological base that existed at that time, movable type was a surprise to many. Europe had yet to fully recover from the ensuing political and social chaos that followed from the fall of the Roman Empire. The environment of those times was particularly orientated to the mythic and supernatural, rather than the scientific. European society was still rigorously stratified, which exerted a certain measure of influence on those who aspired to a better life. And not to be underestimated was the general feeling of anxious despair associated with each wave of the mysterious but deadly plague that seemed to operate without rhyme or reason. It is these unfavorable variables that make 15th century Europe a perplexing stage for innovation. We must reconcile the contradictory nature of the medieval European

environment for technology development – on one hand, we have the many technologies that took root in Europe from 1000-1500 A.D., and yet at the same time, we find a Europe struggling against the black plague, confused religious identity, stratified societies, and controlling religious institutions. As we examine the development of the Internet, we will find this same curious contradiction in its conditions for development.

The task of the next chapter is to determine how to connect the lessons learned about technological change and the printing press to an on-going investigation of the Internet. It is my belief that looking back at the development of movable type will provide insight into the future implications of the Internet, particularly the *ambiactional* relationship between technology and society.

CHAPTER 3
A GENEALOGY OF REPRESENTATIONAL MEDIA

The previous chapter introduces important themes for the development of technologies, and two of these themes – *ambiactivity* and *constructure* – will continue to be emphasized in this chapter. In Chapter 2, I attempted to show through the development of print media, how forces work through spheres of ambient influence in such a way as to create a complex environment for innovation and development. Print media was both highly probable and a great surprise. In this chapter, I will argue that this same pattern holds true for the Internet. As the development of technology is as much about its effects as it is its origins, I will continue to trace the impact of the printing press through the centuries that led up to the Internet. The collection of print media effects I will present and how these effects form the basis of the field of influences from which the Internet emerged will represent my modest attempt to describe the genealogy of representational media from the printing press to the Internet.

Changes Associated with Standard Print

Typically, what follows in the story of technology after the Gutenberg press is a discussion about the dawning of the Scientific Revolution and the Renaissance. The period following the Reformation is truly a remarkable one in many ways. Within one generation of Gutenberg, we find the works of the great Italian masters (Leonardo, Michelangelo, Donatello, and Raphael), Columbus lands in the New World, Luther initiates the Protestant Reformation, and Copernicus shatters worldviews with his heliocentric universe (Tarnas, 1991). It offers a broad expansion of the scientific toolbox with development of observational technologies including the telescope, the microscope,

the first precision clock, the thermometer, barometer, and vacuum pressure (Westfall, 1977).

Yet, to offer a general survey of the technological and scientific accomplishments following the close of the Middle Ages is only to tell part of the story. Missing from such a review are the less tangible but equally influential changes to the scientific landscape. Coupled with the groundbreaking works of many scientists was a dramatic transformation in the nature and work of science. A new model for scholarship and research established itself in the years that follow the printing revolution, one that increasingly emphasized scientific community over the activity of the lone scholar. With developing scientific communities came new ways of operating as scientists, including a scientific classification schema, scientific discourse, and scientific method. "Scientific thinking" emerged, diminishing the influence of mystical, ancient, or animistic approaches of explaining natural phenomena in favor of a mechanistic perspective. Such changes required centuries to unfold and find maturity; however, even in the work of those luminaries immediately following the development of the printing press show evidence of an emerging scientific mindset.

Depersonalizing the Universe: From "Motive Soul" to "Force"

One of the most visible effects of the printing press was the expanded possibilities for academic inquiry. By the mid-fifteenth century, the diffusion of the Greek originals and the discovering of lost sources, such as Archimedes, promoted the reconnection with antiquity's efforts to discover the mysteries of the physical world. Not only did ancient works enjoy increased circulation, but scientific literature was also being printed in English, French, Italian, and Spanish rather than only in academic Latin. "Science

became public like never before," writes Boorstin (1983, p. 517). With new tools and rediscovered scientific treatises in hand, scholars resumed old problems as well as explored new ones. For example, Copernicus proposed a heliocentric model of the universe as a solution to the inaccuracies of Julian Calendar. Up until this point, the acceptable model was the infamous Ptolemic universe, which found the earth at the universe's center, surrounded by various spheres that moved the stars westward around the earth and the planets and Sun eastward. In *De revolutionibus*, Copernicus posited but did not prove a new model for the universe that placed the Sun at its center. His work was only conceptual in that it was not based on new data, and in many ways paid homage to ancient astronomy. This has prompted some to suggest the Copernicus was a conservative revolutionary whose work should not mark the beginning of modern astronomy. "The key to understanding Copernicus's life and his work," write McClellan and Dorn (1999), "comes with the recognition that he was the last of the ancient astronomers, not the first of the moderns" (p. 208). But in those that followed, such as Johann Kepler, we see the evidence of the dramatic shift of scientific culture.

Kepler's scholarly endeavors embody many of the subtle shifts in scientific work. In his first great work *Mysterium Cosmographicum* in 1596, Kepler sought to confirmed Copernican astronomy through the rhetoric of the ancients. He observed that the Coperincian model for the universe offered one less planet (five instead of six) because the moon would no longer qualify as a planet if the Sun were the universe's center. Kepler argued that this change is harmonious with God's fundamental order of the universe. Because there existed only five regular geometric solids, these solids must define the space between the six planets. "Like Copernicus before him, Kepler had drunk

deeply at the spring of Renaissance neoplatonism, and imbibed its principle that he universe is constructed according to geometric principles," writes Westfall (1977, p. 4). As a young scientist, Kepler relied on geometric symmertry and platonic solids to guide to inform his scientific belief. Writing to Galielo, Kepler drew inspiration from "Plato and Pythagoras, our true preceptors" (Tarnas, 1991, p. 256). However, his later works indicate a change in position about the source of scientific knowledge and scholarly inspiration.

In *Astrononmia Nova* (1609), Kepler moved away from the perfect circles and geometric modeling of neoplatonism, and instead proposed a more machine-like model of the universe. He revised *Mysterium Cosmographicum* in 1621 to reflect a less animistic explanation of the universe by modifying his terminology for the power that drew large planets into orbit. Originally, he referred to the Sun's power as *anima motrix*," a "motive soul" which compelled the order of the universe. In his second edition, he replaced *anima motrix* with *vis* or "force" (Westfall, 1977).

In the seventeenth century, the machine model became popular in the thinking because of devices like the clocks affected the way in which scholars and scientist viewed the world. The machines began to function symbolically as models for human behavior, organization, and life (Pacey, 1990). Pacey argues that "[The Machine] had become a model of the good organization, and in addition, was being used as a tool for the regulation of organizations, as working hours were increasingly defined by the clock. Even an army's drill in marching or firing might be done to time" (p. 100). Tarnas (1991) reminds us that the modern view of the universe is one of a machine, "a self-

contained mechanism of force and matter, devoid of goals or purpose, bereft of intelligence or consciousness, its character fundamentally alien to that of man" (p. 326).

The machine as a model for understanding our world certainly has currency today, as evidenced through popular phrases: effective entities run like clockwork; we want our organizations to work like a well-oiled machine; we put the wheels in motion; when things get messed up, something threw a wrench in the monkey-works. These modern colloquialisms reflect an understanding of the universe that finds its roots during the Scientific Revolution. They also reflect the cultural dependence humans developed for machines. Associated with the rise of printing was the broadening of academic inquiry, creating a new scientific mindset that encouraged human beings to place their faith in tools rather than mystic forces. Scientific thinking saturated the market of ideas, affecting a wide-range of disciplines. In continue tracing the genealogy of representational media by discussing the methods of science and the science of sorting.

A Method for Science

Kepler's scholarship signifies the shift in scientific work. Gradually, scientists looked less to the observations of the ancients for insight, and more to the natural world. "The progressive forces of the seventeenth century came to see as mistaken the preoccupation of medieval natural philosophers with the works of the ancients, especially Aristotle, and also with the Bible, as the sources of scientific knowledge," notes Chalmers (1978, p. 1). In the place of the sacred texts of the Bible or the prestigious writings of Aristotle was a revered process, what we commonly call *the* scientific method. Bacon's *Novum Organum* gave the emerging scientific community a standardized method to conduct their work. Rather observing nature as it presents itself,

science was seen as the active, highly political, and power driven control of the natural environment by the experimenter. Science found its new root in data: rather than fitting observational data into a world view, as many medieval scholars had done, the new guard like Galileo practiced an early form of grounded theory in which they developed scientific principles which fit the data. As Foucault (1973) explains in *The Order of Things*, this was not always the case:

> Up to the end of the sixteenth century, resemblance played a constructive role in the knowledge of Western culture. It was resemblance that largely guided exegesis and the interpretation of texts; it was resemblance that organized the play of symbols, made possible knowledge of things visible, and controlled the art of representing them (p. 17).

Less often did scientists and scholars engage in analogous thinking, in which they searched for meaningful relationships in nature with "plants holding within their stems the secrets that were of use to man" (Foucault, 1973, p. 17). Rather, the attention of the broader scientific community turned away from finding connections to the past to building a framework for scholarship in the future.

Sorting, Organizing, Naming, and Arranging

As many have noted, advancements in representational technology (the printing press), instruments of investigation (microscope, telescope, thermometer, barometer), and method of research (scientific method) did fuel a broad increase in scientific research and activity. Observational data from the natural world grew rapidly, yet new information did not directly mean an increase in knowledge. What science initially lacked were effective methods to organize information, though it was not from a lack of effort. Konrad Gesner (1516-1565) produced seventy volumes over the course of thirty years, detailing every conceivable subject. Yet, such efforts were reliant on an alphabetic

arrangement, which would understandably vary, depending on the language of the catalogue. Thus, naturalists needed a means by which they could name plants and animals independent of the vernacular. Without a new organizational scheme, it would be difficult for scientists scattered around Europe and elsewhere to collaborate and build off each other's ideas. The solution to this dilemma was provided by two great systematizers – Ray and Linnaeus.

The combinatory effects of Ray and Linnaeus' work would be the production of a comprehensive *systema naturae*, an organizational scheme for the botany and zoology. Ray's contribution was his development of the concept of *species*, "*a set of individuals who give rise through reproduction to a new individuals similar to themselves*" (Boorstin, 1983, p. 434). Linnaeus added to Ray's species the category of genus to form a universal binomial system for naming plants and animals. Recognizing the inherent problems in grounding his work in any of the national European languages, Linnaeus revived the use of Latin for an international naming system moving on to provide labels for all fifty-nine hundred known species during his time. Now, scientists could name the parts of the natural "machine." On this surface this may appear to be a rather mundane accomplishment, but Linnaeus created a robust framework to classify and organize the ever growing body of scientific knowledge. This prompted some to declare, "*Deus creavit, Linnaeus disposui*" or "God created, Linnaeus classified" (Boorstin, 1983).

Linnaeus and Ray served as early organizers of scientific information. What followed their work was centuries of effort in providing structure and order to the growing body of scientific work. As Pickston (2001) explains, the early modern period is characterized by 'natural history' (description, classification, display), the nineteenth

century is characterized by 'analysis' (mechanical abstraction, measurement, reduction to elements), which is the again succeeded by systematically innovative ' experimentalism ' (more and more laboratories, synthesis). Sorting, organizing, and classifying extend to human subjects as well. Through his work, Foucault develops a vocabulary to describe the categorization of human subjects. For Foucault, dividing practices were instrumental in the creation of human subjects. Dividing practices form subjects by division, separating one classified group from another, such as the sane and the mentally ill, the sick and healthy, and the criminal and the law abiding. More than creating a sorting mechanism for the classification of human subjects, dividing practices establish dominant discourses or norms by which human behavior is judged. Through time and scientific authority, such discourses are taken for granted as "natural" divisions within human behavior, and internalized in human perspective (for more detail, see Chapter 4). The utility of dividing practices are no more evident than in the activities of doctors and scientists in the eighteenth century.

In the development of modern medicine in the eighteenth century, doctors "hierarchized" disease into families, genera, and species. Rather than relying on old myths and the language of fantasy, the emerging modern medical community described human health with "qualitative precision." Through the similarity of diseases, doctors leveraged an expanding medical vocabulary to provide a rational order to the study and treatment of illness. Employing what Foucault (1994a) described as a medical "gaze," physicians were encouraged to "abstract" the patient; that is, to separate those symptoms of a disease that necessarily accompanied it from those that were "accidental," "fortuitous," or "depend on the temperament and age of the patient" (p. 8). The

organization of medicine and disease indicated that not only would lower animals and plants be classified, sorted, and made subjects of scientific inquiry (as in the work of Ray and Linnaeus), but the human beings as well. Modern medical discourse created a "Western man [who] could constitute himself in his own eyes as an object of science, he grasped himself within his own language, and gave himself, in himself and by himself, a discursive existence, only in the opening created by his own elimination..." writes Foucault (1994a, p. 197) in *The Birth of the Clinic*. The birth of the medical clinic marked the settlement of the human subject as the final frontier for scientific, mechanistic thinking. For Foucault, "it is understandable, then, that medicine should have had such importance in the constitution of the sciences of man – an importance that is not only methodological, but ontological, in that it concerns man's being as an object of positive knowledge" (p. 197).

Foucault's work reveals that scientific classification, subjectification, and objectification applied to not only plants, animals, elements, but also to human beings as well. We all have become data. Through systems of scientific knowledge, individuals have been defined and divided, and the long term accumulation of the organization of humanity has produced enduring existing social structures. Humans are active participants in their own categorization. These structures develop social expectations through which people define themselves through a process of normalization, the categorization of humans "in finely graded and measurable intervals around a norm." Categorical thinking was created by humans for humans. Those that deviate from norms are classified as "anomalies" to the "social body" and are subject to "corrective technologies" such as schools, prisons, and mental hospitals (Schillo & Thompson, 2003,

p. 2991). As the modern era matured, humanity had categorized much of the life on planet earth, and even turned its scientific gaze inward, categorizing the thoughts, feelings, and emotions of the soul.

From Classification to Industrialization

In several ways, the new emphasis on the classification of knowledge is not surprising. As mentioned in the preceding section, there was a practical necessity for taxonomical thinking. The intensity of scientific research had increased through the Scientific Revolution, and one of the results of this sustained increase in scientific activity was the birth of the "scientist." Before this time, those interested in science were the same scholars who held passions in a variety of fields. The Scientific Revolution offered the whole groups of men who would assume the label of "scientist." Not content to work in isolation, these scientists organized themselves socially forming broad scientific organizations. "On the ground once trod by prophets an organized church now stood," writes Westfall (1977, p. 105). In order for international scientific communities to flourish, knowledge needed some organization. Standardized cataloguing and labeling was a "natural" taxonomy for the knowledge in the centuries that followed Gutenberg. The book itself was well inclined to this organizing principle, as the development of the index accompanied the development of standardized print. Hierarchical thinking seemed congruent with scientific thinking organized by Bacon. Cataloguing also draws inspiration from mechanistic thinking. With increasing regularity, scientists began to think of the world as a system of machines. By describing "life" by its parts was harmonious with the machine thinking that took root in the sixteenth century.

Yet Foucault argues that sorting, organizing, and classifying are always acts of power, never a neutral or "natural" enterprise. So while the book (and the tide of scientism associated with the rise of print) might have been well-adapted to the hierarchy of the index, these organizational schema are not without power or politics. No organizational scheme escapes the grid of power relations, even the relative absence of organization. Freeman (1973) amplifies this position in her classic text on "The Tyranny of Structurelessness." Set in the context of the women's liberation movement, Freeman shows that "structurelessness" is "organizationally impossible" and that while structures may be "flexible...varying over time...[and] unevenly distribute tasks, power and resources over the members of the group," they are not absent. There is no politically neutral organizational structure just as there is no "'objective' news story, 'value-free' social science, or a 'free' economy." Power pulses through every part the mesh of people, information, ideas, and institutions. In other words, factors of techo-scientific development are *ambiactional*, acting as environing spheres.

This perspective on power, structure, and network relations was far from the dominant view as the world pondered the rise of scientific culture; rather, at the dawn of the Industrial Revolution, science and society had grown to accept a "systems" approach to organizing and arranging knowledge, one that viewed knowledge as neutral non-power laden pieces that could be assembled into a working natural machine. What started in the scientific community spread in the eighteenth and nineteenth centuries to all of society through the Industrial Revolution. Unlike the Scientific Revolution, which transformed ways of thinking about the world but not the lived experience of most people, the Industrial Revolution radically transformed the lives of many people – both the poor and

the elite. The Industrial Revolution offers four defining features (McCellan & Dorn, 1999): (1) New energy sources that fueled industrial development (coal powered smelting of iron; solved timber famine) (2) New organization of labor in the factory system (wage labor, rigid hierarchies of supervisors governing workers, the clock as a management devise) (3) New means of financing industrial development (private banks emerged to fund industrialization) (4) Ideological changes commonly associated with industrialization (the growth of urban areas and a non-agrarian working class, class conflict). The Industrial Revolution represents a shift in economic, social, and political activity, not only in what was produced, but perhaps more importantly, how it was produced.

The mechanization and industrialization common to the period from 1750-1900 changed the face of Europe and some of its colonies. It is difficult to find a segment of this new "modern" life that was not affected by the industrialization. This era brought railroad transportation, steel buildings and ships, affordable and available clothing, the telegraph, electricity, photography and Kodak's camera, sewing machines, Bell's telephones, Edison's carbon-filament lamp, the gas engine, the typewriter, electric power, hydroelectric power, the automobile, radio, and human flight – all before 1900. Unlike the academic advances of the Renaissance and Scientific Revolution, the Industrial Revolution produced effects that were felt by each person in modern countries. Science and technology clearly were at the core of modern life, but the glory of technological living was due a difficult twist.

From the Ashes: A New Problem of Representation

By providing a moderately detailed review of some of the developments following the birth of print media in the Middle Ages to the twentieth century, I am neither suggesting that (1) these conditions were singularly determined by movable type and standard print, nor that (2) these events inextricably led to the Internet, on whose threshold we now stand. I only intend to suggest that the influence of print media was felt in the centuries that follow, and quite necessarily, this comes to play in the story of the Internet's development. A genealogy is the story of a family's history, and a genealogy of representational media should trace the bloodlines of the Internet to its predecessor, the printing press. This connection is described presently.

The political and moral failings that contributed to World War I and II seeded a wide-spread pessimism in some philosophical and creative communities. Many scholars and popular writers became disenchanted with the problems of modernity, particularly the effects of industrialization and technology. For many, the promise of science to bring progress was largely hollow. By the summer of 1945, the world had suffered through its second horrific global war in less than thirty years, culminating in the grim realization of atomic weaponry. It is no wonder that critics such as Adorno, Horkheimer, Ellul, and Marcuse found so much so troubling in the dawning technological condition. How could anyone be optimistic toward technology when so many had suffered at its hands?

The inhumane events of the two great wars were similar to those of the great plague in that both were difficult to explain, caused a tremendous loss of life, and created an atmosphere of regret, despair, and angst. Yet, the atrocities of the great wars were vastly different because they were a deliberate disaster created by humans for humans; whereas the Plague was a random, accidental, biological epidemic. Not surprisingly, the

World Wars' misapplication of technology created a general distrust and pessimism toward technology which was reflected in much of the media from the 1930s-1950s (though one can point to Mary Shelly's (1818) Frankenstein as an early example of a story warning of the problems of industrialization and modernity). Austrian director Fritz Lang's silent film *Metropolis* (1927) is a futuristic science-fiction story set in the year 2026. In Lang's future, residents of a large city state (Metropolis) live in a segregated modern dytopia, one in which the mass of workers toil for the elite of the city, the planners and thinkers who enjoy prosperity and material privilege. Literary works such as Aldous Huxley's *Brave New World* (1932), Ray Bradbury's *Fahrenheit 451* (1953), and George Orwell's *1984* (1948) offered vivid dystopias depicting the dangers of modernization that still capture our attention today. Even fantasy literature contained more subtle, but firm rebukes of man's machines. J.R.R. Tolkien's *The Lord of the Rings* contains strong admonitions against the failings of modernity, technology, and science through his characterization of evil. In Tolkien's tale, the enemies of the human race, the Orc, destroy the natural beauty of Middle Earth in their pursuit of weapon development. Tolkien's friend and fellow fantasy author, C.S. Lewis (1956), also frames his most influential work, *The Chronicles of Narnia*, around a struggle against evil that would subjugate Narnia through a technological industrialization. In the final book of the series, *The Last Battle*, an unlikable, greedy ape named Shift sells his fellow Narnian animals into forced labor. In his explanation to the newly enslaved talking beasts, Shift delivers a cold, paternalistic vision for a new Narnia:

> "There! You see!" said the Ape. "It's all arranged. And all for your own good. We'll be able, with the money you earn, to make Narnia a country worth living in. There'll be oranges and bananas pouring in – and roads and big cities and schools

and offices and whips and muzzles and saddles and cages and prisons – oh everything" (p. 685).

Shift exchanged the animal's freedom for an industrial makeover of Narnia, a type of "progress" for which Lewis held particular disdain. The cantankerous Ape's cruel vision for Narnia's industrial reshaping led to the downfall of this bucolic world, and also served as Lewis' warning against the dangers of modern alienation and mechanization in post-WWII industrial development. If we take the examples shared here as representative of the post-War zeitgeist, then greatly diminished is humanity's faith in itself, the notion of progress, and hope for the future. These were also causalities of the great Wars. Pessimism toward technology and science permeated post-war academic sensibilities, deflating the longstanding optimism toward the sciences, exemplified by Alexander Pope's trope: "Nature and nature's laws lay hid in night; God said, 'Let Newton be,' and all was light."

Given the atrocities that many of these thinkers observed or experienced during this time, they were certainly justified in their moral outrage and provided fitting commentary about the dangers of technology. Yet, the magnitude of suffering that World War I and II introduced to the world overshadowed another problem, much more benign and subtle. While the World Wars stand as enduring illustrations of modernity's failings, these events also accelerated the growth of scientific knowledge in the world. With extensive research being performed by so many across this country and the rest of the world, a rising sea of information grew. Few during this time recognized the challenge of the new tide of information; yet, one commentator, Vannevar Bush, not only recognized the problem, but also anticipated a solution fifty years in the making.

Bush's Problem

Vannevar Bush was the director of the Office of Scientific Research and Development for the United States and was responsible for coordinating the research activities of over 6,000 scientists across the United States during World War II. At the conclusion of WWII, Bush (1945) published a prescient article entitled, "What We May Think" in which Bush gives his answer to the question: what lies next for American scientists? For years, the American scientific community had been solely focused on using science to develop technologies, such as radar, equipment, and weaponry to win the War. The War gave clear priorities and direction to research, and with the War won, many of these scientists would be able to take up a new direction in research. What would be next? Bush's answer is surprising, for he recognized a growing problem in the scientific community was how to manage, or more accurately leverage, the ever-growing body of knowledge:

> But there is increased evidence that we are being bogged down today as specialization extends. The investigator is staggered by the findings and conclusions of thousands of other workers—conclusions which he cannot find time to grasp, much less to remember, as they appear. Yet specialization becomes increasingly necessary for progress, and the effort to bridge between disciplines is correspondingly superficial.

Bush recognized that the next great challenge for science was how to reinvent its intellectual infrastructure. Since the Scientific Revolution, humankind had steadily expanded its understanding of the natural world and cosmos. With each passing century, science improved its methods, scope of research, and results. And while knowledge about the world had rapidly changed since the days of Descartes, our method for storing and organizing the information did not. As Bush (1945) laments:

> Professionally our methods of transmitting and reviewing the results of research are generations old and by now are totally inadequate for their purpose....Mendel's concept of the laws of genetics was lost to the world for a

> generation because his publication did not reach the few who were capable of grasping and extending it; and this sort of catastrophe is undoubtedly being repeated all about us, as truly significant attainments become lost in the mass of the inconsequential...The summation of human experience is being expanded at a prodigious rate, and the means we use for threading through the consequent maze to the momentarily important item is the same as was used in the days of square-rigged ships.

For Bush, the scientific community had to address this troubling bottle neck. World War II had accelerated the pace and direction of research, and galvanized the scientific community into a more cohesive form. Yet, the rapid growth of knowledge production was limited by the lack of infrastructure in knowledge distribution. For almost five-hundred years, humanity had relied on the Gutenberg's movable type and cheap costs of production to distribute knowledge and research through books. But the world had grown immensely since the days of Gutenberg in almost every imaginable way. The world which Gutenberg occupied was far different than the industrialized one Bush experienced. Man's (2002) description of Mainz, Germany – the town in which Gutenberg lived for part of his life – illustrates how different the world was in 1400 A.D.: "... horses vie with cows for street space, pigs and sheep mix with carts and people. The drains are sewage ditches running beside main streets roughly paved with planks: there would be no true paving-stones in Mainz for a century. Alleys are all mud and dung. For a new arrival, it seems chaos" (p. 10). It seems peculiar to read this description of the state of Europe at the time of Gutenberg. So much had changed from Gutenberg's Germany in 1400 to Bush's America of 1945; yet, one thing that remained constant was the means by which humans distributed information. Print media via movable type still dominated the economy of ideas, as it had done for almost five-hundred years. Sure, other media formats had already captured the attention of the public (radio, television,

movies), but print media – in the form of books, newspapers, and journals – still defined academic and scientific discourse in 1945, as they had for hundreds of years. Cheap production of the codex book "tilled" the ground for the Scientific Revolution, and continued to meet the needs of a changing academic landscape for hundreds of years. Over the centuries, the form of presentation of text remained basically idle, while the rate of information expansion and the global capacity to grow ideas steadily grew. The demands of the scientific community taxed this current system of distribution. Apparently, humanity had finally surpassed the capacity of Gutenberg's galaxy (to borrow a phrase from Marshall McLuhan). Put another way, the problem with the book was that it was too successful.

Constructure

The problem the world faced was not simply a technological one; otherwise some innovator would have created better books. Rather, at the heart of Bush's dilemma was a *constructural* problem: print media had difficulty supporting the kind of interactions with knowledge that the scientific community required. What Bush was struggling against was the limitations of periodicals and books to fully support how scientists would need to think and work in the future. The title of his work, "How We May Think," suggests that he recognized a difference between human being's associative approach to thought and the linear organization of print (Bolter, 2001). As Bush writes, "With one item in its grasp, it snaps instantly to the next that is suggested by the *association* of thoughts, in accordance with some intricate *web of trails* carried by the cells of the brain" (*emphasis added*). Bush realized that they were knowledge workers with inadequate tools.

Bush was not the only scholar to lament the inadequacies of modern means of organizing information, nor was he the first. Several years prior to World War II, British science-fiction writer H.G. Wells (1937) expressed a similar frustration with the lag between the production of knowledge and its organization in "World Brain: The Idea of a Permanent World Encyclopaedia." Appealing to an underlying faith and technology, Wells described that though the amount of "knowledge" produced in the world had increased dramatically since the eighteenth century, "contemporary encyclopaedias are still in the coach-and-horses phase of development, rather than in the phase of the automobile and the aeroplane." In Wells' view, "both the assembling and the distribution of knowledge in the world at present are extremely ineffective" and what a civilized world would need was "a new world organ for the collection, indexing, summarizing and release of knowledge..." The similarities between Wells and Bush are striking, but the reason why Wells is a subplot to the story of Vannevar Bush and not the other way around (even though Wells came first) lies in how these intellectuals framed their solutions. For Wells, the production of information overwhelmed current efforts to maintain encyclopedias. His solution was to leverage new microfilm technology to create a "Permanent World Encyclopaedia, so compact in its material form and so gigantic in its scope and possible influence." Because microfilm was small and easily reproduced, copies of Wells' encyclopedia could be housed anywhere and thus maintained by multiple experts around the world. Wells' dreamed of a global index of information, a superstructure of information, one that "few people as yet, outside the world of expert librarians and museum curators and so forth, know how manageable well-ordered facts can be made, however multitudinous, and how swiftly and completely

even the rarest visions and the most recondite matters can be recalled, once they have been put in place in a well-ordered scheme of reference and reproduction." The Permanent World Encylopaedia was an encyclopedia on steroids, large yet nimble. Wells dreamed in the language of his present reality like those who would describe film as pictures in motion (motion picture) or television as cinema on the small screen (McLuhan, 2003). His vision reminds me of similar missteps in technology forecasting, such as the pronouncement in the St. Louis Globe Democrat (1888) about how electricity would be supplied:

> The time is not far distant when we will have wagons driving around with casks and jars of stored electricity, just as we have milk and bread wagons at present. The arrangement will be of such a character that houses can be supplied with enough stored electricity to last twenty-four hours. (Galston, 2004, p. 60).

This newpaper and Wells suffered from similar ailments; neither could describe the future world outside the language of their present context. Wells could not imagine a textual network that broke the mold of topical organization, and it is here where Bush's forecast takes a radical departure. Like Wells, Bush also saw an information network of a global scale; however, the fundamental organizing principle for Bush's system was not the index (a concept familiar to since the Middle Ages), but the what he called *memex*.

Bush's (1945) answer to the problem was to forecast a technology called memex, "a device in which an individual stores all his books, records, and communications, and which is mechanized so that it may be consulted with exceeding speed and flexibility." He argued that by storing information on microfilm, scientists could devise a system in which users could easily look up information by typing queries on a keyboard, and then create a "trail" of information which builds connections between multiple sources of information. Writing in 1945, Bush anticipates the need for what Ted Nelson

(1965/2003) eventually termed as "hypertext," a set of relations between symbols and ideas, one that is more associative than hierarchical. The world of information had become increasingly detailed, comprehensive, and complex, but the means by which humans represented information remained static and unable to fully meet the demands of scientific discovery. Print media could only parrot the interconnected nature of knowledge, and television and radio were built on information templates that were far too reductive (Gitlin, 2002). Bush's call should not be read as one for a particular technology, but for a particular medium with a particular relationship between representation and epistemology. While Wells sought to "store, classify, and index," Bush's solution was to "store, recall, and recombine" (Carr, 1999).

Bush described the need for a new mode of representing knowledge, one not as easily supported in print literature. With advancements in how humans preserve information – from clay tablets, to continuous scrolls, to the codex book – came various epistemological templates. How we record information influences not only what information is preserved, how much, and how it can be accessed, but also how we construct and think about knowledge. As Derry and Williams (1961) describe, "The development of writing has at all times been greatly influenced by the nature of the material available and the means of marking it: even today blackboard and chalk present different problems of calligraphy from those of paper and pen" (p. 216). I prefer to describe the relationship between representation and epistemology as one of *constructure*, a portmanteau combing "construction" and "representation." Constructure can be defined as the influence of representational structure (consisting of both medium type and the informational taxonomy) on the construction of knowledge.

Constructure and Print

Looking back at the story of Gutenberg's development of movable type, we see a number of examples of the varying degrees of constructure. For example, when exploring those factors that influenced the revolutionary success of movable type in Europe, historians generally agree that Europe's alphabetic language systems were instrumental in creating an efficient, scalable model of print reproduction. Because of its technological advantage for printing, the alphabetic form of representation of language created epistemic differences – those that supported new forms of print literature (essays, novels) and diversified the kinds of knowledge that were reproduced. Because it became significantly less expensive to print text, the barrier for particular knowledge to find their way into the public domain lessened. Thus, the differences in pictorial versus alphabetical systems of representation affected the degree of knowledge proliferation. They demonstrate the inexorable link between how we represent and what we represent.

The informational taxonomy of particular media reveal a different dimension of the constructure connection. Movable type allowed for the standardization of texts. No longer was each copy of a text unique in the format and layout of its contents; rather, the printing press made it possible to precisely reproduce a text page-for-page. Consequently, authors and master printers created the *index* to organize a text, something that the irregularities associated with scribal reproduction did not allow (Man, 2002). The index provided a template for structuring knowledge – one that is hierarchical, linear, and well-defined. As Bolter describes, print media's hierarchy is found "in the form of paragraph, sections, and chapters" and can be thought of as "an attempt to impose order on verbal ideas that are always prone to subvert that order" (p. 33). This form of

representation has been the standard-bearer for categorical organization for five-hundred years; however, its limitations have been apparent for some time now. As Poole commented in the nineteenth century, "The fatal defect of every classified arrangement is that nobody understands it except the person who made it and he is often in doubt" (Wheatley, 1878, p. 55)

A Growing Need for Hypertext

What makes Bush's presentation for the need of a hypertext-like system so unique is that he wrote it decades before the Internet could even partially fulfill his vision. Yet, Bush was far from the only voice calling for a different relationship between medium and knowledge. There exists evidence beyond Bush's work that a transformation in humanity's relationship with information was underway for much of the later half of the 20th century. In fact, one can find evidence for hypertext in a variety of sources, both in and outside academics. In 1950, *The New York Times* describes a technology called "Doken," one that is similar to an Internet search engine. Doken was a theoretical machine that could speed read contents of printed text, scanning the entire contents of the Library of Congress in less than ten seconds (O'Donnell, 1998). Ted Nelson and his colleagues began discussing hypertext in the 1960s, far earlier than most users of the Internet likely imagine. But perhaps the most surprising location for hypertext evidence is not in the discussion of academics and technology visionaries but in print literature. Imitating hypertext, fictional works containing examples of discursive, non-linear stories began to emerge with greater frequency in the twentieth century. Julio Cortazar's (1966) novel Hopscotch features 155 short chapters that can be read non-linearly, as do works by Umberto Eco, Milan Kundera and others. For children, a series of books first published

in the late 1970s called *Choose Your Own Adventure* offered young readers open-ended stories in which they are cast as the protagonist of the stories. Readers decide what action a main character should take from a set of choices, and then the story changes based on those decisions. For example, the first book in this long-running series was *The Cave of Time (1979)*. In this book, the reader is cast into the text through the second person:

> You are hiking in Snake Canyon when you find yourself lost in the strange, dimly lit Cave of Time. Gradually you can make out two passageways. One curves downward to the right; the other leads upward to the left. It occurs to you that the one leading down may go to the past and the one leading up may go to the future. Which way will you choose? If you take the left branch, turn to page 20. If you take the right branch, turn to page 61. If you walk outside the cave, turn to page 21. Be careful! In the Cave of Time you might meet up with a hungry Tyrannosaurus Rex, or be lured aboard an alien spaceship!

Thus, a child could read the book many times, but never read the same story twice. In many ways, the child co-authors the story, "no longer a consumer, but producer of the text," an experience in which reading is not merely a referendum (Barthes, 1974, p. 4). A few original thinkers like Barthes and Foucault anticipate the dissolution of the reader/author divide in literature. In a particularly prescient work, Foucault's (1976) *The Archeology of Knowledge* describes the organization and structure of traditional text as hypertextual: "frontiers of a book are never clear-cut," because "it is caught up in a system of references to other books, other texts, other sentences: it is a node within a network..."(p. 23, as cited in Landow (1997)). Landow's use of Foucault gives recognition to the fact that within forms of representation, alternative informational relationships can be supported. Foucault's description of a book as a node in a network is but one example. When we consider Wheatly's conceptual understanding of an index, we may find another. For Wheatly (1878) recognized that the index is not merely a

organizing principle of a book, but "an indicator or pointer out of the position of required information, such as the finger-post on a high road, or the index finger on the human hand" (p. 7). An index and hypertext point to other resources (though they do so in different ways). Wheatly's description could lead to a new definition for hypertext – an in-text index.

The artists creating these works of literature targeted different audiences, but demonstrated the artificiality of the author and the presented text. They may have composed hypertext-like works for a variety of reasons, but in doing so, they also documented the rising attention the academic and literary community gave to decentered, multlinear forms of representation. Undoubtedly, hypertext as a form of representation presents a different relationship with knowledge. As Burbules and Callister (2000) comment, "...hypertext is more than just a new way of influencing existing information; it influences the kinds of information it organizes" (p. 43). However, it would appear that the process is also reversible; that is, new ways of thinking of information and knowledge can precede changes in how we represent it. From the work of Bush to the hypertext-fiction writers of the late 1980s, our world has slowly awoken to the possibilities of another form of representation.

Actors of in the Drama of the Internet's Development

Evidence from the previous section indicates that the "hypertext way of thinking" has been with society since well before the Internet became the ubiquitous system it is today. This shift in how we relate to information may have been brought about by the rapid proliferation of information, at least according to Bush (1945) who states of humankind: "He has built a civilization so complex that he needs to mechanize his

records more fully if he is to push his experiment to its logical conclusion and not merely become bogged down part way there by overtaxing his limited memory." Perhaps the problem with the Gutenberg revolution was that it was too successful. By the mid-twentieth century, Bush and others felt overwhelmed by the vast informational resources published in print each year, and this created an anxious need for another revolutionary step in representation. Humans needed to adapt to a new informational environment, just as they had done in the Middle Ages.

This leads to a final question for this chapter: what factors necessitated the development of the Internet? (This is different than asking which factors necessitated the *invention* of the Internet.) There is no simple formula for explaining technological development, as illustrated by the extended case found in Gutenberg's metal movable type printing press. The Middle Ages were a divided age – a time period that offered contradictory influences on innovation. In many ways, the Middle Ages were well-suited for the development of movable type. The technological foundation for this innovation were already firmly in place – screw-based presses, metal punches, alphabetic writing systems, and so forth. But as the Gutenberg example demonstrates, sole technical readiness is not the only requirement for a revolution in representation. The Middle Ages were a time of representational crisis, in which the demands for a better form of knowledge distribution than hand-copied books was mounting. Europe was finally emerging from the challenges that beset the continent after the fall of the Roman Empire, and was posed to advance their understanding of the world through a renewed commitment to the sciences and the exploration of the world through the seas. With the birth and development of the university, needs of the Roman Catholic Church for

standard print resources, and basic caloric needs being met after the European Agricultural Revolution from 1000-1500 A.D., one might very well expect the development of the printing press. Yet, just prior to Gutenberg's press in 1455, Europe's printed books would have fit in a single wagon from that era (Man, 2002).

There seemed to be a market for printing, the need for printing, and the opportunity for printing; yet, as I argued in the Chapter 2, medieval Europe was a curious atmosphere for innovation. For most Europeans, the Agricultural Revolution that began around 1000 was quite conservative in its social effects. The heavy plow and other agricultural technologies reinforced the stratified feudal society, ensuring that the majority of the European population remained in the peasantry. Though the Middle Ages marked the development of seminaries and universities, a great majority of people of Europe remained illiterate. Also, European society of the Middle Ages was still a largely non-scientific culture. Mythic and mystic paradigms were prevalent, and the Church exerted enormous influence on matters of science and state. Fear gripped the Europeans of the fourteenth and fifteenth century due to the mysterious movement of the Black Plague. Such strife makes medieval Europe a curious ground for innovation.

These same patterns are visible in the rise of the Internet. Like its predecessor movable type, the Internet could not have been created unless humans had already developed the necessary technical foundation by manipulating silicon to make processors, developed the personal computer, and connected the world through phone lines. Often, "official" histories of the Internet are little more than the history of technical innovation in networking technology from the 1960s to the 1990s. Yet,

technological readiness alone is not the sole force behind the development of this technology.

As in Gutenberg's time, 20th century humanity was struggling with a significant gap between knowledge and representation, a *constructural gap*. The 20th century can be characterized as one of immense change to the political, social, economic and cultural landscape of our world. It has seen radical political transformation, sweeping social movements, world wars, and now more recently, globalization. Writing at the end of the century, Peter Drucker (1994) aptly captures the immense torrent of change as a force that affects "work and work force, society and polity, are all, in the last decade of this century, *qualitatively* and *quantitatively* different not only from what they were in the first years of this century but also form what has existed at any other time in history..." (*emphasis in original*, p. 53). Due to the new-found economic, political, social, and informational complexities, it is not surprising that a new relationship with knowledge by way of a qualitative change in representation occurred.

So, one of the catalysts for the development of the printing press and the Internet is the significant gap between new knowledge needs and the representational sensibilities of the codex book. It is a *constructural gap*. Constructure is an important qualifier to this gap because it reminds us not to confuse a new method of representing knowledge as only a new distribution system. In other words, the printing press did not merely automate the jobs of the scribes, making the job of print reproduction easier but leaving society unaffected. Rather, the act of mechanizing printing gave rise to new forms of organizing information, such as the index, which in turn imposed a more hierarchical understanding of knowledge for humanity. The Internet embodies a new stage in

representation not only because it makes information digital, but also that it allows for a knowledge taxonomy that is far different from previous representational media.

The Internet is a form of knowledge network that resists the imperative of a single taxonomy such as the index; rather, the web favors a multiplicity of organizational information schema, some of which are unique to the medium. For example, folksonomy represents the small efforts of many to add organization to knowledge on the Internet. Unlike the taxonomy of an index, which is author centered and is necessarily centralized, folksonomy is supported by many users "who are encouraged to assign freely chosen keywords, typically referred to as 'tags,' to pieces of information or data..." (Wikipedia, 2006). Folksonomy is an open-source taxonomy, the reader's taxonomy, the anti-taxonomy. In the atmosphere of the Scientific Revolution and the modern era, only the experts, the academic elite, could impose order on knowledge. It was the scientists and researchers who categorized and classified. How ironic that in the most important knowledge network in the world's history, such standards are left open.

The popularity of folksonomy demonstrates that the index is an invented form of categorizing knowledge that should not be considered as inevitable, irreplaceable, or prestigious. Taxonomical characteristics are often particular to media, and influence how we interact with the knowledge and information contained in the media. Thus, these characteristics are an important component of *constructure*.

Other Factors of Development for the Internet

Both the printing press and the Internet embody changes in the relationship between knowledge and representation, and redefined the epistemic possibilities. These technologies arose at a time in which the gap between humanity's knowledge needs and

its current form of representation was widening. But like the printing press, the drama of the Internet's development involves forces beyond those involving knowledge and representation. The Internet did not burst upon a barren world, but rather a complex ecology of political, economic, social, technological "scapes." Appadurai (1993) defines *scapes* as "dimensions of global cultural flow," each being fluid, irregular, and intertwined. Examples offered by Appadurai include the *ethnoscape* (landscape of people), *technoscape* (global technology), *finanscape* (global capital), *mediascape* (distribution of media), and *ideoscape* (distribution of ideology). It is through these planes that Appadurai understands the complex social, political, and economic interactions of a globalized world. For Appadurai, global flows occur "in and through the growing disjunctures" between these *scapes* (p. 224). Such a framework is useful to understand the development of global phenomenon including the Internet. Building on Appadurai, I will conclude this chapter by exploring the influence of the *fiananscape*, or financial landscape, and what I call *politicoscape*, or political landscape. I begin with former.

In many ways, the rapid expansion of the Internet has been fueled by the interests and activities of the market. From the mid-1990s to the turn of the century, the economic enthusiasm toward the Internet was unmatched. "During the dramatic Internet-driven boom of the 1990s, Silicon Valley was described as the home of 'the greatest-ever legal creation of wealth in the history of the world,'" writes Benner (2004, p. 174). Though this enthusiasm would fade once the dot-com "bubble" burst in 2001, the Internet's growth is certainly accelerated by its use by businesses around the world. Recent statistics support this conclusion. In a recent U.S. Census Bureau report, we are told that

almost a trillion dollars of manufacturing shipments in 2004 were initiated on the Internet; the Internet sales of U.S merchant wholesalers massed to over 800 billion dollars; and U.S. retail sales on the Internet were over 70 billion dollars in 2004 ("U.S. Census Bureau Estats", 2006). Some early studies have also found that the Internet has increased "business productivity" through the reduction of transaction costs, increased management efficiency, and increased competition from price transparency and broadening markets for buyers and sellers take on productivity (Litan & Rivlin, 2001). It should be noted that some economists have tempered such proclamations by arguing that the world's economic geography may be influenced by the Internet, but not revolutionized by it (Leamer & Storper, 2001). Van Alstyne and Buckley (2004) recount that while productivity stagnated throughout the 1980s and early 1990s, it soared after the rise of the Internet, from 1993-2003. What recent economic studies reveal is that while corporations did not call for the creation of a new global network for economic activity like some in the scientific community did (Bush, Nelson, and others), the market mobbed the Internet once it became publicly visible in the early 1990s. And as this chapter is interested in technological *development* versus technological *invention*, origins do not tell the whole story anyway. Since the release of Mosaic Web browser in 1994, the Internet's economic importance has rapidly increased ("U.S. Census Bureau Estats", 2006). And like the printing press, the Internet found a comfortable market in its early years. There is little indication that this will change in the near future.

National governments, the principle members of the *politicoscape*, have been particularly influential in shaping what the development of the Internet. In their recent book *Who Controls the Internet?*, Tim Wu and Jack Goldsmith (2006) argue for the

realization of a "bordered" Internet. The Internet has often been lauded as a decentralized, libertarian paradise which would eventually undermine the heavy hand of national governments, the "weary giants of flesh and steel" (Barlow, 1996). Armed with recent examples of China's domestication of Google and France's humbling of Yahoo, Goldsmith and Wu argue that because users of the Internet have a physical address in addition to their IP address, governments have little trouble exacting control over Internet. What is surprising about Goldsmith and Wu's claims is not that the Internet is bordered, but that the two law professors see advantage in this development. Goldsmith and Wu argue that the Net should not be governed by one rule of law. As in the Yahoo case, the French see a Nazi auction site as indefensible, while Americans view it as free-speech. Neither proud nation will acquiesce to the other; however, recent Internet technologies that filter content by geographic region allow for many national Internets as opposed to one global Internet. For Wu and Goldsmith, it would appear that because of a bordered Internet, more people can have *their* Net and surf it too.

The take-away point for this chapter is the ample evidence that Goldsmith and Wu provide of a legislatable Internet erodes the commonly accepted position of Rheinhold (2003), Reynolds (2006) and others who suggest that the Internet is still very much a network beyond the reach of government. It may be that as the Internet continues to mature, the extent of governmental control on the Internet increases. A forthcoming study produced by the free-Internet advocacy group OpenNet Initative (ONI) details the sophistication with which countries like Egypt, Syria, Tunisia, Iran, Vietnam, Saudi Arabia, Kyrgyzstan, Belarus, and censorship pioneer China restrict access to the Internet. Techniques may range from the overt restriction of political and religious websites to

cloak-and-dagger subterfuge in which governments sponsor "denial of service" attacks on opposition party websites or replace "page blocked" with "page not found" warnings to trick their citizens into believing that they are not being filtered or monitored in their usage (M. Anderson, 2006). It is hard to imagine the virtue in this, but such hegemony only confirms the enormous influence of governments in virtual spaces.

For some, governmental influence on the development of the Internet can be seen most explicitly in early predecessors of the Internet, such as the United States' Defense Advanced Research Projects Agency's "ARPAnet," the first packet-switching network. Designed during the height of the Cold War in the 1960s, some historians of the Internet argue that ARPAnet's creation reflected the desire of the United States government for a decentralized communication network that could withstand nuclear attack (Hafner & Lyon, 1996; Poole, Schuyler, Senft, & Moschovitis, 1999; Sherman, 2003). Researchers at the RAND Institute and DARPA recognized the problem with centralized military "command and control" centers to coordinate national defense and nuclear arsenals is that if eliminated, the national defense systems will be made inoperable. This created a troubling incentive for cold war to escalate into hot war. The nation willing to strike first in a nuclear war could eliminate its adversary's potential for retaliation with its initial strike. This scenario – one that was certainly hung over military and political officials in the United States and the Soviet Union – gave rise to what one RAND researcher described as "a dangerous temptation for either party to misunderstand the actions of the other and fire first" (Hafner & Lyon, 1996, p. 55). Ironically, it was argued that the best way to ensure peace would be to enhance military preparedness by decentralizing control over national weapon systems across a broad, robust network of computers. Thus, many

who have written about the history of the Internet have concluded that the Internet grew out of such a need.

However intuitive this narrative about the relationship between the Internet and Cold War governments may be, there are many Internet insiders who challenge the notion that the Internet was developed as a fail-safe network in a nuclear world. Those often attributed for many of the early technical achievements making the Internet possible, including Bob Kahn, Bob Taylor, David Clark, and others, have contested the relationship between their work and the military motivation for a decentralized electronic network. In their account "A Brief History of the Internet," a large collection of Internet pioneers noted:

> It was from the RAND study that the false rumor started claiming that the ARPANET was somehow related to building a network resistant to nuclear war. This was never true of the ARPANET, only the unrelated RAND study on secure voice considered nuclear war. However, the later work on Internetting did emphasize robustness and survivability, including the capability to withstand losses of large portions of the underlying networks. (Leiner et al., 2003)

When asked in an interview about the relationship of the Internet to nuclear war, Internet pioneer Vinton Cerf also remarked, "The first project that ARPA funded in wide area computer networking was the ARPANET. It was often mistakenly given this attribute of nuclear resilience. The fact is it was designed for resource sharing; it was really to solve a problem that ARPA had when it was supporting computer science research" (NEWs.com). Perhaps as we look at the development of the Internet in the context of the Cold War, we cannot resist making the Internet a solution to a military problem. This activity may be best described through the language of narrative psychologists – that of Bruner's (1991) "coherence by contemporaneity." However, tenuous the conceptualization of the Internet as a fail-safe information network in a

nuclear age may be, Cerf's words do reveal the desire of the government to form a robust network for resource sharing, if only to make computer scientists more effective. If this is the case, then the government has been involved in shaping the development of the Internet – Cold War or no Cold War.

Ambiactivity Revisited

Chapters 2 and 3 combine to offer a complicated story of technological development through the examples of the printing press and the Internet. Gutenberg's press offers an opportunity to explore the forces influencing the development of a revolution in representation and the effects of this technology of the word on human life. At this stage, the Internet only allows a discussion of the early forces of development and its immediate effects. Both accounts, though separated by almost five-hundred years, serve as examples of a non-linear conceptualization of the network of forces involved in development – what I termed in Chapter 2 as "*ambiactional*," or relations encircling, encompassing, and environing elements. *Ambiactivity* is a reaction against the visualization of influence vectors, one-directional, fixed, forces of influence on technology. Such thinking often leads to technological determinism, the idea that a technology is the inevitable result of certain causal forces and through the logic of the market, the best technology prevails. For example, common knowledge suggests that consumers of nineteenth century America needed a more robust transportation system, which necessitated the development of the automobile. Use of the automobile in turn impacted human life in significant ways. Many scholars have recognized the hollow promise of technological determinism. "There is no natural law that the best standard shall win – QWERTY, Lotus 123, DOS, and VHS are often cited as examples in this

context," writes Bowker and Leigh-Star (1999), "The standards that do win may do so for a variety of other reasons; they build on an installed base, they had better marketing at the outset, or they were used by a community of gatekeepers who favored their use" (p. 14).

Even if the trap of determinism is side-stepped, the linear conceptualization of technological invention and development, which so heavily emphasizes vectors of influence, is bound to several problems. Influence as vectors implies a geometry of relationship in the form of *A–B // B–A* and with it, a symmetry of influence, chronology of impact, and a host of other incompatible characteristics for exploring technological development. Drawing back on the familiar example of the development of the automobile, the would be: *[past] human needs–cars // cars–human needs [future].*

If understood properly, *ambiactivity* changes the nature of the conversation of technology in three ways. First, it shifts the locus of attention of a technology from one of invention to development. If forces affecting technological development are more like orbs of influence than vectors, then it only makes sense that the influence of those forces do not immediately disappear or drastically diminish upon the moment of invention. Second, forces of influence are temporal, meaning their existence and impact are not eternal. What may drive a technology into existence is not necessarily the same set of forces that maintain it, shape it, or discard it. These first two attributes necessitate the third characteristic of *ambiactivity*, one that situates technological development in a complex matrix of environing forces, impersonal, and yet, persistent.

Looking at the example of the printing press, there were a range of influences that were instrumental to its birth, particularly religious, political, economic, and constructural. These forces, as overlapping *scapes*, did not simply stop interacting

together the moment Gutenberg finalized his metal-based, movable-type printing press. Rather, they continued to push and pull with the technology as it developed from a single press in a small European town to a form of *media* with global impact. Like Foucault's sense of power, these *ambiactive* forces are impersonal, dispersed, outside the control of individuals, and omnipresent. They lack constancy and uniformity. Church, state, and science did not conspire together to create a new medium of information that could further the hierarchization of society; rather, through their use of print, the meaning of print media was defined. At some levels, the development of print media did extend categorical thinking, making even the human being a point of data in scientific study. At others, it reduced thick religious bureaucracy to the eventual priesthood of believers. In the process, print media was instrumental in the reconfiguration of not only the political landscape of Europe, but also the relationship between Church and State. The orbs of influence work on and through a technology, each other, and themselves.

In the Internet's case, *ambiactional* forces are even more environing than in the case of print media. The sphere of commerce affects the Internet's growth, moving it in one dirction, but at the same time, we find other *scapes* such as the *politicoscape* that push back against the free-commerce of the Internet, as in the France versus Yahoo case. The result of these orbs of influence is a confused, but dynamic entity in the Internet. And this says nothing about the influence of the people that use it the most, the *ethnoscape*. A divided Internet, one that offers a range of applications from ecommerce to edemocracy, is the result of the interaction effects of these *scapes*. Just as the printing press began as a technical accomplishment and grew into a new medium, the print medium, the Internet also follows a similar path, beginning as an experiment in

engineering and now taking shape as hypermedia. The key to understanding such developments lie in the collection of forces that shape them. These matrix of forces are explored in more detail in the next chapter, which explores power relationships on the Internet.

CHAPTER 4
THE DISCIPLINE OF KNOWLEDGE ON THE NET

Any sufficiently advanced technology is indistinguishable from magic.
Arthur C. Clarke

Any technology that is distinguishable from magic is not sufficiently advanced.
Gregory Benford

Throughout human history, it would seem that the activity of search has played an important role. History books tell us of hunter-gathers, nomadic peoples, the age of exploration, and the space race. We know the names of explorers, astronauts, sea captains, and adventurers. The motivation for searching may have ranged between the religious, the social, the economic, and even curiosity (It was reported that when a local Indian official asked Vasco da Gama why he had traveled so far to come to India, the Portuguese explorer replied, "Christians and spices"). While the motivations may vary and its prominence is certainly not constant, the activity search has been an element of importance for many human societies.

We find that the activity of search has assumed a prominent role in the cultural landscape once again. Rather than searching the open seas for what lies beyond the horizon's edge, we search the sea of information that is the Internet. Not since the days of an unmapped world and undiscovered continents have human beings been so involved in searching and exploring an unfamiliar space. Once again, the human species finds itself in the midst of a story of exploration, discovery, and global convergence. How prominent has the search for relevant information become? Piper Jaffray estimates that in 2003 the world conducted 550 million Internet searches *daily*, with a growth rate of 10 to 20 percent per year (Battelle, 2005). More recently, Nielsen//NetRatings reported that in 2005 over 55 billion Internet searches were conducted *in the United States alone*

(Bausch & Fan, 2006). While staggering, these numbers represent a small fraction of the possible growth in the Internet search market. As of March of 2006, approximately 16% of the world's population has Internet access (Stats, 2006). As more of the world's information finds its way into online spaces and penetration of the Internet increases, the centrality of the search as a regular activity of a knowledge society is a near certainty. Clearly, such an activity is an important one and deserves the attention of the academic community.

This chapter examines the nature of the search on the Internet in three parts. First, I explore the pressing need for search on the Internet. The Internet is the largest information network in human history, and its size (not to mention rate of expansion) requires search as a primary vehicle for locating unfamiliar information. Second, I describe some of the unique problems in designing an effective search tool for the Web. As an unbounded, vast information network, the Internet poses many challenges to effective searching through its size, document diversity, and rate of change. And third, I explore the important philosophical and sociological implications of a knowledge network driven by search. This will include a discussion of the two most popular conceptualizations of power relations on the Internet, the utopian-egalitarian perspective and structural perspective. I then will offer a different account, a critical poststructural perspective.

In this last section, I employ several Foucaultian ideas to describe the relationship among Google, the information of the Internet, and its users. Foucault saw knowledge not as universal or fixed, but as textual, situated, and culturally constructed. His philosophical writings position truth as a product of knowledge and power in a circuit of

exchange. I will examine the role the search engine may play in such a knowledge circuit, but before this can happen, the necessary groundwork must be laid. I begin then by asking: why is search so important to the Internet?

The Need for Search

The Internet is a system that is exceedingly efficient at providing a platform for ideas. Some estimate that in 2003 the Web contained over 167 terabytes of publicly accessible information, with another 66,000-91,000 terabytes in information stored in web-based databases. To put this in perspective, the print collections of the United States Library of Congress consist of 10 terabytes ("How much information? 2003", 2003). To be sure, the Internet is large, and it is growing at a staggering rate due to its two basic properties – decentralized design and open standards. For the most part, there are very few barriers to publishing information on the Web. The Internet lacks conventional gatekeepers and hierarchical control common to other forms of publication. Properly, many celebrate the Internet as the archetype for diffuse networking, a crowning example of a public good (Rheingold, 2003; Trippi, 2004). However, such a prolific growth of data from open publication has lead to a unique set of problems for Internet users. The problem with so much information from so many sources is that without some sort of formal organization, it can become increasingly difficult to connect the curious with the answers they seek. Information and attention have a curious relationship. "What information consumes," wrote Herbert Simon (1971), "is rather obvious: it consumes the attention of its recipients. Hence a wealth of information creates a poverty of attention, and a need to allocate that attention efficiently among the overabundance of information sources that might consume it" (p. 40-41).

Early adopters of the Web were continually frustrated with navigating the depth and breadth of the Internet. With so many offerings, how does one find the information she seeks? In those days, surfing the Web was similar to leafing through the pieces of a jigsaw puzzle, searching for that corner piece that always seems to elude you. These early years revealed a hidden paradox to decentralized, open networks: their capacity for individual publication and idea propagation was seemingly limitless, but such networks resist the necessary organization and structuring to make their navigation manageable. This is the paradox of decentralized networks. What good is endless data, if consumers of information cannot find what they seek? As Burbules & Callister (2000) describe, the Internet can be viewed as "the opportunity of having information from millions of sources and points of view, and the problem of having information from millions of sources and points of view" (p. 71). Put another way, the problem with a burgeoning Internet is *relevance* of information. Relevance is the limiting reagent of the Internet. Only when information is situated in a meaningful context can it become useful in improving human understanding. As Melody (1990) has indicated, "We would be hard put to demonstrate that the quantum leap in communication technologies, and the vast increase in communication and information transfer that now takes place using these technologies, have led to an increased understanding of human and social affairs..." (p. 28). A vast sea of information like the Internet does not necessary yield a considerable increase in knowledge. The early days of the Internet typified this point.

Early Navigation on a New Kind of Network

A network of the magnitude, scale, and nature of the Internet had never existed; consequently, finding an answer to the paradox of decentralization would not be easy.

Such a new and novel space invited the opportunity for innovation in navigation, yet early attempts to provide assistance to Web surfers in their daily online activities often mirrored organizational systems common to print media and other bounded systems. Yahoo, a prevalent Internet portal and search engine, began as a directory of links published by two Stanford graduate students procrastinating on their dissertations. Traditional publication houses offered Internet directories – a "yellow-pages" for the information age that would organize the best websites by category. Such efforts were met with mixed success as they often failed to meet the demands of a new medium. The primary problem for both Yahoo's human edited categories of links or Internet yellow-pages was one of scale. Using humans to categorize an exploding galaxy of text, images, and sounds was admirable, but doomed to obsolescence.

The second obstacle in such endeavors was the diverse needs of those that surf the Web. It was particularly difficult for printed directories of links to classify sites in such a way to meet the needs of teenage gamers, antique collectors, school teachers, and political pundits. The more the Internet grew, the wider the range of users' needs and expectations. An open system would require a more robust navigation solution, one that could scale with the system, meet the demands of a population that ranged widely in age, interest, occupation, and nationality, and do so at a click of a button. "Search" was about to experience its own renaissance. The problem of endless data would require a solution that can adapt to the ever changing landscape of the Internet. In short, we learned that decentralized networks needed a tool to search them, and with that seemingly obvious revelation, the search engine wars began.

The Origins of Search

The idea of searching digital archives was not original to the Internet. Computer databases, information warehouses, and even consumer operating systems offered search capabilities. The difference between early search tools, and the Internet search engine was the nature of the domain they searched. Predecessors of Internet search engines had the advantage of searching bounded networks. With limits to the amount and type of information, developing an effective search algorithm is a manageable task. Whether key word searches, categorical searches, or hard-coded searches, bounded data could easily be mapped by software. Early library databases are a good example: they are simple, targeted, and effective. But as a field of information, the Internet is effectively boundless, and its data is as complex as it is diverse. This was (and still is) a serious difficulty. Lacking very few natural constraints, the Internet is a frontier without knowable borders whose most significant limitation to growth is its users' imagination. Before they ever launched their now infamous company Google, Stanford graduate students Larry Page and Sergey Brin (1997) commented on this challenge in one of their academic papers:

> The web is a vast collection of completely uncontrolled heterogeneous documents. Documents on the web have extreme variation internal to the documents, and also in the external meta information that might be available. For example, documents differ internally in their language (both human and programming), vocabulary (email addresses, links, zip codes, phone numbers, product numbers), type or format (text, HTML, PDF, images, sounds), and may even be machine generated (log files or output from a database) (p. 7).

With the rise of web-based publishing tools common to "Web 2.0" technologies, anyone can create a variety of web-based content – pages, blogs, photo galleries, RSS feeds, podcasts, video archives – with minimal technical competence. Consequently, the

Internet has evolved from a small collection of academic papers in the early 1990s to an ill-structured collection of digital media of immense proportions – one that can be best characterized by its irregularity and lack of continuity. Searching the ever-shifting data of the Internet would require more than a traditional software engineering mindset, which may be why some of the most talented minds have been drawn to solving the problem of the Internet search.

The Challenges of Search

While there were a multitude of companies competing in the race to become *the* search engine for Internet users around the world, they all faced the same four design challenges:

- Indexing a discursive network:

  How does your engine determine what information is on the Internet? As a vast decentralized network, just knowing what information is available is challenging. Effective solutions would require adept algorithms to troll the Internet, as well as flexible, scalable, and efficient indices (databases) to store information on each page in the search engine's database. Early search engines significantly lacked in the breadth of their indexing efforts, with more than much of the Internet remaining dark (outside any index).

- Developing a standard for relevance:

  As illustrated by Melody's comments, information lacks value without a meaningful context, and contextuality is a localized phenomenon. Relevance is different for each query; consequently, effective search engines had to develop dynamic means of determining relevance. Consequently, engineers

had to develop quantitative variables that would compensate for users' qualitative sensibilities. Such decisions are value-laden and are the focus of much of this chapter.

- Bridging the human-machine language barrier:

  Related to the problem of relevance, perhaps the most difficult challenge facing developers is determining how they would connect users to the information they seek. An effective search engine must allow users to frame queries in language similar to their everyday conversations and still connect them with the data they seek. As Batelle (2005) comments in his history of search engines, "In a similar vein, engines must deal with local variances and the problem of a lack of controlled vocabulary. Nearly all programming languages employ a very strict grammar in order to communicate between humans and machines. If one comma is out of place or one word misspelled, the program will fail. Search can't afford such strictures..." (p.23-24). This requires far more than providing a comfortable, easy-to-use interface. Designers must determine how search engines should interpret user queries in order to deliver the desirable results. This complicated process, often referred to as inference, requires software to do more than merely store keywords from a web page; rather, it must know what the page means. But how can software read?

- Keeping pace with the constant change afforded by decentralization:

  Decentralization allows the Internet to adapt to its users needs, on-demand. As a medium, the Internet is continually in flux. In trying to track and index

data, how does a search utility manage change? With little object permanence, how would software keep users from searching an Internet that no longer exists or from missing out on the newest developments on the Internet?

These four challenges should have been enough to deter most from ever attempting to solve the problems of the Internet search. However, we must remember that the economic atmosphere of the 1990s in the United States was one of irrational exuberance toward technology. The great "Internet bubble" grew daily, and venture capitalists happily poured millions of dollars into this new business market on the hope that they would get in early on the next Microsoft-type success. Through Silicon Valley and dot com fever, it would appear that California was experiencing its second gold rush. Dozens of companies invested significant dollars into developing on-line search tools that would adequately address the four basic design challenges of the Internet search. For quite some time (at least by Internet standards) no clear market leader emerged. In many ways, the anatomy of early Internet search engines developed by companies such as Altavista, Excite, Hotbot, WebCrawler, and Lycos were all quite similar to each other and varied little from models of search utilities developed from much smaller databases in the 1970s.

The Anatomy of Search

Most search engines, even those popular today, consist of three components: the crawler, the index, and the interface software. A search engine web crawler's main purpose is to determine what information exists in the shifting-sands of the Internet. The Internet is dynamic through its rate of expansion and the rate in which its content changes

– links move, pages change, websites are deleted throughout the world, day and night. As the Internet morphs, crawlers must continually update the information they collect, much like an artist who paints a subject who is always shifting positions and poses. The name "crawler," which implies a slow, arduous process is rather misleading: these programs process a tremendous amount of information very rapidly, though given the depth and breadth of the Internet, the process may seem slow. Early versions of Google's crawler ran up to 4 crawl processes at once, crawling over 100 web pages per second (Brin & Page, 1997). Certainly, more recent crawlers offer more processes and faster scanning.

Crawlers return the information they find to the search engine's giant database, called the *index*. The index contains information about the page contents (key words, page names, URLs) and also metadata about the page (how often it's updated, the links it offers) (Battelle, 2005). Where search engines often differ is how they analyze the data found in their index. What factors do search engines consider important to determine the relevancy of the information in the index? This task is resolved by the *interface software* which translates the user's query into results by running it against the index through its particular relevancy algorithm. While the quality of search results are driven by these three components: the depth of the index, the frequency of updates, and the fidelity between what a user's intended results and what the search engine actually returns (the realized results), it is likely that the search engines differ most in how they analyze their indices. This is the front-line of the search engine wars, and where two unassuming graduate students turned the Internet world upside down.

Along Came Google

While early search engines captured an audience, it certainly was not because of the quality of the search tools or the commitment of those that made them. Though some individuals, such as those behind the 1990s search-leader Altavista, were enraptured by the problem of the Internet search, other saw search as competing with the dominant business model of the day: the Internet portal. Internet portals are the equivalent to the large, retail supermarkets – you can find everything there: weather reports, games, shopping, web links, chat groups, and even search. Some companies wondered if an excellent search tool might hurt their status as a portal; after all, if users found what they needed on a search tool, wouldn't they leave the portal all together (Battelle, 2005)? One web portal CEO is reported to have commented that, "As long as we're 80 percent as good as our competitors, that's good enough. Our users really don't care about search" (Google.com, 2006a). Given the economic opportunity associated with today's search companies and popularity of Internet searching, it is hard to believe that the business-side of search was ever questioned. This confused and mediocre landscape of the Internet search was radically transformed when two unknown graduates from Stanford University, Larry Page and Sergey Brin (1997), described in one of their first academic papers ("The Anatomy of a Large-Scaled Hypertextual Web Search Engine") that the problem with the search engines of the 1990s was in the quality of their results:

> In 1994, some people believed that a complete search index would make it possible to find anything easily. According to Best of the Web 1994 -- Navigators, 'The best navigation service should make it easy to find almost anything on the Web (once all the data is entered).' However, the Web of 1997 is quite different. Anyone who has used a search engine recently, can readily testify that the completeness of the index is not the only factor in the quality of search results. 'Junk results' often wash out any results that a user is interested in. In fact, as of November 1997, only one of the top four commercial search engines finds itself (returns its own search page in response to its name in the top ten results). (p.3)

Search engines of the 1990s based their algorithms primarily on page key words, word frequency, and other metrics easily manipulated by spammers who desire to push more traffic to their websites. Given the economic value of the top spots in the top search engines, spammers and search engine optimization consultants employed a variety of methods to fool search engines in inflating the index rank of their sites (or their clients' sites). Early search engines' indices suffered enormously from those that would attempt to tie innocuous queries, such as cars, with unrelated sites (most often pornography) (Battelle, 2005). It is understandable that Brin and Page (1997) felt that the limiting factor to most search engines was their precision. They understood that while the Internet was growing faster than most had imagined, users needed search engines that placed relevant websites in the top ten results of a search engine query:

> One of the main causes of this problem is that the number of documents in the indices has been increasing by many orders of magnitude, but the user's ability to look at documents has not. People are still only willing to look at the first few tens of results. Because of this, as the collection size grows, we need tools that have very high precision (number of relevant documents returned, say in the top tens of results). (Brin & Page, 1997, p. 3)

Their solution was a search algorithm which took into consideration the "link structure" of the Internet as the main mechanism for determining quality of information. The novelty of Page and Brin's approach was that it would lean heavily on hyperlinks between websites in addition to page contents through establish its rank of relevance. Theirs was the first search engine to consider the hyperlinking "architecture" of the Web as part of the solution to search. They named their new search tool Google, based on the mathematical term "Googol," which is a very large number (1 followed by 100 zeros).

Origins of Google

The Google project originally began with a different name and purpose. Larry Page, in search for a compelling doctoral thesis, worked on developing a piece of software he named "BackRub," which set out to solve one of the fundamental flaws in the World Wide Web's version of hypertext: while hypertext makes it easy to link to any page on the Web, it was difficult to determine what pages linked to a site. Page's purpose in creating BackRub was to answer the question of who was linking to whom. Always ambitious, Page sought to apply BackRub to the entire Web, but to do so would require BackRub to crawl the entire Web. Such a task would require considerably complicated mathematics, and when Page needed help parsing the variables, he turned to fellow student Sergey Brin. Brin was a gifted mathematician at Stanford who struggled to find a single idea to apply his genius against. He knew Page and when he heard about the BackRub project, he eagerly joined the research group. Page and Brin wanted to provide web page developers not only a list of who was linked to them, but also the relative ranking of those links (Battelle, 2005). This crucial addition is what gave impetus to the most famous ranking algorithm in the world.

The two students developed a ranking system called PageRank that took advantage of the "democratic" nature of the Web. Through the open architecture of the Internet, any site is free to link to any other, and in doing so, is casting a "vote" for that site as a place one may want to visit. Page and Brin theorized that the more links to a site, the better its quality. This presumption formed the core of their PageRank technology, which calculated the number of links coming into a given site. PageRank also determined the importance of a link to a site by weighting its value by the number of pages that link to it. Thus, a link from a popular portal like Yahoo.com would be worth

more than a link from some obscure blog. Mathematically, the Page and Brin (1997) expressed these relationships in the following algorithm:

$$PR(A) = (1-d) + d(PR(T1)/C(T1) + \ldots + PR(Tn)/C(Tn))$$

Where $PR(A)$ = gives the Page Rank (PR) of a given page, A
D is a damping factor (originally set to 0.85),
$T1 \ldots TN$ are the pages linking to page A
C is the number of outbound links found on a page linking to A

While this formula seems intimidating, it is worth exploring its construction under the auspices of understanding Google more completely. In PageRank's original form, the rank of a page *A* is the sum of the PageRank of those pages linked to it (*T1, T2, T3 ....TN)*. However, the amount of donated PageRank pages *T1 through TN* is first divided by the number of outbound links on those pages. This value is then multiplied by Page and Brin's damping factor, *d* which represents the likelihood that a user, if given the link, may not follow it. Thus, the damping factor is a probability which reduces the amount of PageRank a site can contribute. In its original form, damping occurred in the PageRank algorithm at 85%. Rewriting the formula in words, it reads:

According to Google, the Relevancy of Page A = 0.15 + 85% of the total rank of those pages linked to A divided by the total number of their outbound links

Some readers may wonder, why bother with exploring the technical footnotes of the Google story? My answer is a simple one: I believe Google to be one of the most influential players in the new knowledge economy, and, unlike many corporations, Google gave a glimpse into one of its seminal business secrets. Of course, at the time that Brin and Page (1997) published "The Anatomy of a Large-Scale Web Search Engine" they could not have known that eight years later they would have successively grown Google into one of the most influential and profitable companies in the technology sector. It is the market success of Google that makes their academic paper so insightful.

Still unsure of leaving the academic world to launch a risky startup in a market saturated with search engines, Page and Brin tried to license their search protocol to established search companies – Yahoo, Excite, Infoseek, etc. (Battelle, 2005). However, no company took the young engineers up on their offer, which eventually led both to quit school and start a company, *Google, Inc.* It would be Google, Inc. who would rise to the challenge of connecting users with relevant information, and with it, raise a number of questions about the valuation of knowledge on the net.

Google's Market Success

Google's rapid rise beyond success to market monopolization grew from the quality of searches produced by its PageRank technology. Rather than relying on merely the page content of websites (a common practice with Internet search technologies), Google looked at the Internet like a large but loose democratic community by treating links between sites as votes and weighting for popularity. And while Brin and Page gave the original formula for PageRank in a conference paper, much has seemingly changed with the algorithm. In the company's own words:

> PageRank performs an objective measurement of the importance of web pages by solving an equation of more than 500 million variables and 2 billion terms. Instead of counting direct links, PageRank interprets a link from Page A to Page B as a vote for Page B by Page A. PageRank then assesses a page's importance by the number of votes it receives. (Google.com, 2004a)

PageRank is clearly a more complicated algorithm for Google, Inc. than it was during Page and Brin's graduate student days. The company now boasts of over 500 million factors involved in ranking a page, though no one outside of Google knows what these factors are, and how important they are in comparison to its PageRank technology. Such

information is a closely guarded company secret, one that is likely worth hundreds of millions of dollars.

One concept that survived Google search's transition from academic project to corporate superstar is that of *objectivity*. Google prides itself for having removed human manipulation from the process, letting its algorithm "objectively" determine relevance. "Google search is an easy, honest and objective way to find high-quality websites with information relevant to your search," claims the company website (Google.com, 2004c). As Brin and Page (1997) originally suggested, PageRank is "an objective measure of [a page's] citation importance that corresponds well with people's subjective idea of importance" (p. 4). This chapter aims at Google's historical and present claim of objectivity and neutrality in information sheparding. Though I do not disparage the quality of their results or their market success, it is this notion of objectivity, particularly as it plays in the production of knowledge that I wish to deconstruct.

Why Google?

If this chapter interrogates the positions search engines hold in knowledge creation, then why limit the conversation to Google? Would it not be best to extend the scope of analysis to other major players in Internet search, particularly Yahoo, MSN, and AOL? Is Google, Inc. *that* important to the present and future knowledge economy? The short answer is yes, I believe it is, but it really should not matter. Google has come to represent the *position* of the search engine in world of ideas and information. It may be in ten years that some other search technology dominates the landscape. Some have even predicted the death of Google (Shafer, 2005). If so, this philosophical critique should still be relevant because it examines the position of the search engine more than the

company itself. Still, of all the current search technology companies, Google is clearly the most interesting case.

This chapter discusses Google in exclusion to the other search engines and Internet portals because of Google's current market share and its trajectory of growth. Although it is sometimes difficult to operationalize, many market reports continue to show that if someone searches the Internet, it's likely they are using Google (Fallows, Rainie, & Mudd, 2004). For example, in December 2005, Americans conducted 5 billion online searches, with 49% of those conducted through Google, a 6 percent increase from the year prior. Google's closest competitor is Yahoo, which captured 21 percent of all searches (Glasner, 2006). Such market dominance has yielded significant profits for this young company. Google's stellar economic metrics have made it the darling of Wall Street and their investors. It is quite possible that with its current market position, enormous economic capital, and expansive technological infrastructure Google could achieve its ambitious corporate mission: "To organize the world's information and make it universally accessible and useful" (Google.com, 2005). If successful, Google would be become not just the most influential company in the world, but possibly the most influential *organization* as well, surpassing prominent nation-states. While I do not deny that this claim is radical, others have anticipated this shift in world dynamics due to globalization. Japanese business-writer Kenichi Ohmae has effectively announced the end of nation-states, pronouncing such entities as "fictions" (Giddings, 2000).

Another reason Google makes for provocative analysis is that it has intentionally positioned itself as the good-conscience company. The motto it has adopted to guide its actions is an ethical one, "Don't be evil" (Google.com, 2004b). It argues that its

PageRank technology leverages the "democratic" nature of the Web; its founders Page and Brin have stood firm about preserving the integrity of the search from commercial forces, having been quite adamant about never selling placement in its organic search results. In the conclusion of their academic paper on Google, Page and Brin opine about the problems of a commercialized search, suggesting that the business model for search companies (placed advertisements) complicates the relationship between user and results. "In general, it could be argued from the consumer point of view," write the Brin and Page (1997), "that the better the search engine is, the fewer advertisements will be needed for the consumer to find what they want" (p. 25). The obvious conclusion here is that if users find what they need through the organic results, why would a potential business need to incur the expense of paying for a placed advertisement? Since its founding, Google has tried to position itself between the sometimes rugged realities of the market and the needs of its users, with varying success. Consequently, it makes good sense to discuss the implications of Google's position in the world of ideas (a.k.a. the Internet). I turn to this task presently by discussing the important ways in which those that study the Internet cast its power relations.

Asking Questions of a Query

There are several ways scholars and informed observers have come to consider the role of popular search engines on the Internet. These perspectives can be organized into three broad divisions, what I have termed the egalitarian-utopian, the structural, and the post-structural. The three viewpoints differ in how they construct power relations on the Internet; that is, ways in which agents relate to each other. The first is what I label the "egalitarian-utopian" perspective, a viewpoint that fashions the Internet as the highest

public good, a commons of global reach that will allow the free exchange of information and ultimately the salvation of society. As such, many Internet egalitarians fashion the Internet as a space devoid of power relations, a utopia of relationships and resources. The second perspective are those who frame power relations structurally, and in doing so, often describe individuals dominated by large corporate or institutional entities. Structuralists often view the Internet as an extension of real-world power structures in which large organizatons extend their hegemonic control to virtual spaces. The third and final perspective in this schema is that of the post-structuralists, who deconstruct the notion of the powerful and the oppressed. Post-structural commentators do not position the Internet as the tool for the disenfranchised as the egalitaritan-utopian may; nor do they emphasize hegemonic control and influence over the Internet by institutions, as the structuralists often does. Rather from a post-structural perspective, the interactions of searchers, content producers, and search engines create a complex set of relations that produces knowledge. For poststructuralist and Foucault, Google does not set out to regulate the information economy, but through a set of relations with users and web content producers, all three work together to do this – perhaps unknowingly. The post-structural perspective is represented in this chapter by the illuminating work of Michel Foucault.

Table 1 provides a brief snapshot of the similarities and differences found among these three perspectives on the Internet. What follows is a more extended treatment of the egalitarian-utopian, structural, and post-structural perspectives of the Internet. A more extensive discussion of these viewpoints will lead to a more complete (or less incomplete) understanding of the discipline of knowledge on the Internet.

Table 1. Summary of perspectives

	Egalitarian-Utopian	Structural	Post-Structural
Power on the Web	Absent or in the hands of individuals	Wielded by dominant individuals/institutions	Impersonal; not leveraged by individual agents
Freedom of actions	Total	Minimal	Limited by field of relations
Information	Wants to be free	Is censored by search engines	A product of power relations, therefore non-neutral
Google is...	The confirmation of Internet democracy	Gatekeeper of the Internet	Agent in a complex field of power relations
The Internet is...	Utopia	An extension of real world power structures	A field of power, discursive
Theorists	Morville; Reynolds	Bourdieu	Foucault

Utopian-Egalitarian Perspective of the Internet

For many informed observers, Google's image campaign is harmonious with the "democratic" and "egalitarian" nature of the Internet (see Chapter 8 for a full discussion of the division of reviews regarding the Internet's democratic possibilities). Those egalitarian-utopians see power on the Internet as either absent or in the hands of individuals. The Web is the tool leveraged by an "army of Davids" to harness the power

of "horizontal knowledge" – loosely coordinated knowledge across an Internet-based network of relations – to compete more effectively with the world's Goliaths (big media, big corporate, big government) (Reynolds, 2006). It is a medium for the people by the people. Such an understanding allows for utopian underpinnings, building the Internet to be an ideal space

Within the discourses in technology, egalitarian-utopianism has a well-established history. Writing at the beginning of the twentieth century, communication theorist Charles Horton Cooley reflected back on the technological developments including the railroads, telegraphs, daily papers, and telephones. In describing this "new epoch in communication," Cooley's (1909) words embody the soul of the egalitarian-utopian perspective: "[These technologies] make it possible for society to be organized more and more on the higher faculties of man, on intelligence and sympathy, rather than on authority, caste, and routine. They mean freedom, outlook, indefinite possibility" (p. 81). This perspective has penetrated a number of institutions. Cooley's words represent the quintessential egalitarian-utopian approach to communication technologies, a long-standing hope that was revitalized with the development of the Internet. John Seely Brown (2000), Howard Rheingold (2003), Joe Trippi (2004), John Battelle (2005), Glenn Reynolds (2006) and others tend to see promise and potential in the Internet due to its open architecture. These commentators argue that the Internet's open architecture creates a platform that quite naturally supports expanded community, democratic exchange, and free discourse. As Morville (2005) confesses in *Ambient Findability*, "... when it comes to the Internet and the future of ambient findability, I'm an optimist. In Marshall McLuhan's insight that the medium is the message, I see the power of the Internet to

engage people as participants in the collaborative, productive enterprise of knowledge creation and dissemination" (p. 15). For some, the Internet is another coordinate along the path of scientific progress, on that will "affect the world seismically, rocking us as the discovery of the scientific model, the invention of printing, and the arrival of the Industrial Age did" (Gates, Myhrvold, & Rinearson, 1996).

If the Internet is an egalitarian utopia, then Google is merely a tool to assist the individual Web user in their journey to acquire better information, collaborate with peers, and further the self-actualization of society. "Google is *our* culture's principal way of knowing about itself" writes Steven Johnson (emphasis in original, 2005, p. 120). It is a "tool which [has] fulfilled the original dream of digital machines becoming extensions of our memory" (p. 124). Many egalitarian-utopians see Google as an extension of the democratic principles fundamental to the architecture of the Internet. Peter Morville concludes that one of Google's "secrets of success" is the effective utilization of human produced "metadata tags" (information describing information on the Web). He writes, "Google's PageRank algorithm recognizes inbound links constructed by humans to be an excellent indicator of aboutness. Google loves metadata" (p. 53). Google helps information that "wants to be free" (to borrow from Stewart Brand (1988)) be found.

There certainly is room to be optimistic and enthusiastic about the Internet. The unique characteristics of this medium have opened up a number of possibilities in terms of information access and availability. Often, it is the techno-optimists who first recognize what the future may hold for us all, and as Lao-Tzu said, "To see things in the seed, that is genius." There is considerable value in the work of Vannevar Bush and others featured in Chapters 3, who anticipate the importance of the Internet. Yet, to rely

on optimism alone, is to accept technology's influence uncritically, as reflected in Thomas Edison's ambitious (and now infamous) proclamation for education in 1922: "I believe the motion picture is destined to revolutionize our educational system and that in a few years it will supplant largely, if not entirely, the use of text books" (Monke, 2004). The egalitarian-utopian perspective may tell too simple of a story to encompass the complex set of relations that embody the Internet. As I hope to demonstrate in the coming sections, nothing that ties people together lies outside a web of power relations.

A Structural Perspective: Bourdieu

Though egalitarian-utopians can be structural in their observations, structuralists tend to conceptualize the Internet quite differently, framing the Internet as a sociotechnical entity that is, in effect, an extension of real-world power structures in which large institutions extend their hegemonic control over individuals. As a general approach, structuralism assumes that machine-like structures organize human experience, and suggests that reality is composed of relationships rather than objects. The structures that form relationships between objects are often very visible institutions (education, economic relations, political/governmental, religion) and more subtle forms (language, culture). For the structuralist, individual subjects neither originate nor control their social existence, mental life, use of language, or experience with phenomenon like technology. Structural theories hold that power operates unidirectionally through recognizable systems of dominance and subordination.

Structuralists often are cynical and pessimistic of the revolutionary potential of the Internet, arguing that the egalitarian power of the Web is primarily rhetoric rather than reality, citing Internet usage statistics that take the form of a "power law

distribution." This means that a small percentage of web sites have captured the majority of site traffic on the Internet (Hindman, Tsioutsiouliklis, & Johnson, 2003).

Structuralists' reservations about the egalitarian nature of the Internet may be confirmed by Google's success and large user base, which has changed the shape of the Internet. While the Web can be accurately cast as architecturally decentralized, as a knowledge network search engines like Google have formed relative centers. Due to its tremendous popularity, Google exercises enormous "power" over knowledge creation and formation through the "capital" it imparts onto information. Google's capital is not an economic or cultural capital, but is better understood as a variant of what French soliologist Pierre Bourdieu (1983) theorized as "symbolic capital." Bourdieu (1983) defines social capital as, "the aggregate of the actual or potential resources which are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance and recognition" (p. 248). In other words, social capital is a benefit garnered from advantageous grouping and associations. Social capital can be transferred through a variety of mechanisms, such as family name, school, party affiliation, or as Bourdieu (1983) explained "by a whole set of instituting acts designed simultaneously to form and inform those who undergo them" (p. 249). Google is such an instituting act. Because of and through its position as a data broker, Google gives a certain credential to information that it lists high on its search results, a sort of *relevancy capital*.

The Web is a universe of billions of pages and in order to have voice on the Internet, to have your ideas exposed to an unfamiliar audience, finding rank with Google is essential. A survey of popular web literature confirms this, with titles like *Google Hacks Exposed: Improving Your Rank on Google*, *Building Your Business with Google*

For Dummies, and *How to Do Everything with Google*. Google is big business. There's real economic value to being listed among the top sites for specified queries. On-line marketing experts and entrepreneurs understand that finding rank with Google will be rewarded with immense *exposure*. Broad exposure is the economic capital of the Internet. It's why companies pay seven-figure sums for recognizable domain names like *business.com*. Internet exposure is the equivalent to the three rules for conventional businesses: location, location, location. Google's *relevancy capital* has a real economic currency, much like more traditional examples of social capital. These types of interconnections should not be surprising, as Bourdieu (1983) argued, "social capital is never completely independent of [economic and cultural capital] because the exchanges instituting mutual acknowledgment presuppose the reacknowledgment of a minimum of objective homogeneity, and because it exerts a multiplier effect on the capital he possesses in his own right" (p. 249).

Using terms like *relevancy capital* to describe Google's role in the ecology of information on the Web is helpful and important for Internet studies. However, such a presentation is also incomplete. It ignores the cycle of relationships necessary for Google to exist, and it presents power as that which can be harnessed and leveraged in a hierarchy of relationships. Thus, Google exercises its power to control the experiences of Internet users by the information it presents as relevant. However, the millions of users who use Google (or any search engine) are the ones that make it relevant. If Google lost 90% of its user base, as once popular search engines Altavista, Infoseek, and Excite have, would it have immense *relevancy capital* to distribute? Google matters because Internet

users make it matter; it is a cyclical relationship of power that is best explained by using the illuminating ideas of Michel Foucault.

A Post-Structural Perspective: Foucault

The third perspective on Internet power relations is the post-structural perspective. Post-structuralists conceptualize power quite differently than the egalitarians-utopians who optimistically ignore it, or as the structuralists who envision it as something obtained, used, and directed at people. For the post-structuralists, such as Foucault, power is ever-present, but impersonal, meaning that it cannot be controlled, wielded, or leveraged. Under such a formulation, power is understood not something to be possessed, but as a field of relations between agents.

For Foucault, power is not best represented by monolithic structures, easily reduced to monocausal sources and unidirectional relationships. Foucault develops his understanding of power through a methodology he labels genealogy, a "history of struggles." Genealogies are often seen as a reaction against forms of history that emphasis continuity and the search for origins. Some forms of historiography seek to find fundamental "essences" or narratives that explain the course of human events, and as such, are often termed "totalizing histories" (Prado, 2000). Marx's perspective that the course of human of events can be explained primarily through class struggle is one example of a totalizing history. Foucault explains that genealogies do not seek grand answers and are not "positivistic returns to a more careful or exact form of science...[rather] they are precisely anti-sciences" (Foucault, 1980b, p. 83). Foucault employed genealogy to determine how power is exercised through normalizing practices of societal institutions including madness, sexuality, and the penal system. As an

example, take Foucault's (1995) study of the penal system in *Discipline and Punish.* He begins the book describing in gruesome detail a public execution in eighteenth century France, which he contrasts with a rigorous schedule of activities for inmates from a prison in Paris just eighty years later. Foucault's stark contrast reveals the dramatic change from the spectacle of public torture to an institutionalized modern carceral system: "We have, then, a public execution and a timetable" (p. 7). Received history may tell us that such a dramatic transformation was the result of a more civilized, humane society. What Foucault shows through extensive historical research is that the move from the "gloomy festival" of public torture to the prison "is not a story about force and compulsion. It is a story about the manufacture and control of souls..." (Prado, 2000, p. 66). In other words, Foucault's genealogical method rejects a monolithic presentation of power being welded by a dominant majority, and replaces it with a system of relations that makes possible a different view of what is good and normal.

Foucault's position on power differs drastically from a structural understanding of power, such as the one offered by Marx or Bourdieu. For Marx, power was a tool or weapon wielded in the grand conflict of class struggle. It is held and used by industrial capitalists against the working class, whom they wish to suppress, limit, and exploit. This type of structural understanding of power has a significant footprint in Western society. Much of the media consumed by Americans emphasizes structural understandings of power, often involving conspiracies that extend between large corporations, government entities, or the financial elite. If Foucault were a movie director, perhaps movie plots would be drastically different.

For Foucault, power is quite a different matter. Perhaps the key difference between a structural understanding of power and the embedded network model of power that Foucault describes is his rejection of power as domination. "Power comes from below," writes Foucault (1980a), "that is, there is no binary and all encompassing opposition between rulers and ruled at the root of power-relations, and serving as a general matrix" (p. 94). He recognized no universal machine restricting the marginalized while empowering the elite. Power is not monopolized by a few; rather, it is the inevitable force between different people at different times in different ways. It cannot be held; it is impersonal; it is not universal, but contextual. In *Power/Knowledge*, Foucault (1980b) details for the reader many of the complexities of power outside of a structuralist framework:

> ... power is not to be taken to be a phenomenon of one individual's consolidated and homogeneous domination over others, or that one group or class over others. What, by contrast should always be kept in mind is that power, if we do not take too distant a view of it, is not that which makes the difference between those who exclusively possess and retain it, and those who do not have it and submit to it. Power must be analyzed as something which circulates, or rather as something which only functions in the form of a chain. It is never localized here or there, never in anybody's hands, never appropriated as a commodity or piece of wealth. (p. 98)

Perhaps a good working definition for Foucault's power is that power is a complex field of relations; it is actions upon actions, not actions upon individuals. Prado (2000) provides a model that may help illustrate how power functions as a set of relations on individual actions. Prado asks his readers to imagine a number of magnets spread out on a surface. Circulating through this field of magnets are the "vectors" of magnetic force. Now, suppose someone spreads iron fillings throughout the field of magnets. Due to the force of the magnets, the fillings would shift and move as to align themselves with

the current of forces around them. And if we move the magnets around, the field of forces shifts, sometimes unpredictably, and as such, the fillings would also move concordantly. This is similar to how Foucault presented power as relations. "In this model or analogy," writes Prado, "the magnets are agents, the fillings are behavioral options, and the force vectors are power" (p. 72). As Prado's magnets shift (agents act), power reconfigures the behavioral options, making new possibilities while removing old options. Thus, power affects the actions of individuals. Also apparent in this analogy is the impersonality and pervasiveness of power. Because power is seen as a field, no one can possess even a portion of power. And just as no filling could escape the field of magnetism, we all find ourselves inside power's web. Though dynamic, power's effects are continually present. "There are no spaces of primal liberty between the meshes of its network," writes Foucault (1980b, p. 142).

The Central Question: How?

So if power is not simply some superstructure that acts on the marginalized, how does it work in regard to the Internet? I suggest that in open-access systems like the Internet, structural understandings of power are highly problematic; rather, the medium is inclined to the distributed sense of power Foucault describes. Amid the architecturally decentralized, discursive spaces of the Internet are many agents – those that surf and search, those that publish (professionals and hobbyists), and those that provide web services (search engines, collaborative technologies like blogs, photo sharing). As these agents interact, they do so through power vectors that run throughout the network.

My analysis will focus on the increasingly important role of search engines in the world of information, though not in the structural sense employed by many in the popular

press who vilify these technologies. Emblematic of the stubborn modern mindset from which many writers work is Markoff and Hansell's (2006) article "Hiding in Plain Sight, Google Seeks an Expansion of Power." Their opening is both forceful and explicitly structural: "On the banks of the windswept Columbia River, Google is working on a secret weapon in its quest to dominate the next generation of Internet computing. But it is hard to keep a secret when it is a computing center as big as two football fields, with twin cooling plants protruding four stories into the sky." Notice the heavy emphasis on domination in the authors' description of Google – words like "secret weapon" and "dominate" cast Google as a monolith of power on the Internet. Yes, Google holds an important position in the information economy; yet, our use of Google is what makes it important. This complicated *relationship* between free agents on the Internet can be best explained through some of Foucault's most widely discussed ideas – the relationship between power and knowledge or power/knowledge, the process of normalization, and gaze.

Power/Knowledge/Truth Circuit and Google

A common theme in Google's corporate mantra is the notion of objectivity. Through PageRank, Google claims to serve "objective" knowledge to its users. For example, when discussing its GoogleNews service, the company suggests that because computer algorithms select the news stories for the service without human intervention, then "news sources are selected without regard to political viewpoint or ideology, enabling you to see how different organizations are reporting the same story" (Google.com, 2006b). Whether describing their search tool or ancillary services, the common assumption prevalent in Google's corporate communications is that it provides

objective, value-free, neutral information to its users. This thinking runs counter to Foucault's perspective, which sees knowledge not as universal, fixed, or objective, but as particular, contextual, and discursively constructed. One of Foucault's most illuminating ideas is that power and knowledge are inextricably related, and combine to produce "truth," forming a circuit of exchange. Foucault saw knowledge and power working together, as "the formation of knowledge and the increase of power regularly reinforce one another in a circular process" (Foucault, 1995, p. 224). One of Foucault's contributions to the field was situating truth (the product of knowledge) within power relations. In other words, without clear absolutes in truth, truth is the product of power.

The production of knowledge through the application of power to produce truth is important in the quest to understand power relations on the Internet and to explain the role of Google. The Internet is a vast network of information. At its most fundamental level, the duty of the Internet is to move bits of data from server to browser. As Weinberger (2002) explains, "The Internet is designed to move bits *and not* to decide which bits to move, which bits to block, what is done with bits, and whether anyone should have to pay for receiving particular bits" (p. 148). When constraining our understanding of the Internet to that of substructure, Weinberger is right. Architecturally, physically, and logically the Internet is a faceless, detached enterprise that just passes bits, without understanding what information those bits represent. However, such a bounded view of the Internet provides a shallow understanding of how information becomes knowledge on the net. There is nothing sterile, objective, or neutral about the Internet and its interactions, and like the physical world, objective truth/knowledge is not to be found on the Internet, despite the sophistication of search engine algorithm or the

openness of the Internet's design. The activity of Google to filter out billions of pages, leaving users with a sorted list of the most "relevant" is a virtual example of the power/knowledge circuit (one that occurs billions of times each year). The circuit begins with the user's need for information, and her search for knowledge in the sea of information on the Internet. Google, through its popularity and brand loyalty, is more often than not the agent on the Internet with which the user forms a relationship. By turning to Google, the user is giving the search company the opportunity to pare down the Internet from a diverse set of ideas to a condensed set of "relevant" knowledge – knowledge that should fit the user's needs and be of high quality. In this way, Google has taken raw information and produced knowledge through a power relationship.

This circuit of exchange including the three principle parties – information producers, information seekers, and information sorters – involves what Foucault (1995) called in *Discipline and Punish* "rituals of truth." In the penal system, the rituals of truth are the common elements of any TV crime show – the indictment, trial, testimony, analysis of evidence, courtroom theatrics, etc. Such rituals form the mechanics of the process of producing knowledge – in the case of a trail, a legitimate sense of innocence or guilt. The process of the Internet search also includes various "rituals of truth." It includes those practices which "legitimizes" the validity of the Internet results: the notion of the Internet crawl, searching each site for new and update information to add to its ever growing index; the publication of optimization rules for information producers; advance query options for information seekers; a listing on the main search interface of the number of documents being searched; the division in results between organic hits and

paid advertisements; suggestions for other search terms. The sum of these practices creates an atmosphere of legitimization for the knowledge produced on the Internet.

It is important to keep in clear view that the process of the Google search is an enactment of power through a set of relations between free agents on the Internet as opposed to a coercive action of domination on the part of Google. It is the freedom of the participants of this exchange that erode at the validity and utility of a structural presentation of power, one that casts power as something that is wielded by some against others. Power is "exercised over free subjects, and only insofar as they are free" (Foucault, 1982, p. 221). Most of the enthusiasm for the democratic potential of the Internet is over the relative freedom of its participants including the web publisher, the knowledge seeker, and information sorter. This *triangular array* of relations is predicated on the free participation of its agents. It is the freedom implicit in web power relations that disqualifies Google as a true gatekeeper or censor of the Internet. More accurately, with its relationship with millions of Internet users, Google is best viewed as a producer, not excluder, of knowledge. As Rieder (2005) says, "Power runs through the capillaries of this network and with reference to Foucault we have to understand power as a *productive force*, not as an inhibitor. Search engines are best understood as producers, not censors" (emphasis in original, p. 29).

This relational perspective of power has yet to fully saturate the market of ideas, likely because structuralism offers an intuitive understanding of power relations. Rather than emphasizing the relational aspect of power, structuralists emphasize the position of power. For the structuralist, Google's position is at the central of the virtual world, and as such, it is able to wield a tremendous amount of power, controlling information.

Given its privileged position and capitalistic objective, Google is an untrustworthy guardian of knowledge, and we as Internet users, must seek ways to circumvent its power and position (or so a structuralist may argue). Trend's (1997) comments illustrate a structural understanding of power in technology and new media: "On one level, this power creates hierarchical relationship between its subjects and objects, between those who act and those who are acted upon. Often this results when novel communications technologies simply extend the capacities of institutions like banks, utilities, and government" (p. 108). Notice how Trend sees power acting on individuals (as opposed to their actions) thus shaping his conception of agency: there are those who act and those who are acted upon. Trend sees technology as a vehicle that replicates the current power inequalities from social institutions. Later he argues that the development of new media "rarely proceeds in the interest of democratic ideals"; rather, technology is no different than other significant cultural institutions, and "can only empower those who possess it and who have access to it" (p. 108). Consequently, it is as if the values of the powerful and elite are embedded in new technology and media. As Bowker and Star (1999) suggest, "Values, opinions and rhetoric are frozen into code" (p. 135).

It is understandable that many have cast the Internet as an egalitarian utopia of power relations, a democratic technology. After all, in comparison to conventional media outlets, the Internet is an environment free of the usual publication gatekeepers. But the freedom to publish can only take us so far; after all, if I rant about politics on my blog, and no one reads it, what have I changed? The uneasy reality of the Internet is publication does not equal voice. Anyone can publish, but only those who master the Tao of Google can avoid being the voice in the wilderness. Each time we use Google, a

power relation is formed. Google does more than merely pass search results onto its users. Every display of results is an enactment of power, as Google determines whose truth becomes relevant. In effect, it is a clear example or paradigm of Foucault's theory about how power produces truth. "We are," as Foucault (1980b) explained, "subjected to the production of truth through power and we cannot exercise power except through the production of truth" (p. 93). Truth cannot be extricated from the power to legitimize it, and power never ceases its registration of truth. As a result of the search engines' sorting role on the Internet, knowledge, truth, and power work together as a circuit of exchange.

Normalization on the Net: Google as a Dividing Practice

The social construction of "normal" is not a new sociological, psychological, or philosophical issue. Foucault used a variety of fundamental experiences – sexuality, mental illness, prisons – to illustrate how power has play in normalization. He sees normalization as a process "that traverses all points and supervises every instant in the disciplinary institutions compares, differentiates, hierarchizes, homogenizes, excludes" (Foucault, 1995, p. 183). It is one of "the great instruments of power," as normalization has the capacity to "impose homogeneity" (p. 184). Essential to the process of normalization is the "dividing practice" – the social exercise that separates, differentiates, homogenizes, and excludes. It is by accentuating socially constructed differences, by making the normal and abnormal, that the power to conform is enacted through "binary division." Dividing practices and normalization establish homogeneity through the creation of differences through categorizing, indexing, and the creation of taxonomies. As Foucault (1982) restated in "Subject and Power," "The subject is divided inside

himself or from others. The process objectivizes him. Examples are the mad and the sane, the sick and the healthy, the criminals and the 'good boys'" (p. 303).

If we think of normalization as the imposition of homogeneity, then it is likely that the Internet is the last place one would expect to see strong normalization practices. The Internet appears to be an umbrella name for a unity of diversity, a wildly free and open platform for the publication and propagation for ideas, many of which have little currency in other media markets. Ironically, it is the success of the Internet to provide a robust vehicle for information exchange that has created the regular activity of normalization on the net. In order for users to find what they need, more often than not, a search engine is required. In a space as information rich as the Internet, there must be some means to enact the common activities of normalization – to compare, differentiate, hierarchize, homogenize, and even exclude information users want from the rest of the Internet. Through their complicated algorithms, search engines like Google perform billions of sorts each year, *dividing* for the user *relevant* from *irrelevant* by a complex and dynamic algorithm whose patterns are an industry secret. Thus, we see an example of how power constrains actions by providing a "field possibilities" (Prado, 2000). The enactment of power through Google's actions provides users a range of possible options for their queries, while at the same time constraining their search behaviors by not providing other (less relevant) sites. This example demonstrates how through Foucault's presentation of power, actions constrain other actions, not individuals.

As the most popular search engine in the world, Google is trusted to create a relevancy index for any information on the Internet, with those results most satisfying to Google's algorithm finding their way to the top of the list. Those "hits" on the first ten

pages have considerable exposure resulting in significant opportunity in the market of ideas. In effect, Google *makes them relevant* not by the content of their pages, but in the position they hold in Google's ranking system. Of course, Google could not do this alone – we make Google popular through our use; it in turn remanufactures our use of its service, producing relevant information for us. This certainly flies in the face of a conventional understanding of "relevance," but perhaps "relevance" holds concurrent but contradictory meanings, similar to what Gestalt psychologists refer to as "multistability." I would suggest that relevance on the Internet has come to be that which is both meaningful to the user's interest and that which holds high ranking in Google's search standings. Without both meanings, relevancy on the Internet implodes. After all, I can create a wonderful website with fantastic information on any number of topics, but without the relevancy that Google adds to the data on my page (no matter how targeted to the Internet user's interest) my information is doomed to obscurity and irrelevance. This position on relevancy demonstrates what Foucault established by historical archival study of the construction of madness – that the difference between two behaviors or ideas, say the insane and the sane, is highly contextual, changes through time, and is created through power relations.

While Google divides, sorts, and ranks information on the Internet, it also influences the construction of content on the Internet. Its activity of sorting implicitly imposes homogeneity on the Web, as web publishers work diligently to optimize their sites. "Search engine optimization," SEO as it is often called, is the science and art of leveraging the varying assets of a website to give it maximum rank on search engine's indices, such as Google's. Though Google should not be seen as dictating web design, its

activities of normalization include the homogenization of website structure. Web designers may be fearful of what researchers from several traditions have described as "the principle of least effort." Thomas Mann (1993) neatly summarizes the problem of least effort by explaining that "most researchers (even 'serious scholars') will tend to choose easily available information sources, even when they are objectively of low quality, and further, will tend to be satisfied with whatever can be found easily in preference to pursuing higher-quality sources whose use would require a greater expenditure of effort" (p. 91). This phenomenon was also captured by Zipf, who argued that "each individual will adopt a course of action that will involve the expenditure of the probably least average of his work (by definition, least effort)" (Chrzastowski, 1995, p. 639). According to an extensive U.S. survey of internet users by Jupiter research group iProspect, 62% of those surveyed click on a search result on the first page, and almost all (90%) did not go deeper than three pages of results for information (BBC, 2006). If web users are unwilling typically to move past the first set of responses of an Internet query, then Google's definition of relevant becomes increasingly important as the Internet grows, influencing the form of "good" websites. Internet entrepreneurs realize that they must massage the structure and form of their website to stay at the top of the Google rankings. Thus, web designers often experiment in ways to manipulate PageRank, though one search engine optimization consultant commented, "PageRank can be manipulated, but before doing that, I need to point out that a page will be included in the Google Index only if one or more pages on the web link to it. That's according to Google" (Craven, 2006).

An Army of Davids: A Case Study

In one final section of analysis, I turn to the organic search results found within Google to consider whether a single search may help illuminate the philosophical questions raised in this chapter. On January 1, 2007, I launched my web browser and "googled" for [army of davids], the short title for Glenn Reynolds' (2006) recent book, *An Army of Davids: How Markets and Technology Empower Ordinary People to Beat Big Media, Big Government, and Other Goliaths*. In his book, Reynolds offers an extensive list of examples of how individuals are outmaneuvering large institutions, thanks to information technology, and as such, a search for information related to his book may make for an interesting, if not ironic, case study. Searching for a book about the Internet's utility for an army of individuals is ironic because such a query appeals to both individual web content producers (through its content) and commercial institutions (through the virtue that the book is for sale, and is promoted on Reynolds' popular blog, InstaPundit.com).

The cast study, then, is a search for material related to Reynolds book, using the most popular search tool available, Google. The top ten most "relevant" websites related to the query [army of davids] include:

1. Amazon.com's page featuring the sale of *An Army of Davids*.
2. Business Opportunities Weblog. This blog is "a moderated list of legitimate business opportunities for entrepreneurs. It is presented like a weblog with chronological archives and extensive outbound links." The organizer of this blog gives a brief blurb related to the book.
3. David Lee Roth's "Roth Army" website, complete with a "Sammy Hagar insult generator".
4. Blogger Michelle Malkin's summary of the buzz surrounding *An Army of Davids*
5. Blogger Wonkeete's review of a debate among Rhenolds, Trippi, and Barry C. Lynn, author of *End of the Line* about the power of the Internet to revolutionize the political landscape.
6. Barnes & Noble.com's page featuring the sale of *An Army of Davids*
7. Political Pundit and Blogger Arianna Huffington's review of the book

8. University of Texas at Austin faculty member Clay Spinuzzi's review of the book.

9. Blogger Andrew Sullivans comments on a FOIAed Rumsfeld memo from 9-11, which seems to implicate a coordinated effort to pin 9-11 on Sadaam Hussein. He uses the title, "Army of Davids" for his blog posting.

10. The limited government think-tank Cato Institute describes a book talk given by Glenn Reynolds on *An Army of Davids*.

These results can be read through the lens of any one of the three perspectives discussed in this chapter. The egalitarian-utopian would likely be pleased with these findings, appreciating the heavy presence of Reynolds' blogger loyalists. Six of the top ten results are blog-style entries, though they varying in their relevancy to Reynolds' text (one being completely unrelated). The egalitarian-utopian may be concerned, however, that Reynolds' own blog does not make Google's top ten (it was number 12 on this particular day with this query).

The structuralist would likely not be surprised by the heavy commercial influence in the search results. Two of the top six organic results are sites selling the book, with the top spot held by the ultimate Internet commercial Goliath, Amazon.com. The structuralist would argue that when it matters, commercial institutions, through their heavy capitalization of web technologies, are easily able to outpace hobbyists in gaining the top position on search results. By working closely with other commercial operations like Google, large book sellers are able to maximize the rank of their sites through the efforts of their army of professional information architects. In this way, the Internet mirrors real-world dominance and control of institutions over their users.

The poststructuralist may say that the uneven results of this search query point to the complex set of relations involved in the information economy of the Internet. By using Google, a user actively participates in a matrix of power, the results of which are

best demonstrated in the search results themselves. No single entity, bloggers or commercial vendors, were able to fully capture the coveted top ten. Bloggers held more spots, but commercial entities held the higher rankings. Even David Lee Roth's fan website is an indication of the enigmatic circuit of power-knowledge exchange found on the Internet. The post-structuralist may also observe that different queries produce different results. A search for ["army of davids"] is different than [army of davids] (without quotations), making control over Internet (by either commercial institutions or independent-minded bloggers) impossible. Thus, structuralist hegemonic visions of dominance or egalitarian's utopian beliefs ring hollow when confronted with the organic results of a Google search.

A Complicated Summary

Survey research on the Internet has shown that the majority of Internet users in the United States rely on search engines to find information that is relevant to their needs. Search engines are more than just tools that web surfers use to find information; rather, they are regular components of the Internet, shaping the experience for most users in their daily surfing (Fallows, Rainie, & Mudd, 2004). This is understandable, given the challenges of navigating an expansive space without formal hierarchy. More alarming, however, is the trust Internet users lay at the feet of these search engines, like Google. Fallows (2005) has provided two findings which raise concern about how search engines are viewed by those who use them. First, Internet users are very positive, but unsophisticated in how they use search engines. They feel search engines provide them with satisfying answers, and typically settle on the use of one search engine, regardless of how search technology may change over time. Second, many Internet users are unaware

of the distinction between paid and unpaid results. Often, users of the Web lack any awareness as to the financial incentives that affect how search engines perform.

These empirical findings support the central thesis of this essay. The Internet is accepted by some as a value-free knowledge network, a heteroarchical space in which diversity of information reigns supreme. Capitalizing on the robust faith modern societies place in technology, technopundits such as Joe Trippi (2004) have cast the Internet as the "last hope for democracy" (p. 5). However, a Foucaultian analytic can problematize the notion of 'value-free' information. Whether in the classroom, the printing press, or the Internet, knowledge is a product of power relations, and as such, remains value-laden. On the vast plains of the Internet, it is Google that categorizes the enormous diversity of ideas to a simple list of ten "relevant" results. It creates abstracts of the Internet by reducing the full panorama of ideas to a more dense, but manageable representation. While useful, necessary, and arguably inevitable, search engines are identifiable players in the truth-power-knowledge circuit. What they are not, though, are hegemonic monsters. This chapter rejects a perspective that casts the search engines as the central player in the attempt to control the Internet. Such a story would not be the best use of Foucault. As Prado (2000) writes, "What Foucault does is provide a new way of saying something about how the vastly complex totality of human actions regulates behavior *without that totality having regulation as its objective*" (*emphasis in original,* p. 70).

Power and the Internet is not a simple story to tell. Absent from this tale is a simple binary distinction between those that have all the power and those that do not. It would appear that complexity is the cure for false dichotomies, and certainly the

landscape of the Internet could serve as an archetype of complexity and diversity. Therefore, it is important, both for theoretical and pragmatic purposes, to explore how power is exercised on and through the Internet. As Howard Innis (1951) explained, "A medium of communication has an important influence on the dissemination of knowledge over space and over time and it becomes necessary to study its characteristics in order to appraise its influence in its cultural setting" (p. 33). Understanding the hidden assumptions of the Internet is a worthy endeavor. The Internet is, as Foucault (1980) urged in *Power/Knowledge*, "a study of power in its external visage, at a point where it is in direct and immediate relationship with that which we can provisionally call its object, its target, its field of application...where it installs itself and produces real effects" (p. 97). The dividing practices – common to search engines in general and specifically to Google – do produce real effects, but these effects are felt on actions – not individuals. Search engines produce – not censor – by providing a field of possibilities that both give options and constrain action through the absence of other options. These effects can be fairly understood as the "discursive marginalization" – the privileging of information on websites that best conforms to the normalizing practice that is Google's ranking algorithm. History has taught us that an Internet without a search engine is unmanageable, and it is not the intent of this chapter to condemn or otherwise vilify Google. My purpose is to acknowledge the role power plays in the selection process found at Google. Foucault argued that the unforeseen power is the greatest power of all. Perhaps in today's "information age" this is most true where we tend to recognize it the least – in the search engines that discipline knowledge on the Internet.

CHAPTER 5
HYPERTEXT SEMIOTICS

"When I use a word," Humpty Dumpty said in rather a scornful tone,
"it means just what I choose it to mean – neither more nor less."
Lewis Carroll, Through the Looking Glass

What is a hyperlink? On the surface such as question seems trivial, akin to asking, what is paperclip? Both are a means of connecting two objects together – with paperclips tying hard-copy documents and hyperlinks tying soft-copy documents. More accurately, paperclips can clip more than just paper together, and hyperlinks connect more than just virtual pages and text; they bind any two web objects on the net together (text, images, sound, video – in general "hypermedia"). As the inventors of the World Wide Web explain, "links can point to anything that can be displayed..." (Berners-Lee, Calliau, Luotonen, Nielsen, & Secret, 1994, p. 907). But even in its more inclusive forms, the concept of the hyperlink seems pretty elementary. So why have a growing number of scholars, techno-pundits, and informed observers contemplated its nature? What is so deep about a connection from A to B?

In recent years, many scholars have expanded the definition of the hyperlink. A more encompassing understanding of a hyperlink is as a relationship between two discrete pieces of hypermedia on the Web (Carr, 1999; Haas & Grams, 1998). Jay David Bolter (2001) emphasizes the relational nature of hyperlinks by describing them as the electronic equivalent of a footnote (p. 27). Instead of having to look at the end of a page, chapter, or book for the reference, the reader needs only to click to the reference. Like footnotes, hyperlinks are markers, road signs that point to something else. Unlike footnotes, Bolter emphasizes that hyperlinks can be nested (like footnotes to footnotes) and make no assumption about what which page in a sequence of interlinking is the

primary text. Burbules and Callister (2000) expand the notion of the hyperlink beyond that of a neutral connection between elements on the Net. These scholars argue that "links can change the way in which material will be read and understood – partly by virtue of the mere juxtaposition of the two related texts" (p. 84). Links are not just associative, but also transformative. They do more than provide a pathway from A to B; "they express meanings, they betray biases, they invite or suggest inferences, and sometime they manipulate the reader" (p. 84). Bowker and Star (1999) offer a similar understanding as they suggest that each hyperlink creates a category, a "judgment about two or more objects: they are the same, or alike, or functionally linked, or linked as part of an unfolding series" (p. 6).

Ultimately, a recognition of the qualitative sensibilities of hyperlinks leads to classification of different types of hyperlinks. Writing years before the launch of the World Wide Web, Trigg and Weiser (1986) organize links found in bounded text networks into a three-tiered classification system. It begins with those links that foster movement along a train of thought, in which the link is a direct extension of the narrative found in the original text. Links may also be considered "side trips," or asides to the primary narrative which enhance or extend the line of thought through digression. Lastly, links may present a fork in the line of thought, one that provides different paths based on the user's needs or interest. While agreement in the classification of links is a dim possibility, most agree that there is more to the link than meets the eye. As Battro (2004) suggests, hyperlinks introduce the possibility of exercising a "click-option" that will produce a "simple change of state in a system," one that "unfolds a new dimension in the virtual space of the digital world" (p. 79-81). In other words, a simple binary

decision – click or don't click – offers an exponential increase in the number of choices for the hypermedia reader. A simple quantitative choice yields a profound qualitative difference. It's the virtual version of the "butterfly effect" (a small click can have a profound effect on the experience of the Internet).

My goal is this chapter is to build upon the work of those who offer a more nuanced appreciation for the hyperlinks and hypertext. The early chapters of this dissertation feature the tools of philosophy, psychology, and history in describing the ecology of the Internet. This fifth chapter explores the Internet with an additional lens – that of semiotics and literary analysis. Primarily through Saussure and Wittengenstein's most influential texts, we will gain an appreciation for the implications of hypertext for language theory. The Internet's hypertext represents an exciting opportunity to reconsider fundamental notions of literature and language – the author, the reader, the text, the construction of meaning – in an entirely novel way. The marriage between literary theory and hypertext is one that is well formed, drawing extensive discussion from Nelson (1981), Landow (1997), and Bolter (2001), among others. Such scholars are likely to view hypertext systems (including the Internet) as a postmodern network of textual interconnectedness featuring multiplicity, openness, and plurality. Barthes (1974) describes such a textual system in the opening pages of *S/Z*:

> In this ideal text, the networks are many and interact, without any one of them being able to surpass the rest; this text is a galaxy of signifiers, not a structure of signifieds; it has no beginning; it is reversible; we gain access to it by several entrances, none of which can be authoritatively declared to be the main one; the codes it mobilizes extend as far as the eye can reach, they are indeterminable; the systems of meaning can take over this absolutely plural text, but their number is never closed, based as it is on the infinity of language. (p. 5)

Barthes succinctly describes for the reader many of the characteristics of change associated with a discursive representational system such as the Internet. His ideal textual network is like a möbius strip having no beginning and no end, a structureless system that can be read in any direction with no one position in the text holding privilege or authority. Unlike Gutenberg's galaxy, the Internet may be a universe without center, authority, or singularity – or so such an understanding would suggest. It is a textual organism which offers far different possibilities than the fixed relationships in print culture. Yet in order to understand the dramatic linguistic shift that the Internet may represent, one must begin with the enduring but arbitrary connection between words and the concepts they represent, the bridge between what Barthes identifies as the *signifier* and the *signified.* The relationship between words and their meanings is a question that has been considered long before the advent of the Internet, and is best understood through the writings of Wittgenstein and Saussure.

The Reaction to Nomenclaturism

Ludwig Josef Johann Wittgenstein and Ferdinand-Mongin de Saussure had more in common than not. Both men came from families of wealth, privilege, and influence in the 19th century Europe. Each established himself early in his career with a stunning academic publication. For Wittgenstein, it was his Tractatus Logico-Philosophicus, which earned praise from Bertrand Russell, G.E. Moore, and some members of the Vienna Circle; whereas, Saussure published his influential 300-page monograph "Memory on the Primitive System of Vowels in the Languages of Indo-Europeans" when he was only 21. Both scholars studied language (though Wittgenstein was not confined to its study) – its development, nature, and philosophical significance. Also, each is

remembered not for his early work, but for their research published posthumously. Yet, the most intriguing aspect of Wittgenstein and Saussure's similarities is the transformation each man underwent from his early thoughts on linguistics to the work he completed near the end of his career. From the available evidence, it would seem that these two men would qualify for what Weiland (2003) describes as an "amended identity," a change in viewpoint that occurs over the span of a scholar's life.

Arbitrariness: Through Inheritance and Use

It was no accident that Saussure and Wittgenstein's scholarship contains so many similarities. Both men were reacting against the long-standing belief that "words function essentially as names of objects or properties already given in advance of language," a movement widely-known as "nomenclaturism" (Harris, 1988, p. 7). Nomenclaturism has held a prestigious position in Western intellectual history, due in part to its position in the religious traditions of the West. Christianity's account of the creation of the world is one of the better known examples of nomenclaturism:

> "Out of the ground the LORD God formed every beast of the field and every bird of the sky, and brought *them* to the man to see what he would call them; and whatever the man called a living creature, that was its name" (Genesis 2:19).

The Koran emphasizes this same relationship, "And [God] taught Adam all the names, then presented them to the angels; then He said: Tell me the names of those if you are right" (The Cow, 2:31).

As these accounts illustrate, nomenclaturism assumes a meaningful relationship between words and their definitions, but even more so, religious texts were often used to propose a perfect relationship between words and concepts. It is the idea that if the names of things were received from some divine system, then the role of linguistics is to

unearth this perfect, ideal system after centuries of corruption through human use. Corruption through use is a subtle, but defining quality of nomenclaturism. This characteristic is most prominently in Plato's dialogue *Cratylus* (Harris, 1988). Unlike Christianity's account, which seated the power to name with a human in Adam, Plato's language is not of human origin, but the work of a figure who is only referred to as "the name-maker." The name-maker created the language that adhered to certain basic (but unknown) principles. There was a logic, a Platonic ideal, embedded in the words that we were to speak. However, this grand system did not hold its ideal form, for through "the course of human history, usage exercised a corrupting influence on language, and these original principles are no longer observed" (Harris, 1988, p. 9).

These are two of the more sensational examples of nomenclaturism. Some examples are more subtle than what the divine order of names suggests. In *The Order of Things*, Foucault (1973) provides an example of nomenclaturist thinking that lies beneath the surface of language and is found in its very structure. He describes Claude Duret's theory that some ancient peoples (such as the Hebrews, Canaans, Samaritans, and Egyptians) write from right to left, "following the 'course and daily movement of the first heaven, which is most perfect, according to the opinion of the great Aristotle, tending towards unity'" (p. 36). The Greeks, the Romans, the Maronites, the Serbians, and all Europeans (among others) write from left to right, "following 'the course and movement of the second heaven, home of the seven planets.'" The Indians, Chinese, and Japanese structure their writing from top to bottom, "in conformity with the 'order of nature, which has given men heads at the tops of their bodies and feet at the bottom'. Lastly, the people of Mexico "write either from bottom to top or else in 'spiral lines, such as those made by

the sun in its annual journey through the Zodiac.'" Duret's conclusion is one of high symbolism and deep meaning in language representation: 'by these five diverse sorts of writing the secrets and mysteries of the world's frame and the form of the cross, the unity of the heaven's rotundity and that of the earth, are properly denoted and expressed.' Foucault comments that the symbolism contained in Duret's description is "one of analogy rather than signification" and as such, casts language as a system of "symbolic function... but since the disaster at Babel we must no longer seek for it – with rare exceptions – in the words themselves but rather in the very existence of language, in its total relation to the totality of the world, in the intersecting of its space with the loci and forms of the cosmos" (p. 36). Thus, we find in Foucault's description of Duret's work another example of nomenclaturism, one that is less literal and more structural. It finds meaning in the arrangement of language, even if the words themselves have lost their "natural" connection to the objects they represent.

Saussure and Wittgenstein were both motivated to devise a theory of language which addressed what they considered to be the serious deficiencies of nomenclaturism. Where nomenclaturism required a single, explicit connection between a word and the object or property it represents, Saussure and Wittgenstein both argued for multiplicitious types of relationships defined through human activity. In short, they embraced the collective but arbitrary process of language development. I begin with the general framework devised by Saussure.

Ferdinand de Saussure

Swiss linguist Ferdinand de Saussure was first to frame his linguistic study around the relationship between a word (sign) and its meaning. This concept formed the basis of

Saussure's science of signs, or what he called *semiology*. Despite Saussure's early splash in linguistics with "Memory on the Primitive System of Vowels in the Languages of Indo-Europeans," the majority of his academic career was surprisingly ordinary. He held a variety of professorships around Europe, lecturing on Sanskrit and other Indo-European languages. However, this all changed in 1907. While teaching at the university in Geneva, Saussure took over the general course in linguistics, a class he taught until near the end of his life. From his student's lecture notes, editors assembled a work of enormous scope and influence, *Cours de linguistique generale* ("Course in General Linguistics").

Cours: The Language of Linguistics

In *Cours,* Saussure's (1959) primary task is to explore the nature of language systems. He defines language [or *langue*] as "both a social product of the faculty of speech and a collection of necessary convections that have been adopted by a social body to permit individuals to exercise that faculty" (p. 9). Saussure's notion of language as a "social fact" points to the arbitrary nature of language. Most famously, he observed that the connection between words and their meaning is arbitrary. He developed the vocabulary to describe such relationships, that of the *signifier* and the *signified.* The word (sound-image) "cactus" is a signifier that signifies a large, prickly plant common to deserts. The process by which English-speakers settled on "cactus" to signify such a special type of plant is social, communal, and arbitrary. This is not to say that language systems develop without any rhyme or reason, as Saussure reminds us, the term *arbitrary* "should not imply that the choice of the signifier is left entirely to the speaker...I mean that it is unmotivated, i.e., arbitrary in that it actually has no natural connection with the

signified" (p. 69). Perhaps surprisingly, the arbitrary connection between signifier and signified protects language from modification. Arbitrary connections require communal collaboration. Language is used by everyone, a product use, and at the same time, is a heritage of the preceding period. This makes for a complex system that is resistant to change, and yet, as a product of culture, language is always under change and development. As such, a speaker cannot by mere act of *parole* (speech) change the language system (*langue*); the *sign* is not arbitrary in the sense that any *one* person can change its connection with the signified. Rather, the connection between a sequence of sounds and a concept is arbitrary in the sense that it "could be represented equally by just any other sequence is proved by differences among languages: the signified 'ox' has as its signifier *b-ö-f* on one side of the border and *o-k-s* (*Ochs*) on the other" (Saussure, 1959, pp. 67-68). Put another way, Lévi Strauss argues that the sign is arbitrary *a priori*, but non-arbitrary *a posteriori* (Holdcroft, 1991).

Saussure aids his reader with this distinction by providing for a spectrum of the arbitrary. He describes that some signs are completely arbitrary, or unmotivated, while others may be relatively motivated, in that they are assembled with some purpose or intent. As an example, he uses the French words *vingt* (twenty) and *dix-neuf* (nineteen). There is no rational connection between *vingt* and the concept of twenty; therefore, Saussure labels this sign as unmotivated (arbitrary). However, *dix-neuf* is a composite of *dix* (ten) and *neuf* (nine), giving some motivation to the assembly of the sign. So, *dix-neuf* can have some motivation even though its individual component signs, *dix* and *neuf* are completely arbitrary. Saussure (1959) summarizes the spectrum of motivation he sees in language:

> There is no language in which nothing is motivated, and our definition makes it impossible to conceive of a language in which everything is motivated. Between the two extremes – a minimum of organization and a minimum of arbitrariness – we find all possible varieties. Diverse languages always include elements of both types – radically arbitrary and relatively motivated – but in proportions that vary greatly, and this is an important characteristic that may help in classifying them (p. 133).

Saussure's spectrum of motivation in language is an important one, not only in moderating his theory of linguistics, but also in serving as a reminder that monolithic generalizations about something as complex and variegated as language can be problematic. In this spirit, Saussure provides further clarification in *Cours* as to the nature of the signifier-signified connection. Specifically, Saussure identifies other types of relations between words and concepts, devising a broad scheme resembling a network of connections. An important point to remember is that the meaning of any linguistic sign breaks down outside its linguistic system. This is due in part to the ites signs form with each other. For Saussure (1959) language is a system of signs bound by "syntagmatic" and "associative" ties, which he saw as "indispensable to the life of language" (p. 123). Syntagmatic relations are those connections within the realm of discourse. They are the relationships of words that are "chained together," through the linear presentation of text. Using the phrase *my house* as an example, the individual signs *my* and *house* are syntagmatically related in that they convey a different meaning together than when they are considered individually (Harris, 1988). *My house* also illustrates Saussure's associative relations, which are links to concepts and ideas not directly leveraged in the sentence. The individual sign *my* associatively relates to senses of self, such as me, you, his or her, while the sign *house* is associatively related to other concepts of dwelling, such as home, apartment, room, living space, etc. As Harris summarizes,

"The phrase *my house* thus represents a syntagmatically organized selection from a large range of associatively organized possibilities made available by the language" (p. 22).

Ludwig Wittgenstein

Wittgenstein also dedicates much of his scholarly writing to the connections between words and his meanings, and like Saussure, Wittgenstein struggled to find professional direction after his early success with *Tractatus*. In what was a pattern that remained true throughout most of his life, Wittgenstein had trouble finding his place in this world. He was known to wander from place-to-place, holding a range of occupations including a soldier in World War I, teacher, house designer for his sister, and lecturer of philosophy. Yet despite (or because of) his restless existence, Wittgenstein's work at the end of his career provides illuminating concepts that will prove quite valuable as we turn our attention to the relationship between technology and language theory. Though one could write an entire book on Wittgenstein's contributions to language philosophy (and many have), his best known and most influential concept lies with the position he assigns to word meaning. A review of Wittgenstein's work will reveal a dramatic shift in his position on the matter. I begin with his early work.

Wittgenstein's Tractatus

In *Tractatus Logico-Philosophicus*, Wittgenstein proposed that language worked as a broad collection of picture-relations. He saw language connecting to the world in a similar fashion as pictures connect to the world. Both do so in a "determinate way." Wittgenstein leverages the metaphor of a picture to express what he believed to be the fundamental properties of language. For Wittgenstein, a picture is a model of reality, and the elements in a picture represent objects in the world outside the picture. Because the

elements of a picture relate to each other and the objects they represent in a determinate fashion, so too must language hold the same properties (hence "picture-relations"). To drive his point home in *Tractatus*, Wittgenstein (1922) employs the use of another metaphor, that of the different forms of musical representation:

> At first sight a proposition--one set out on the printed page, for example--does not seem to be a picture of the reality with which it is concerned. But neither do written notes seem at first sight to be a picture of a piece of music, nor our phonetic notation (the alphabet) to be a picture of our speech. And yet these sign-languages prove to be pictures, even in the ordinary sense, of what they represent (4.011).

Just as musical scores provide a visual display of an auditory phenomenon (music), so too does language provide a medium transformation – it is a verbal picture of the world. The structure of language and the structure of that which it represents, the world of objects and properties, are the same. Just as "a gramophone record, the musical idea, the written notes, and the sound waves, all stand to one another in the same internal relation of depicting that holds between language and the world. They are all constructed according to a common logical plan" (Wittgenstein, 1922, p. 4.014). Thus, the argument of *Tractatus* is that to understand the logic of language is to understand the logic of the world. Language's role is to properly and sensibly depict the objects it represents; the object is the location of meaning. As Wittgenstein says, "A name means an object. The object is its meaning. ('A' is the same sign as 'A')" (3.203).

If Wittgenstein's position in *Tractatus* reminds us of the relationship between words and their meanings offered by the nomenclaturism, it is with good cause. Returning to philosophy years after his publication of *Tractatus*, Wittgenstein revisited his work, becoming his own harshest critic. The most noticeable similarity is that Wittgenstein still believed as he did in *Tractatus*, that "all philosophy is a 'critique of

language.'" The most notable difference between young Wittgenstein and experienced Wittgenstein is his position on the formation of meaning in language (Wittgenstein, 1922, 4.0031).

Meaning as Use

This noteworthy shift in Wittgenstein's thinking is evident in many of his later writings. Wittgenstein (1964) begins one of his first publications of this second phase of philosophy, the *Blue Book*, with a basic question, "What is the meaning of a word?" (p. 1). He answers his question not by relying on forms, structures, and "essential" connections, as he did in *Tractatus*, but by giving an example of how he now believes meaning is created. Wittgenstein takes his readers through a mental exercise, asking them to imagine a man. Suppose we turn to the man and point to an object of which he has never seen, and tell him, "This is a banjo." What happens to the man's understanding of the word "banjo"? Wittgenstein (1964) wonders with his readers:

> Possibly the word 'guitar' will then come into his mind, possibly no word at all but the image of a similar instrument, possibly nothing at all. Supposing then I gave him the order 'now pick a banjo from amongst these things.' If he picks what we call a 'banjo' we might say 'he has given the word 'banjo' the correct interpretation'; if he picks some other instrument – 'he has interpreted 'banjo' to mean 'string instrument'" (p. 2).

This example illustrates Wittgenstein's emphasis on the activity of language. Meaning, for Wittgenstein, puts life into signs (words). A sign that is nonsensical, such as "wootellium," is a dead, lifeless sign. But how is it that meaning is imparted into words? Wittgenstein's (1964) answer in *Blue Book* is harmonious with Saussure's framework in *Cours*: "But if we had to name anything which is the life of the sign, we should have to say that it was its *use*" (emphasis in original, p. 4). In his most famous work, *Philosophical Investigations*, we are told that "the meaning of a word is its use in

language" (Wittgenstein, 1997, p. 43). This represents a radical shift in Wittgenstein's approach to language. Rather than fixed, essential meanings, in which the single logic of language parallels the structure of reality it represents through stable picture-relations, Wittgenstein now views meaning-making as a process – one that is social, contextual, and fluid. No longer does Wittgenstein recognize a singular logic in language, "but many; language has no single essence, but is a vast collection of different practices each with its own logic" (Grayling, 2001, p. 78). Wittgenstein replaces a perspective on language that emphasized singularity with one that favors multiplicity, essence for difference, fixed for fluid, and an autonomous existence of language to a system that is fully integrated to the diverse activities of human beings around the world. This was a major break from the intellectual tradition that made *Tractatus* popular.

What does it mean to define meaning through use? In analyzing Wittgenstein's presentation, we see a much more subdued conceptualization of "meaning as use" than a knee-jerk analysis would allow. For Wittgenstein (1997), meaning as use implies that linguistic understanding is a practice not a process: "To understand a sentence means to understand a language. To understand a language means to be master of a technique" (199). This skill is quite visible throughout his writing, particularly when he equates language technique with mathematical technique: "Let the use of words teach you their meaning," just as one can say in mathematics, "let the proof teach you what was being proved" (p. 220). The meaning of words or phrases is a skill, one that emphasizes understanding how the words are used across a variety of language contexts, or what Wittgenstein calls "language games", which consists of "language and the actions into which it is woven" (Wittgenstein,7).

The Language Game

Even a quick reading of Wittgenstein would reveal that he makes liberal use of a variety of metaphors to frame his study of language. Language as a game is one of his most effective metaphors, one that he happens to share with Saussure. By equating language to games one plays, Wittgenstein shows that meaning is created through use, but that use is guided by community rules, much like when someone plays chess. The player may play the game, creatively pursuing a unique utilization of the pieces at his disposal; yet, his actions are quite naturally constrained by the rules of the game. Like chess, the game of language is "simultaneously purposeful and purposeless," (Harris, 1988, p. 47). Both share a unique combination of characteristics. Games and language are both dynamic and static, compulsory and arbitrary, unbounded and controlled. Both Saussure and Wittgenstein recognized this strange paradox as the nature of language games.

By associated language with use, Wittgenstein is aligning himself with Saussure and forming an anti-nomenclaturism campaign. Both *Cours* and *Philosophical Investigations* recognize the inherent trouble with a position which claims that the meaning of a word is found in the object for which it stands. For these scholars, language is not a set of simple relations, independent and singular. It is a complex network of relations of varying degree and type. Thus, to understand words is not to examine a single connection to an object, but to determine the signifier's position in a linguistic system, one that is embedded in particular cultures complete with local variance. "The reference of the sign is to the system, not directly to the world," writes Allen (2000, p. 9). Language is shaped through its use, but also guided by the rules of the language-game,

giving the connection between signifier and signified varying degrees of arbitrariness. As we will see, the collective framework established by these relative contemporaries will prove an effective platform to examine language evolution on the Internet. Before we begin such an examination, it is wise to consider briefly how the introduction of technology's influence on linguistic systems would have been received by Saussure or Wittgenstein.

The Influence of Technology in Language Theory

The provocative nature of Wittgenstein and Saussure's work invites its use in Internet studies. In Saussure and Wittgenstein's theory of language change, we find all the elements necessary to examine the ebb and flow of linguistic evolution regardless of context – cultural, temporal, social, political, or technological. But suppose we want to add a second dimension to their analyses, such as technology. What influence does the technology of transmission and representation of language – whether auditory, visual, or through touch – have on the connections made between signifier and signified? Adding a second dimension increases the theoretical possibilities significantly, allowing for discussions of how technology influences language and how language may influence technological development. More importantly, it provides additional avenues to a deeper understanding of language theory itself, particularly how the *signifier-signified* connection may change across technological contexts. For all these reasons, it makes good sense to explore the linguistic-technological intersection. But what would these scholars think of this? Of the two, Saussure writes more directly to the influence of technology and communication media on language, though his position is surprisingly short-sighted.

As prescient, insightful, and lucid as Saussure's account of semiotics is, it is not fully comprehensive since it stops short of exploring the important role of technology in the influence of language and its sign parts. In *Cours,* Saussure (1959) argues that devices external to language, such as vocal cords or the electrical equipment used to transmit Morse code, do not affect or impact language. His analogy of the symphony is particularly useful in understanding his claim:

> Language is comparable to a symphony in that what the symphony actually is stands completely apart from how it is performed; the mistakes that musicians make in playing the symphony do not compromise this fact. (p. 18)

Certainly, one can appreciate Saussure's line of thinking, and given that he was theorizing in the late 19th and early 20th century, his theory of linguistics has been fundamental to the field for the last century. Yet, Saussure's treatment of technology as a system useful for transmitting language, like an orchestra transmits musical compositions, is not particularly helpful in this information age. His stance treats technology instrumentally, as a neutral tool that does not impact the use and development of language. This is not only philosophically problematic, but it also is inconsistent with his theorizing elsewhere. Saussure acknowledges later in his *Cours* that writing systems constrain and shape language. He passionately describes the "tyranny" of writing. "By imposing itself upon the masses," warns Saussure, "spelling influences and modifies language...visual images lead to wrong pronunciations; such mistakes are really pathological" (p. 31). Saussure was reacting against the influence of how language is represented on language itself – another example of "constructure" (see Chapters 2 and 3). He properly recognizes that the technology of writing has significant influence in the direction of development for language. While Saussure acknowledges the role of writing

in impacting language, he neglects to extend this understanding to other technologies like Morse code communication.

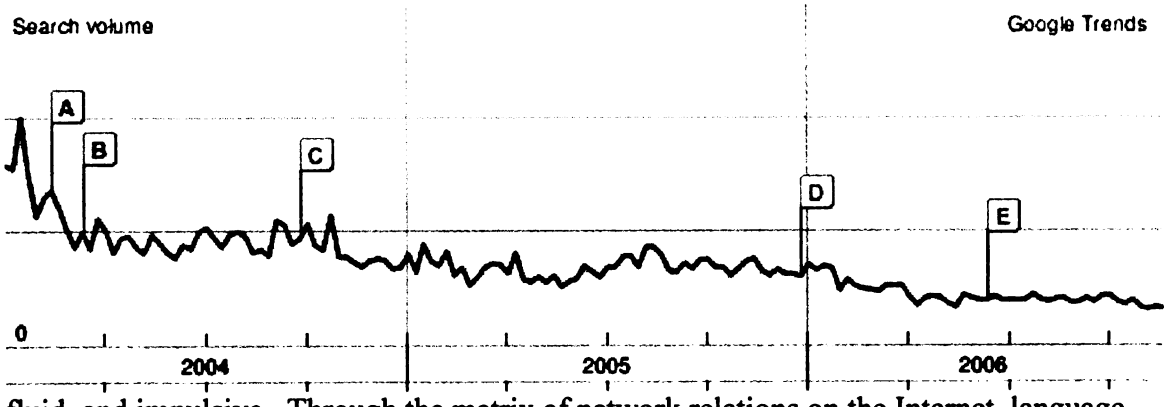
Though he ignores the effects of technology in language development, Saussure certainly recognizes the influence of geo-political forces on language. Saussure explores several social and political forces which pressure language systems to change. He writes, "Great historical events like the Roman conquest have an incalculable influence on a host of linguistic facts. Colonization, which is only one form that conquest may take, brings about changes in an idiom by transporting it into different surroundings" (p. 20). If great historical events can influence language, why not consider the impact of great technological developments such as print media, alphabets, or digital information networks? It is unfortunate that such a question was ignored by Saussure, as those interested in semiotics could have benefited from his diligent scholarship. This leaves a *Course in General Linguistics* as a work of great insight, but poor foresight.

This lamentation aside, it is important to remember that when Saussure prescribed direction for future work in linguistics, he left the door open for technological considerations. He insisted that the proper study of language puts it "into its social setting and frame[s] the question just as we would for any other social institution" (Saussure, 1959, p. 72). On the conservative side, part of any social setting is a technological condition, or more radically, technology itself is a social setting. If we are to treat the study of language like any other social institution, then there is an impressive precedent to include those ubiquitous technological systems – from alphabets to word processors – in its study. That said, what questions will be considered in such an effort?

The final section of this chapter explores examples of how the Internet may change language, a sort of *hypertext semiotics*. By hypertext semiotics, I invoke a connection to the past, to Saussure's genius and influence in early linguistic studies and at the same time aim to connect the importance of language studies with the principle member of the information age, the Internet. What follows is a theory of language development, one that discusses the continued relationship between *signifier* and *signified* in new spaces. In such a discussion, the reach of Saussure's framework will be tested, as the Internet shapes and twists conventional understandings of how meaning is made.

Hypertext Semiotics

The Internet gives the informed observer the chance to consider language in an entirely new fashion. As a socio-technical environment, the Internet provides two noticeable novelties to linguistics. First, it provides a chance for scholars to *see* language change occur amongst the most diverse collection of language users, one that ignores geographic and cultural borders. Like print text, hypertext provides a "snapshot" of language use in a particular moment in time. Unlike print culture, hypertext is dynamic,



fluid, and impulsive. Through the matrix of network relations on the Internet, language use and evolution can be monitored, tracked, and even seen. Using tools like Google

Trends, longitudinal language usage patterns are revealed. For example, the preceding chart shows the use of term "metrosexual" (describing the cosmopolitan male archetype) on the Internet. Searches for that term dominated 2004, but have slowly trickeled down since then. Through a fluid, dynamic, and open system of representation, the building blocks of Saussure's and Wittgenstein's language theories take on a new and different life. Second, the Internet provides more than just a new venue for old language theory. Rather than merely reaffirming the past, the Internet also affords new developments of linguistical understanding, those that draw from a posstructural perspective of language. I will begin with how the Internet reaffirms, or at least recasts, Saussure and Wittgenstein's language theories before I turn to what new developments the Internet may offer.

At the basis of both Wittgenstein and Saussure's semiotics is the arbitrary but constrained connection between sign and signifier. Though each scholar uses different vocabulary, the types of connections between words and their meanings is a subject of importance to both. On the Internet, the signifier-signified connection is reaffirmed in the most dramatic fashions. In both *Cours* and *Philosophical Investigations,* Saussure and Wittgenstein offer a variety of examples of the different types of connections between words and their meanings as a way to reinforce the notion that their language ideas are not restrained to a single language and culture. The first principle of a hypertext semiotics is that the connection between words and their various meanings has physical representation via the hyperlink.

The Linguistic Significance of the Hyperlink

Traditionally, the hyperlink has been seen as a navigation tool, as a means for asynchronous arrangement of information. Certainly, this is one use of hyperlinking.

However, the hyperlink is also a means of explicitly designating a relationship between a word (*sign*) and another idea (or group of ideas). Meaning on the Web is strongly influenced by such practices. Consider if I were to publish this chapter on the Internet. Because I am writing in English, I am constrained by the typical conventions of the English language game. There are certain established practices which dictate the form and function of my words and sentences, just as there are for the English speaker. However, as I write, the Internet allows for other linguistic possibilities. For example, suppose in referencing one of my favorite philosophers of technology, Nicholas C. Burbules, I create a hyperlink to his political blog. This would create a certain type of meaning, a specific signified-signifier connection, and a particular meaning as use. Certainly, a different meaning would be created if I linked Professor Burbules' name to his academic website. As such, hypertext reinforces the pre-Internet ideas of Saussure and Wittgenstein by confirming meaning's definition through use and arbitrary signifier-signified connection. But it does more than this. When I write for print or speak to an audience, I impart *syntagmatic* relationships on my words through their order. This is roughly the extent of my control over the network of relations for my words. I cannot suggest explicit signifier associations for my audience. But through hyperlinking, I can explicitly express what Saussure called *associative* relationships. I can dictate how words are associated with other dimensions of meaning. Am I referring to Nicholas Burbules the academic philosopher or progressive political commentator? Hypertext allows me to explicitly define such a connection. Put another way, the language game on the Internet is multidimensional.

The Linguistic Significance of Search Engines

Hypertext is not the sole means in a hypertext semiotics to expresses sign-sound connections. Search engines also serve as mechanisms for linking ideas with words. Billions of times each year, Google, Yahoo, MSN, and other search engines take signs that Internet users provide in the form of queries and connect those words with concepts and ideas, in the form of "hits" (websites). The relationship between search query and search results illuminates a number of the subtleties of linguistics described in this chapter. First, we see that the signifier-signified connection in search is arbitrary. The results provided by the engine are those sites that best meet their relevancy algorithms, which change often. Another search engine will likely offer different sites arranged in a different order to the same query.

Second, there are many possible connections between the *sign* (query phrase) and the *signified* (hits). In this environment, meaning is enacted through use when the user exercises the "click option" and selects a result, thus associating the subject of the site with her original query. Suppose someone is investigating me by googling for "Nick Sheltrown." What defines my meaning on the Internet will depend on which top ranking link they click on – my employer's website, my personal website, or my academic site (all different urls). The meaning of "Nick Sheltrown" is partially created when the user follows a link, and this meaning may differ from other meanings created in other contexts.

Third, today's search engine algorithms typically follow Google's emphasis on the use of hyperlinks as "votes" to determine their ranking. Thus, Internet searches may best reveal how the community of web publishers associate meaning with words. If search engines count hyperlinks as weighted votes (See Chapter 4), then they offer a tool

of incredible power for reflecting language use as it happens. If site A is the top of query B, then this may be an indication that for the Internet community, "A" means "B". This is particularly apparent in the practice of "Google bombing": the manipulation of Google's search results by a coalition of web publishers to make a political statement. In the typical Google bomb scenario, web publishers band together to link a key phrase to a desired website. For example, in early 2004 when searching on the phrase "miserable failure" on Google, the first result listed was a link to George W. Bush's presidential biography. As a well-publicized Google bomb, competition grew for the first slot on Google's results between the biographies of President Bush, President Carter, and Michael Moore. Google has since adjusted the mechanics of their relevancy algorithm to limit the effectiveness of Google bombers, but the game of Google bombing illustrates that importance of search engines in measuring the linguistic pulse of the Internet (Moulton & Carattini, 2007).

Finally, the linguistic role of search engines also tempers the autonomy of hypertext. As enthusiastic as we may be for the ability to expand linguistics into multiple dimensions, the reality of hypertext semiotics is best realized through its use, and use is most often determined through the query-search result connection described in the previous paragraph. Given the breadth and depth of the Internet, it is difficult to overestimate the importance of search engines in creating linguistic connections, and unless there is a dramatic shift in the organization of the Internet, search engines will continue to be integral meaning-making machines. Their algorithms will distill for millions of Internet users the range of possibilities for linguistic meaning.

As we have seen, the Internet provides a rich, new canvas against which we can apply the linguistic philosophy of Saussure and Wittgenstein. It neatly supports these scholars' stance against the nomenclaturist view that a single relationship, being the "name relationship" provides the "semantic basis for the whole of language" (Harris, 1988, p. 14). With varying types of links between words and concepts, the Internet confirms the diversity of word relations with which Wittgenstein opens *Philosophical Investigations*. As he observes, the connection between the name "Julius Ceasar" and the Roman leader, the word "red" and the color "red," the word "five" and five the quantity are all different types of relationships (Wittgenstein, 1997, 1). This is demonstrated no better than on the Internet. But to stop our analysis here is to tell only half the story. The Internet is also well positioned to influence language theory in ways that are wholly unique to this new medium. Though I appreciate the clarity with which Saussure wrote, it is here where my discussion of linguistics of hyperspace will break with his structuralist linguistic tradition.

Linguistic Change

Though Saussure recognized the influence of external forces on language, he insisted that language could be studied solely from an internal perspective if one so pleased. As Saussure (1959) explained, "I believe that the study of external linguistic phenomena is most fruitful; but to say that we cannot understand the internal linguistic organism without studying external phenomena is wrong" (p. 22). Clearly, he recognized the influence of external forces on linguistics, such as geographical and political influences, though he argued that such forces were not of the kind that could change the architecture of a language.

To explain his position, Saussure relies on his favorite metaphor of a game of chess. He suggests that language is much like a game of chess, "if I use ivory chessmen instead of wooden ones, the change has no effect on the system; but if I decrease or increase the number of chessmen, this change has a profound effect on the 'grammar' of the game" (p. 22-23). Thus, Saussure is distinguishing for his readers the difference between internal and external forces on language. External forces, for Saussure, are cosmetic changes at best – they are the words that are imported when two cultures mix, the changes in language when political alliance brings linguistic alliance. These are noticeable changes, as is the change from wood to ivory chess pieces, but they are also superficial in that they leave the architecture of the language intact. On the other hand, internal forces of change are those fundamental to the nature of the linguistic system. Though Saussure does not provide any direct examples, one can imagine that internal factors are those that come from within the community of use, are more than just a change in word preference or meaning, and alter the fundamental grammar (structure) of the language. For Saussure, internal forces create change to the "inner organism of an idiom" (p.21). Perhaps the development of gendered pronouns in languages like French and Spanish are examples of internal changes. Saussure defines for his readers the difference between the internal and external change through a circular reference: "One must always distinguish between what is internal and what is external. In each instance one can determine everything that changes the system in any way is internal" (p. 23).

Another way to think about linguistic change in a Saussurean system is to divide language between *langue* and *parole*. Recall that *langue* embodies the abstract principles, the rules of the language game. It is the structure of language, a "self-

contained whole and a principle of classification" – something that is not easily changed (Saussure, 1959, p. 9). Far less stable are *parole*, or individual speech-acts. *Parole* is the individual enactment of language, something that "always implies an established system and an evolution..." (p.8). Speech-acts both affirm the langue and in varying degrees, break from it. Thus, when Saussure speaks of linguistic study, he quite naturally bifurcates his linguistic analysis between the system (*langue)* and enactment of the system (*parole*). For Saussure, the division between *langue* and *parole* is parallel to the division between internal and external forces of change on language: changes in *parole* are those due to external forces; changes to *langage* are attributed to internal forces.

The division Saussure has created is a difficult one – it is difficult to define the level at which change is occurring; it is difficult to differentiate between internal and external forces; it is difficult to categorize the change in language we see on the Internet into one of these categories. So through the use of hypertext semiotics, we may problematize the division of views that Saussure has created, and in doing so may have discovered the limits to his structuralist perspective on linguistics.

Superficial Language Change through Technology

Certainly, many of the superficial changes to languages are results of external forces. As language groups mix, there is a certain influence that each will exact on the other. Words are imported and exported over time with few tariffs to block this trade. This is particularly true of the Internet. As a new form of representation, the Internet circumvents several of the barriers of language development discussed by Saussure, his emphasis on geography and time are less relevant. Recall that Saussure uses the Roman Empire as an illustration demonstrating how political changes create changes in language.

Like a political empire such as Rome, the Internet has colonized much of the world, and with each year increases its level of penetration and the extent of its reach. But it is more than a mere cultural/political empire – in fact, it holds very few properties typically associated with empires (hegemony, autocracy, repression). Rather, the Internet makes political empires less relevant by increasing the linguistic interactions of individuals around the world, collapsing the differences between local and standardized versions of language. It is a people-centered technology, and as such, it has opened up the range of linguistic possibility for people. The open means of communication that the Internet offers is like a liberal nation-state, which Saussure recognized as "no less important to the life of languages; certain governments (like the Swiss) allow the coexistence of several idioms; others (like the French) strive for linguistic unity" (p.20). Language in practice takes on a new understanding, where local language evolution is loosed from the constraints of the physical properties (distance, time) and social properties (civic, communal, cultural).

On the Internet, the differences between local dialect and received speech disintegrate, primarily due to the unique effects of the medium: The Internet is the synthesis of narrowcasting and broadcasting. Linguistically, this has enormous implications. Rather than a small group of producers controlling the spoken or written word in mass media – as we see in print media, television, film, and radio – the Internet circumvents such control, allowing local language variations to be broadcasted at an unforeseen scale. Television reinforces cultural norms of language; it unifies by creating a common, national linguistic culture. The Internet has the opposite effect: it blurs the

producer/consumer role of its users, diversifying linguistic culture through its open architecture.

Yet, as we begin to look at linguistic evolution on the Internet, we find evidence that more than mere cosmetic changes to language can occur through external forces. It appears that dramatic shifts in how we represent the *langue* can exact an influence on the *langue's* core properties. On the Internet, there is certainly plenty of superficial language evolution. Through the Web, we find a new vocabulary – blog, im, folksonomy, mouse potato, pod cast, etc. Two high school students chatting over instant messenger (im) may type "pos" if either of their parents comes in view of the computer, alerting their chat-mate that a parent is over her shoulder observing her communications. But the linguistic significance of the Internet extends well beyond hyper-slang. Through the interactions in virtual space, we find that one of the most enduring assumptions about how language is enacted is continually challenged – that is linearity.

Changing the Nature of the Idiom through Technology

In most conceivable representations of language, there is a certain rhythm, pattern, or perhaps – protocol – to how words are delivered. Whether we are speaking in person, through written text, or consuming media through radio or TV, linearity is fundamental to the grammar of many languages. The flow of communication is often sequential, orderly, and hierarchical. Yet, on the Internet, such attributes are not a universal condition for communication. Early on in Internet studies, some scholars pointed to the staccato interactions of Internet chatrooms as examples of nonlinear utterances (*parole*) in which the members' conversations weave in and out, competing for the attention of the group (Wallace, 1999, p. 10). Others have found that interactions of

instant messenger and texting are becoming some of the most ubiquitous aspects of the Internet (Carnevale, 2006; "Poll shows IM gap between teens, adults", 2006). Millions of users, particularly adolescents, use these technologies because they offer the necessary social bandwidth to support dense interactions with an extended social network. Users of instant messaging can manage multiple conversations currently, moving in and out of conversations as their interests dictate. In this way, the Internet provides for physical representation for impulsive talk and allows for concurrent speech.

Let's not also forget that the basic unit of architecture on the Internet, the hyperlink, is an ever-present exercise in non-linearity. Within a convention presentation of text, a link can disrupt the text, subvert its primacy, and send the user to secondary sources (which in fact may be treated more like primary sources). No technology of the Internet is more common than the link, and no technology challenges the primacy of linearity than this form of information architecture. According to the *OED,* the prefix "hyper" means "over, beyond, over much, above measure"; *hypertext* takes the reader "beyond" text's core properties of linearity and hierarchy to associative, multidimensional linguistic connections.

These examples illustrate that on the Internet, linearity can lose its hold on language. In its stead, we find a form of linguistic expression that is asynchronous, truncated, and informal. Instead of presenting ideas like a line that reads from left to right, language on the Internet may be better understood as a "labyrinth of paths. You approach from one side and know your way about; you approach the same place from another side and no longer know your way about" (Wittgenstein, 1997, 203).

The Need for a Poststructural Perspective

The Internet does more than provide examples of cosmetic and architectural change. It also erodes at the structural divisions that Saussure developed in *Cours*. The Saussurean framework of the signifier and the signified presents a useful starting point in developing a hypertext semiotics. Saussure is responsible for many of the basic properties of this relationship: the arbitrary nature of the sign, the collective development of the signifier-signified relationship, and the resistance of the sign to change. While Saussure (1959) suggested that subject matter of linguistics includes "all manifestations of human speech," language as speech captures more of his attention than other manifestations (p. 6). For Saussure, "language is speech less speaking" (p.77). As such, Saussurean semiology underemphasizes the importance of textual representation of language, particularly the importance differences between the writer and the reader. In developing a hypertext semiotics, the perspective of the reader/writer is important to consider, particularly as we compare such relationships in conventional print and hypertext. The words of Jay David Bolter (2001) summarize this change in the language game:

> Where printed genres are linear or hierarchical, hypertext is multiple and associative. Where a printed text is static, a hypertext responds to the reader's touch. The reader can move through a hypertext document in a variety of reading orders. Whether multilinearity and interactivity really do render hypertext better than print, is a cultural determination. (p. 42)

Bolter's summary emphasizes three important aspects of the effects of representation on the rules of a language game. First, he confirms the conclusions of this section: that hypertext has a different structural sensibility than print media. Second, he properly emphasizes that though hypertext is very fashionable these days, it is a matter of "cultural determination" whether hypertext is superior to print media. Consumers of information should be wary of a fallacy of presentism, where the latest is always the

greatest. New developments in representing language should not imply "progress" or the dawning of some linguistic utopia. Third, Bolter emphasizes the reader's role in creating meaning in hypertext. One of the limitations of the work of Saussure and Wittgenstein is the attention they give to the speaker/author in exclusion to the listener/reader. More recent work in semiotics can be viewed as a reaction against the emphasis common to early semiotics. Influential semoticians such as Barthes, Bakhtin, and Kristeva are "poststructural" in that they challenge the position of the author as one who engineers the meaning of a collection of words, the sign as a "sealed unit" ("whose closure arrests meaning, prevents it from trembling or becoming double, or wandering" (Barthes, 1981, p. 32)), and "Cartesian" character of the sign common to structural semiotics (signifier maps to signified as *x* maps to *y*). For poststructuralists, there is no single authoritative or "theological" meaning to a text; rather, the text is a "multidimensional space in which a variety of writings, none of them original, blend and clash" (Barthes, 1977, p. 146). Such scholars deemphasize the role of the author (or in Barthes' case, declare the "death" of the author) and elevate the role of the reader of the text. The connection between the signifier and signified is one that is determined by the reader's understanding, not the author's intent. Thus, many poststructuralist semiotic theorists prefer Kristeva's *signifiance* over Saussure's *signification*: "*Signification* implies the creation of meaning before the act of reading; *signifiance* implies that meaning is only ever produced in the act of reading" (Allen, 2000, p. 18).

Even in the nature of the text itself, the poststructuralists find evidence that the author's role is a limited one. In "Theory of the Text," Barthes (1981) draws back etymologically to define "text" as "tissue," an interweaving of "past citations" and "bits

of code, formulae, rhythmic models, fragments of social language..." (p. 39). What we often think of as the text, is by Barthes' definition the "work." As Barthes (1977) explains "...the work can be held in the hand, the text is held in language, only exists in the movement of a discourse" (p. 157). Though the hypermedia writer has the opportunity to explicitly declare the semiotic connections in multiple axes, her role is still subordinate to the history of the utterances and connections she chooses to employ. All linguistics instances are what Bakhtin called "dialogic" in that they are dependent upon prior usage. "The word in language is half someone else's," wrote Bakhtin (1981, p. 293). Language becomes one's own when the speaker "populates it with his own intentions"; yet, the word is never fully his, even after he appropriates it. It will continue to lie "on the borderline between oneself and the other" (p. 293). No matter the format, media type, language, the meaning of a text lies with what the reader/listener makes of it through its dialogic relations with other text. Perhaps this is why Bolter (2001) argues that hypertext reconstitutes or remediates print; ultimately, all utterances are a remediation of the past use.

Saussure's linguistic system of signification buckles under the weight of the Internet. The Internet erodes at the durability of some Sassurean positions. The Web excuses some of the basic barriers of language change discussed by Saussure, and also blurs the division he made between external and internal forces of change. The Internet represents ways in which external forces can change the way language works, the fundamental rules of Saussure's game. This should be of no surprise, as we saw in Chapter 2 the rise of print media changed the dynamics of language, creating the new forms in the essay and novel. The Web is giving rise to new forms of linguistic

expression, ones that take full advantage of the multidimensionality of hypertext. Weaved in and out of the linear presentation of text on the Internet are branches to ideas that enrich the underlying thought the writer is seeking to convey. More flexible than the footnotes of print media, the Internet allows producers to connect to an array of media types, or different ways of representing thought through language. Though initiated in a virtual realm, these effects are felt by both the producers and consumers on the Internet in the "real world." As is often the case, the virtual world turns out to be not so virtual (Burbules, 2004; Turkle, 1995; Wallace, 1999). Though it is experienced in a digital plane, the Internet's effects are felt outside the mesh of its network.

More importantly, however, to Saussure's legacy is the readerly nature of the Internet. Even more so than in print, radio, TV, and other "texts," the reader constructs meaning on the Internet through active reading and participation. Though the hypermedia writer may create a text, it will be read many ways, with variation in order, purpose, and experience. As Wittgenstein argued, meaning is found in use, and use is dependent on the participation of the reader. Thus, the text is always plural, "which is not to say it has several meanings, but that it accomplishes the very plural of meaning: an irreducible (and not merely an acceptable) plural" (Barthes, 1977, p. 159). Thus, any account that emphasizes the sanctity of signification tells only part of the story, and at that, a small part.

City of Language

The Internet is linguistically confusing for many reasons. It both confirms and challenges the conclusions of semiology as outlined by Saussure and Wittgenstein. On one hand, it provides rich new examples of syntagmatic and associative relations,

signifier-signified connections, and meaning as use, but at the same time, it fosters the collapse of the *physical* properties (geography, time) that make language change a supposedly stable process and supports a reader-centered approach to signification, one more akin to Kristeva's *signifiance*. It challenges Saussure's premise that external forces cannot change the fundamental properties of language by fostering new developments of linguistic expression that follow different rules. They are non-linear, multifaceted, multidimensional, complex, asynchronous, and evolving. It globalizes local linguistic phenomena, and localizes global phenomena. Loosing language from the chains of geography and time may do enough to erode at the very concept of a "language." Such an understanding contributes to Bakhtin's (1981) perspective that languages intersect, and in the process lose all meaning, "for apparently there is no single plane on which all these 'languages' might be juxtaposed to one another" (p. 291).

This difficulty may be resolved if we view language not as a single block, but as a collection of parts. Complete language may not consist of a unified, structural, hierarchal whole, but wide collection of parts situated in differing contexts. In one of his most impressive metaphors, Wittgenstein (1997) describes this understanding of language, which he identifies as the "city of language":

> ...ask yourself whether our language is complete; – whether it was before the symbolism of chemistry and the notation of the infinitesimal calculus were incorporated in it; for these are, so to speak, suburbs of our language. (And how many houses or streets does it take before a town begins to be a town?) Our language can be seen as an ancient city: a maze of little streets and squares, of old and new houses, and of houses with additions from various periods; and this surrounded by a multitude of new boroughs with straight regular streets and uniform houses." (18)

As Wittgenstein describes, our language is an ancient city, one that was built over thousands of years. It would be naïve to assume that in a little over a decade, a single

technology could transform the *entire* linguistic system. Yet, as I have tried to persuade in this chapter, the change induced by the Internet is not virtual, but real. It represents new possibilities in linguistic expression and challenges fundamental notions of presentation that have stood for thousands of years. Taking a page from Wittgenstein, I am suggesting that we could view language on the Internet as a "suburb" of language as a whole. This new suburb is not the same architecture with cosmetic changes; rather, it is a different type of construction altogether. In the center of our city of language, I see the oldest of all forms of linguistic representation – the spoken word. The abilities and limitations of human beings to develop verbal language systems laid the road map of the original city. Extending out from our center are many layers of suburbs, representing different epochs in language evolution. The changes in language were often engendered by their forms of representation - from the pictorial nature of language in hieroglyphics to the linear logic of codex books. Now, we find a new suburb, not with the straight roads and uniform houses as Wittgenstein imagines, but a winding maze of foot paths and alleyways, a network of subways and elevated trains, tunnels and bridges, all connecting houses that reflect the architectural differences of a diverse world. This is a hypertext semiotics.

CHAPTER 6
THE STORIED NATURE OF THE NET

> To say that all human thinking is essentially of two kinds – reasoning on the one hand,
> and narrative, descriptive, contemplative thinking on the other – is to say only what every reader's experience will corroborate.
> William James

> Every human being is interested in two kinds of worlds: the Primary, everyday world which he knows through his senses, and a Secondary world or worlds which he not only can create in his imagination, but which he cannot stop himself creating.
> W.H. Auden, *Secondary Worlds*

The Oxford English Dictionary tells us that a city is "a town or other inhabited place," and assuming the broadest possible understanding, the occupants of the 3-D virtual world found in *Second Life* would constitute a city, an *inhabited place*. Though conducted completely online, the activities of those who enjoy a *Second Life* are not uncommon to a first life found in many nonvirtual cities. "Residents" of *Second Life* create personal avatars and then participate in complex economies though the purchase, production, and sale of virtual goods. Members build friendships, date, attend art fairs, go to concerts, and work on home improvement projects. They form neighborhood associations and special interest clubs (such as Sci-Fi fans), commit crimes (cyberterrorism, racketeering) and perform charity. In many ways, the actions of *Second Life* are a lot like a first life.

Most of all, *Second Life* draws favorable comparisons to nonvirtual, "real" cities by the staggering number of people currently "residing" there. The company website boasts that *Second Life* includes over four million residents, and if accurate, makes it larger than most major U.S. cities including Los Angeles, Chicago, Houston, and

Philadelphia (Census.gov, 2005). In fact, New York is the only city in the United States with a population larger than *Second Life*.

The popularity of *Second Life* illustrates the importance of identity on the Internet, a chance for users to clarify, amplify, confuse, extend, solidify, destablize, and explore their sense of self. *Second Life* allows its residents to ask and answer questions about themselves that they are either unable or unwilling to resolve in their first life (the one outside the Internet). The psychological distance and anonymity found in *Second Life* coupled with the unusual opportunity to explicitly define a new "you" makes environments like *Second Life* a fascinating extension of personal introspection. It is similar to moving to a new town in which no one knows you, your name, who you are, or what you do, and amplified by the fact that you can manipulate your physical appearance – your size, weight, gender, skin color, dress, and even your species. As the site explains, it is "your world; your imagination."

The existence of immersive environments like *Second Life* (it is not the only example, but it is the best) only confirm Sherry Turkle's (1995) early prophecy about "a rapdily expanding system of networks, collectively known as the Internet, link millions of people in new spaces that are changing the way we think, the nature of our sexuality, the form of our communities, our very identities" (p. 9). In the mid-1980s, Turkle (1984) described the solitary computer as its user's "second self." How much more powerful is this relationship when computers connect people and all that they bring with them (ethics, values, beliefs, ideologies, politics, biases, prejudices)? Turkle's study of MUDs (Multi-User Domains) – role playing games in which users assume an alternative identity – seem underwhelming by today's standards because technology has advanced past text-based

command line interactions to fairly impressive, interactive 3-D environments. *Second Life* escalates the issues Turkle described and in doing so, allows its residents to modify the elements of identity that are typically held constant. Consequently, *Second Life* provides a platform to change one's story in previously unforeseen and unimagined ways. It highlights the importance narrative in creating identity development and world making.

A number of scholars have argued that humans use the stories they actively construct about themselves, their lives, and their experiences to define themselves and understand the world in which they live. Story telling is a way of unifying past and present experiences, as well as forecasting the emergence of a future self. As Dan McAdams (1996) explains, narrative is a framework for the construction of "more or less coherent, followable, and vivifying stories that integrate the person into society in a productive and generative way and provide the person with a purposeful self-history that explains how the Me of yesterday became the Me of today and will become the anticipated me of tomorrow" (p. 306). Narrative and identity have received increasing attention in recent years in the fields of psychology, philosophy, and sociology. As such, to understand how users leverage a technology like the Internet is to understand how this sociotechnical entity fits into our efforts to build and rebuild a coherent sense of self and our own private worlds. More so than other forms of media, I believe the Internet helps users answer important questions including, "Who am I, who have I been, and who shall I be?" and "What is my world like?"

The goal of this chapter is to not only explain what I mean by a "narrative construction of reality" and its impact on "selfing," but to show how these processes are part of the regular experience of Internet users. This chapter argues that the nature of the

Web is highly narrative in a way far different than television and other forms of media. I begin the chapter with a theoretical orientation. What follows is a short summary of the principle scholars contributing to the fields of narrative psychology, philosophy, and sociology. Following this orientation will be a more detailed exploration of the storied nature of the Net.

A Narrative for Narrative

A number of theorists, particularly psychologists and a few philosophers, argue that stories are a fundamental tool, a "root metaphor" (Sarbin, 1986), for how human beings organize their life experiences and establish their sense of self. They suggest that a longitudinal perspective of humankind's narrative leanings from prewritten history to present day yields a bifurcated understanding of the human being, biologically as *Homo sapiens* and psychologically as *Homo narrans*. Schrag (1997) provides a concise description of the *Homo narran* as "a storyteller who both finds herself in stories already told and strives for a self-constitution by emplotting herself in stories in the making" (p. 26). *Homo narran* implies that stories are a key identifying feature of human beings and are used to understand others, our world, and ourselves.

As McAdams reminds us, perhaps the most important characteristic of narratives is that they are generative: they help produce a coherent sense of self (what he calls the "storied self") and they create worlds or realities for which the self will occupy. Stories, exaggerations, myths, parables, tragedies, comedies, epic tales, and so on abound in the human experience, so much so, that these forms of narrative expression constitute reality as much as the elements which comprise them. Stories are not mere representations of reality but *are reality* to those that live and tell them. Such a reality is necessarily

personal, individual, and non-generalizable. Thus, a narrative reality is a personal enterprise inextricably tied to the story-teller's sense of self. Through stories, we come to a particular view of the world and ourselves. Yet, the exploration of a narrative reality and self is an undervalued activity, perhaps because of the ubiquity of the activity: "Its form is so familiar and ubiquitous that it is likely to be overlooked," wrote Bruner, "in much of the same way as we suppose that the fish will be the last to discover water" (p. 4).

The belief that narrative can constitute reality and is instrumental in the production of self is an important claim for this chapter and narrative psychology as a whole. These conclusions are not necessarily intuitive, and as such, require some explanation. How is it that words constitute their own psychological reality? After all, don't we merely use words to describe the "real" world? And how is it that stories inform our sense of identity? The answers to these questions come in two phases. First, I discuss the importance of words, and more generally language itself, to the human psyche. Through the influential Russian Psychologist V.S. Vygotsky and narrative pioneer Jerome Bruner, the central role of language will be established. Vygotsky argued that language constitutes reality and Bruner described reason/logic and narrative as the "two hands" of human sense-making. Second, using the illuminating work of Nelson Goodman, the mechanics of the narrative construction of reality and self will be explored. Goodman's work provides a provisionary framework for how humans may come to construct their worlds.

The Importance of Language

L.S. Vygotsky was an amazingly prolific psychologist whose work is still highly influential today, an impressive feat given that his research career spanned only ten years due to a premature death from tuberculosis. One of the defining characteristics of Vygotsky's writing and research is his belief that learning and development must be understood through their social environment, a perspective often labeled as "sociocultural." The most important cultural tool in a Vygotskyian sociocultural perspective is language, a fact reflected by Vygotsky's extensive attention to its development and role in human cognition.

The link between language and thought for the socioculturalist is a critical connection that warrants discussion. Vygotsky describes that as a child works to solve a problem, she will rely on speech to extend and even transform her thinking. For Vygotsky (1978), this convergence of language and activity is "the most significant moment in the course of intellectual development, which gives birth to the purely human forms of practical and abstract intelligence" (p. 24). Language frees us from our immediate perceptual experience, and allows us to extend knowing to the unseen, the unexperienced, and the unknown. When children use language, they ascribe to a system presented by their culture in an effort to construct a coherent representation of the world. It is more than merely a means of communicating; rather, it is the means by which social interaction and higher psychological functions are internalized (Miller, 2002). More than anything, language is a tool used to make sense of the world (Bruner, 1986, p. 72).

Vygotsky argued that the cognitive and communicative functions inherent to language give children new mental facilities by which to develop. Language filters into the child's subterranean mental processes, giving structure to experience. As Bruner

(1991) concisely stated, "The structure of language and the structure of thought eventually become inextricable" (p. 5). Language is thought; thought is language. This relationship is the basis for a narrative construction of reality. The nature of language constrains and extends the child's construction of the world around her. It does more than just color our experiences; it makes our worlds. If language structures her thinking, then words are the best suited building blocks for her conceptualization of reality.

As a cultural system, language empowers reality construction. This pluralistic sense of the universe is centuries old. Beginning with Immanuel Kant, philosophy has gradually retreated from a single fixed world to the existence of many worlds (Heim, 1993). Recently, philosophers such as Nelson Goodman recognize language's central role in the creation of our worlds. Goodman contends that the activity of world-making is complex, but above all it involves "making not with hands but with minds, or rather with languages or other symbolic systems" (Goodman, 1978, p. 42). Language, it would appear, shall serve as the bedrock of any narrative reality we hope to find – not just because language is the mode of narrative, but because it is the mode of reality. Not surprisingly, Bruner's (1991) words capture the essence of the matter: "...cultural products, like language and other symbolic systems, mediate thought and place their stamp on our representations of reality" (p. 3).

Vygotsky (1978) made a convincing argument for the role of language in a narrative construction of reality. He placed the complexity of human development within a social context through the use of language, "a development process deeply rooted in the links between individual and society" (p. 30). As *the* tool in our cultural toolkit, language forms our thinking, as well as shapes our reality. Yet, to argue that language and

narrative are used to structure our experiences is not to exclude reason, logic, and rationalism; rather, it is more likely that our psychological organization of reality relies on multiple methods. Jerome Bruner is sensitive to this relationship, offering one reality divided into two branches.

Bruner (1986) argued that the human psychological reality is bifurcated into two spheres: the structured realm of the paradigmatic mode of logic and science and the mode of story and narrative. Essentially, this is a dichotomy between the world of nature and the interaction of human affairs. These two modes of thinking, irreducible to yet complementary of each other, are illustrated in the Western world's approach to explaining the origins of the universe. Some lean on the *story* of creation, while others rely on the *theory* of evolution (Bruner, 1986, p. 88).

Some in psychology, such as Sarbin (1986), argue that Bruner's narrative mode of thinking is not *a* method of psychology but *the* method of psychology. For Sarbin, narrative has replaced the mechanistic and organic metaphors that have so heavily shaped the practice of psychology over the last century. Danger abounds in such a position. Through several of his writings, Bruner cautions against any monogamous approach to knowing. In *On Knowing: Essays for the Left Hand* (1963), Bruner employs the analogy of a two-handed person to describe a balanced approach to knowing. A "one-handed" approach to developing a psychological reality forms a myopic perspective, whether it be the right-handed universe of logic and science or the left-handed perspective of narrative, myth, and discourse. And although many (including myself) are fascinated by the power of narrative, it is erroneous to become enamored with any sphere of thought to the exclusion of all others. Bruner (1986) echoes this position in *Actual Minds, Possible*

Worlds, as he argues that "efforts to reduce one mode to the other or to ignore one at the expense of the other inevitably fail to capture the rich diversity of thought" (p. 11). In fact, to do so is asking the wrong question. "The question is not whether *two* sets of processes produce two different worlds," writes Bruner (1986), "but how *any* processes could produce the world constructions we find" (p. 89). It is not a matter of understanding how separate realities are defined: the paradigmatic universe and narrative universe; the right-handed world and left-handed world. Rather, the appropriate task involves employing our psychological sensibilities to understand how the two dance together. That dance, it would seem, is the reality we seek.

Goodman's Worlds

Vygotsky and Bruner revealed the important connection between how we think and the properties of our language. To be sure, the characteristics of language influence how humans construct their worlds; yet, many scholars stop short of describing how construction occurs. Are there general processes that can be identified? In *Ways of World Making*, Nelson Goodman (1978) does just this. Goodman provides convincing philosophical arguments for the necessity of narrative reality (actually many realities, or worlds, none more real than the other) and a self defined through narrative. Though his rich description could be used to inform most discussions on narrative, it is Goodman's conceptualization of the processes of narrative construction that are particularly important for this discussion. As his title suggests, Goodman describes for his readers ways in which worlds are built. Early in his book, Goodman outlines five components of world making: *composition* and *decomposition*, *weighting*, *ordering*, *deletion* and *supplementation*, and *deformation*. Though this list is not inclusive, it does provide an

excellent framework to understand the general nature of a narrative reality. Each process will briefly summarized.

Composition and *decomposition* is the process of "taking apart and putting together, often conjointly" (Goodman, 1978, p. 7). These two process work as opposites; through composition we combine members and subclasses and form general connections, but through decomposition we divide wholes into their parts. Though they work in different directions, composition and decomposition are complementary processes which form the basis for labeling. For Goodman, human beings often bring "temporally diverse events" together under the umbrella of a label (composition), and also decompose other received labels in their world making activity.

Goodman argues that individuals encounter worlds consisting of common components, but due to different categorical schema, they emphasize different "relevant kinds" creating different worlds. This is the process of *weighting*. Given his appreciation of art, it is not surprising that Goodman uses artistic works in many of his examples. Artists may choose similar subjects, but create drastically different paintings due to their unique points of emphasis. Humans do not, or perhaps cannot, stress all "kinds" equally because to make everything meaningful is to make nothing meaningful. "Just as to stress all syllables is to stress none, so to take all classes as relevant kinds is to take none as such," wrote Goodman (1978, p. 11).

A related process to weighting is what Goodman identifies as *ordering*. In organizing our experiences and encounters with the world, human beings ascribe to collectively accepted ordering systems that aid in providing order to the world. Examples include how we measure weight, distance, and time, the organization of music (scales and

notes), the structure of information (text on a page read from right to left, top to bottom), and the measurement of time (decades, centuries, minutes). Ordering influences how we perceive the world around us, and it differs based on context and culture. These are not "natural" kinds, but are imposed culturally on the world. As Goodman (1978) explains, "Whatever else may be said of these modes of organization, they are not 'found in the world' but *built into a world*" (p. 14).

Making a world often "involves some extensive weeding out and filling – actual excision of some old and supply of some new material" (Goodman, 1978, p. 14). This is the process of *deletion* and *supplementation.* Goodman explains that as humans encounter a world rich in parts, process, and proprieties, humans delete the details and supplement their own perspective into the remaining fragments of perception. For Goodman, the human "capacity for overlooking is virtually unlimited" (p. 14). Again, he uses artists as an example of filtering out and adding to a perspective. To his familiar examples in art, Goodman adds the work of scientists, are "no less drastic, rejecting or purifying most of the entities and events of the world of ordinary things... (p. 15). Such examples emphasize the intentionality of this method of world making, but in most instances, deletion and massive supplementation are better understood as a subconscious processes. For example, the notorious unreliability of eye-witness testimony is a long-standing testament to deletion and supplementation. In describing "what happened" at a crime scene or accident, witnesses frequently and ruthlessly edit details, overlooking some and adding others.

The final member of Goodman's list of world making processes is that of *deformation.* Changes to perceived events and elements may include their reshaping or

deformation. Like deletion and supplementation, deformation changes the nature of the experience. It is best understood as a distortion of life experiences, such as a physicists who "smooths out" data to make it confirm to her theoretical curve. In world making, we may bend the properities of events, objects, or experiences that reside in our memory to create a world more congruent with the one we expect. As examples, Goodman raises the results of perception studies, which conclude that humans extend the length of a line ending with an arrowhead point in and shrink a physically equal line which offers arrowheads pointing out. It is the mind distorting a physical reality.

Goodman was sure to emphasize that these five processes were not the only ways of world making, or even the right ways for all people. Others in narrative psychology employ a slightly different vocabulary to describe some of the same processes as Goodman. Shrag (1997) describes how an individual "emplots" herself in stories-in-the-making as an act of self-constitution. This is one way of describing the process of narrative. As Shrag's use of the word "emplotting" indicates, it is not the world acting upon the person, but the person who acts upon the world through narrative. We cast ourselves as the protagonist during the chapters of our life story, and the need for cohesion is paramount. Emplotment can effect how we respond to social interaction as well as how we construct a story. Bruner (1991) explains emplotment as "coherence by contemporaneity," and provides an example from his own experience of writing the story of his autobiography:

> I made the wry discovery, writing my own intellectual autobiography several years ago, that once I had discovered in the New York Times Index what else had been happening at the time of some personal event, I could scarcely resist connecting the lot into one coherent whole – connecting, not subsuming, not creating historical-causal entailments, but winding it into story. (p. 19)

Bruner continues to explain that through this same process, humankind has continually worked to organize our common experiences by imposing well-structured stories. This is how we came to "invent" the Dark Ages, "making everything all of a piece until, finally, the diversity becomes too great and then we invent the Renaissance" (Bruner, 1991, p. 19). Repeating this process has created a unified, well-structured theory of world history. Bruner's observations draw parallels back to Spiro's belief that most knowledge systems fail to recognize the inherent complexity of most knowledge domains, such as history. Demonstrating their "reductive bias," many instructional perspectives reduce knowledge to unrealistically simplified, well-structured domains (R.J. Spiro, Feltovich, Jacobson, & Coulson, 1992). Although Spiro's work is grounded in a different context, I still believe it fair to extend the label "reductive bias" to each of us, as *Homo narrans*, for creating well-structured, narrative accounts of the world. By filtering our life experiences through our narrative sensibilities, it is possible that we consistently maintain certain inaccuracies in an effort to retain intellectual coherence.

We Are Stories in the Making

The preceding overview should give some indication as to the theoretical momentum that has given us a narrative construction of reality. Through a variety of mechanism, a number of sharp thinkers have revealed a fairly intuitive conclusion: human beings tell stories, those stories are an act of construction, and such stories constitute a psychological reality, a "world" in Nelson Goodman's (1978) vocabulary. Later in the chapter, I will depict world-making behaviors on the Internet, but before I do, I must elaborate the development of identity. For many scholars, stories not only make worlds, but also define "the self." It is this "storied self" that I will explore presently.

If we accept the notion that realities can be created through stories alone, it is a short distance to the conclusion that they also inform the development our own identities. There is a substantial body of research on personal identity, involving the likes of Erik Erickson (1963, 1968), among others. The most diligent researcher of the storied self is Dan McAdams (1996), who argues that stories are the building blocks of identity. They are used to organize a potentially chaotic experience, providing the mind with parameters and direction. Stores are like "psychological glue" which hold the identity in-tact from the deconstructive forces of modernity (Thorne & Latzke, 1996). The storied self is different from the other selfs, such as the rational self. As Heilman (2005) explains, "The storied self differs from the rational and staged self in that we have plot to go with storied self. It is not a label, affiliation, set of beliefs, a stage or a category, but rather a narrative" (p. 125). As a narrative, the storied self provides a plotline with which to organize one's self psychologically. In its organizing activities, it is both reductive and generative.

Even as we discuss narrative, reality, and the self, it is difficult to separate the three, for they seem to work together. Narrative is the tie that binds, forming a reality built on the identity of a storied self. This activity has been documented and described by psychologists for many years studying humans across the span of life. Leveraging stories as a sense-making activity is particularly important for those that use the Internet the most – children, adolescents, and emerging young adults. Narrative begins early as an organizing principle, as "children often spill out the events of the day to caretakers as they are going to sleep, seeking meanings for the jumbled happenings of the day" (Thorne & Latzke, 1996, p. 372). More evidence of a storied self emerges as children

become adolescents. Dan McAdams (1996) suggests that adolescence is the beginning of the *narrative era*, a time in which human actors begin to construct their own story. Fundamental to this narrative era are questions of identity. Adolescents in their teenage years struggle to define who they are and what they will become. "Modern adolescents are expected to struggle with the ambiguities of their new ontological status," writes McAdams (1996, p. 311).

In his exploration of egocentrism in adolescence, Elkind (1967) describes two mechanism, the "imaginary audience" and "the personal fable," that aid youth in organizing their experiences through the construction of stories. Elkind argues that adolescents tend to believe that in any social situation, they are the center of attention. Young people anticipate the reaction of others as admiring or as critical, depending on how they feel about themselves. Through their daily activities, adolescents are "continually constructing ... an *imaginary audience*" (Elkind, 1967, p. 1030).

The *imaginary audience* is complimented by another psychological construction described by Elkind – what he calls the *personal fable*. As each adolescent prepares herself for her imaginary audience, she comes to feel that her place in the world is *unique*. Because she is important to so many people (including her imaginary audience), she comes to regard herself as set apart, special, or different. Internally, she begins to construct a story, a *personal fable*, about the drama around her life.

Narrative, through personal fables and imaginary audience, is an important mechanism for teenagers to find their sense of being, and the technologies that form the Internet are often accessible, convenient, and conducive to narrative identity construction. Sharing through and surfing on the Internet helps teens and young adults find identity

closure through its various narrative technologies, tools used to technologically construct the storied self and make sense of their evolving sets of experience.

To summarize, implicit in the creation of a narrative reality is a storied self. Both mechanisms are employed to order the universe and build psychological coherence, even at the expense of contradictory events (Garfinkel, 1967). Stories help "people define what is salient about their lives, what differentiates them from others, and how they might make choices" (Heilman, 2005, p. 125). I hope to illustrate in the remainder of the chapter how the Internet is a medium of social exchange uniquely positioned to strengthen personal narratives. Put another way, I will argue that the structure and experience of the Internet is uniquely narrative.

The Internet's Narrative: Surf, Share and Submerge

This survey of scholarship is meant to have provided some clarity in the development and meaning of narrative realities and the storied self. As a mechanism for ordering experience, narrative is an instrumental element of the human mind, even as we cross cultural borders. Yet, scholars have yet to extend this understanding to technologically mediated spaces, such as the Internet. I wish to cross a new border bringing the world of narratology and the world of hypertext together.

When I refer to the narrative sensibilities of the Internet, I believe that such activity can be divided into three separate, but related activities: *surfing*, *sharing* and *submerging*. *Surfing* includes those actions that generally do not add information to the Web for those to stumble across. Surfing is the root metaphor for the activity of the Internet, and includes general web browsing and searching the Internet. The unique properties of the Internet amplify our narrative sensibilities, gifting us with a form of

media that promotes agency for the individual. This agency is rooted in hypertext and forms an instrumental component of the Internet's narrative backbone. The second, and equally important category, is that of *sharing*. Sharing through the Internet embodies those Web-based activities in which users leave personal records, prose, artifacts, and ideas for others to find. More often than not, sharing is conducted through Web-based social networking technologies such as *MySpace*, *Facebook*, *Friendster*, *YouTube*, and of course, blogs. Through these platforms for self-publication, Internet users actively construct their lives through the words and images that they publish. The third and final category is that of *submerging*. Some Internet websites, applications, and environments offer immersive opportunities for users to (re)define self and change the building blocks of their life narrative. *Second Life, World of WarCraft, habbo hotel,* avatar-oriented chat, and to a lesser extent text-based chatrooms and dating sites are technologies which may submerge the user in opportunities to explore identity. All three dimensions of a narrative Internet – *surfing*, *sharing*, and *submerging* – work together to make for the storied nature of the Net, one in which users reconstruct their life stories, their sense of self, and their worlds.

Surfing: The Narrative Structure of the Internet

Surfing the Internet is a phrased coined by Jean Armour Polly in 1992 to describe the regular activity of the Internet. It implies that the Internet is a sea of information that the savvy user skillful rides, seeking the edge of the "wave" where her interests meet the available sources. Such a description often implies a research agenda for most Internet users. In her article "Surfing the INTERNET," Polly (1992) provides such a description. She downloads antivirus software, scans databases for information, reads news and

weather reports, and forwards information to friends. This leads to the assumption that users approach their Internet activities like objective scientists, performing research characteristic of the paradigmatic form of thinking. While research represents an important part of surfing the Internet, it is not exclusive to paradigmatic thinking. Often, surfing the Internet provides material for the stories of our lives.

As users *surf* the Web, they often experience it as a story, one in which they co-author as they surf. The structure of the Internet is one of agency, and allows users to not only receive stories (as in conventional media), but to product them through the combination of their own imaginations and the hyperlinked structure of the Internet. As John Seely Brown (2000) observes, "A key understanding is that on the Web there is seldom such a thing as just a producer or just a consumer; on the Web, each of us is part consumer and part producer. We read and we write, we absorb and we critique, we listen and we tell stories, we help and we seek help. This is life on the Web" (p. 20). This is primarily where the experience of the Internet is fundamentally different than other forms of media, particularly television and movies.

As we watch television, we view a broadcast, a single story intended for a large audience. As we watch the program, we take in the facts, events, and characters as they are presented and draw conclusions based on the available information – did he commit the murder? Will my favorite TV couple get back together? Was that funny? No matter the genre of broadcast media, a user's experience is one of receiving information and making decisions based on the presented information. It is broadcast – one storyline, same characters, same sequence – no matter who is watching, how old they are, how they feel that day, or what they preferences happen to be.

Television has a single organizing principle, what pioneering media critic Raymond Williams (1992) calls "flow." In order to retain viewers and limit channel surfing, TV networks engineer their programming around preserving the fluidity of the experience, or flow. Consequently, it is important for transitions from program to commercial to program to be smooth, subtle, and harmonious. The irony of flow is that television studios have found that the best way to achieve the highest levels of viewer engagement is by chopping a plot "into short sequential bursts, each with their own simulacrum of a microplot... the goal is to create an unending series of reversals, moments of ecstasy and anticipation, which then may be usurped by the commercial" (Berndt Ostendorf cited in (Gitlin, 2002, p. 109)). When flow is achieved, viewers lose themselves in the moment and are absorb in the program's plot. For TV, it's about their story – not yours.

The Internet's open structure presents a far different experience. If the experience of television is flow, the experience of the Web is one of agency. In TV, programming is pushed onto the viewer. Though you can change stations, channel surf, and TiVO, your choices are limited. Hence, in order to make the experience compelling, flow is needed. Viewership must be continually distracted as a way to compensate for television's passive form of narrative. The Internet, however, introduces agency into the experience. With the user at the controls (at least experientially), flow is replaced with flood – a glut of possibilities, a tangled mess of plotlines. Rather than receiving static programming as in television, when we surf the Internet, we make our own program through our interests and whims. Each experience is individualized, surfing through the pages of the Internet as we construct a cohesive narrative. For a student, this may be

researching a project; for a retiree, this may be constructing a trip itinerary. Even in daily surfing, the interconnections and criss-crossing landscape of the Internet structures an experience that is narrative in its orientation – we scroll through possible news stories, we follow links inside the stories, we "google" for more information, we email the unusual or the interesting to a friend. Click-after-click this is how we come to experience the Internet.

The Internet is a unique medium because we both bring our narrative *to* the Internet and we form our narrative *with* the Internet. Consider a list of queries from the recently released AOL database of search activity. This database provides a glimpse into the search behaviors of over 650,000 AOL users from March 2006 to May 2006. As we examine part of the search trail of one AOL user, we see that he is struggling with the realities of divorce, finding housing, gaining custody of his children, and resuming single life:

charlton ma apartments
gourmet condiments
cheer up plaques
mass custody definitions
kids health
wastewater jobs mass
visitation schedule
kids gym places in worcester
mass wastewater certification exam forums
counter surveilance products
sample visitation schedules
how are fat girlfriends
salem probate court decisions
revenge for a cheating spouse
civil war a fathers guide to wining custody
mass licensed daycare providers
fish chowder recipes
win your child custody war books for sale
martindale hubbell
first date dos and donts...(McCullagh, 2006)

One can see that this man brings his own story to his Internet experience. Rather than drowning his troubles, sorrows, and vengeful feelings in television, he seeks a different experience through the web – one in which he constructs, a place where he can find answers, improve his condition, and move forward. Notice that his narrative is multifaceted, and complex; his search ranges from queries on kids' gyms, to career information, to counter-surveillance technologies. In the same search trail, he seeks both revenge on his cheating spouse and a good fish chowder recipe. Only the Internet would allow the freedom to pursue such a disjointed story. As such, our Internet narratives resist what Bruner (1991) called "automatized interpretations," which are "comparable to the default settings of a computer: an economical, time- and effort-saving way of dealing with knowledge" (p. 10). Rather, the open architecture of hypertext offers a build-as-you-go plotline. The Internet surfer determines the direction of the story – custody battles or dinner recipes. Thus, the Internet's narrative quality is a function of the Web's architecture.

In *Small Pieces Loosely Joined*, Weinberger (2002) argues that developing an appropriate understanding of the Internet includes differentiating the role of time on-line versus time outside the Internet. In creating a theory of time for the Internet, he makes the following observation:

> The Web, on the other hand, reminds us that the fundamental unit of time isn't a moment, it's a story, and the string that holds time together isn't the mere proximity of moments but our interest in the story. (p. 59)

Weinberger arrived at what I have taken much longer to develop, that surfing the Web is at its core, a story. This story is constructed differently for everyone who uses the Internet. For some, the story is a nightmare, a terrifying adventure into the unknown.

Unable to place their experience in a physical context, or associate a name with a face, surfing the Web is like walking blind-folded through a foreign country. I think of the analogue generation, the digital immigrants who approach their Internet journeys with caution. The stories they tell are seeded with uneasiness and uncertainty. Along their trip to buy a book at amazon.com, strangers may approach them through the form of pop-up ads, offering them products or telling them they've won a prize. Like visitors in a foreign land, they are disoriented to their surroundings, fearful that with each click they may "crash" their computer or have their personal information stolen. The influx of spam complicates matters for such novice users. "Who are these messages from, and how did they get my email address?" they may ask. What the web savvy may consider an annoyance, the analogue generation understands as a threat. Not surprisingly, the convenience of the Internet to purchase products, locate important information, or research problems is often not enough to keep the digital immigrant. They may prefer to drive across town to shop at the bookstore at the mall, stay up until 11:00 p.m. to see the next day's weather forecast on the local news, or thumb methodically through the yellow pages for the phone number they can't seem to remember. In short, they trade convenience for familiarity.

Fearful stories of the uncertainties of the Internet, like those of many digital immigrants, form a stark contrast with the experience of adolescents and young adults, who generally embrace the Internet technologies (over 80 percent of 18-29 year olds use the Internet ("Demographics of Internet Users", 2006)). Rather than being cautious about the unknown, adolescents revel in the ambiguity of on-line domains. It would seem that the Internet has the necessary bandwidth to maximize the social capacity of adolescents.

Rather than restricting their conversations and stories, the Internet allows for multiple conversations, organized asymmetrically, centered on the whim of the user. It does not force what Bruner (1991) characterized as "narrative necessity," a single interpretation of a story (much like a logical necessity) (p. 7). It is probably no coincidence, then, that young users of the Internet have made *sharing* websites including MySpace, Facebook, and YouTube some of the most heavily trafficked sites on all the Internet.

Sharing: Narrative Technologies on the Net

Sharing through the Internet is one of the most popular activities in the online realm. MySpace, Facebook, and YouTube – three popular ways to share on the Internet – are all estimated to be in the top ten most popular sites in the United States ("Top Sites United States", 2007). *Sharing* technologies represent opportunities not only for Internet users to share information or connect with other like-minded individuals, but they also represent the *practice* of the narrative construction of self. Through *sharing*, Internet enthusiasts (often adolescents and young adults) actively compose a life story to presents to others whom they may be friends with or do not know. In describing this phenomenon, I begin with one of the most popular ways to share on the Internet – the blog.

The term "blog" is short for a web log. Like mathematicians, Internet enthusiasts often seek for concise terms of description. Blogs can be a lot of things – opportunities for political advocacy, online personal diaries, sources for news and topical information, and even reviews of the activities of other blogs (blogs about blogs, or *metablogs*). Although the purposes of blogs may vary, in most cases, their use is distinctly narrative. Frank Paynter (2004) posed the question to the general blogging community, "Why do

you blog?" The answers ranged from the sarcastic ("to make money and meet women") to the philosophical (with references to Socrates and William of Occam). Moving past the intellectual bravado embodied in many of the responses, several stood out in their acknowledgement of the narrative possibilities of blogs. In particular, one blogger reflected back to her childhood, and in doing so, captures the storied nature of the Net:

> I remember sitting in the hallway floor as a kid, listening to my mother and her friends talk in this 1940's kitchen. They would connect about everything over tea and sometimes a martini -- their children, their husbands, Vietnam, politics, whether they should get a part time job. They would chat about the neighbors, community support programs, family get togethers, the church where they volunteered or the annoying woman in town who just joined their Bridge Club. I'd listen eagerly and later, go find where the men were hiding out, only to discover that they were watching a sporting event on TV....and barely talking at all.
>
> I think of my blog like I do my mother's kitchen, which was warm and inviting. I vividly remember the colors, the smells, the texture of the carpet, the soft yellow walls, the faces and personalities who passed through over the years, the left out pie on the counter after a gathering.
>
> We all had a favorite room we retreated to as a child and today, as an adult...you know, the room where we go to disappear and just be ourselves. When I log on, I'm entering one of my favorite rooms, a place where I can think, express, be myself just like the women in my mother's kitchen (Paynter, 2004).

Blogs and other "sharing" technologies of the Internet provide their users unique narrative opportunities to express and construct the *storied self.* The blog is a place of self-expression and self-definition, and more often than not, bloggers leverage hypermedia to form their stories in novel ways. While bloggers blog for many reasons, at its core, blogging is about expression of voice and self. A software engineer named Dave Winer, who keeps what he claims as the longest running blog on the Internet (started in 1997), has argued that at its essence, blogging is about "the unedited voice of a single person." Bloggers use their blogs as a regular opportunity to define the boundaries of the self. They commonly seek to create a strong blogging personality. Blogger "Vaspers the

Grate" (a.k.a. Steven Streight (2007)) advises those that blog to look to their activity as an opportunity of self-definition:

> You're 'the _____ that _____". Fill in the first blank with who you are, what you do, what type of person you seem to be. Fill in the second blank with something special about you. Something that might even seem incongruent or absurd, when connected with the first fact about you.

Streight gives examples including: you are "the math teacher who's also a mountain climber and an author of children's stories" or "the marketing director who is also an amateur astronomer." Streight's musings on his blog implore bloggers to find what is special and unique to them and build their web personas around this idea. Like Peter Steiner's now infamous cartoon in *The New Yorker* ("On the Internet, nobody knows you're a dog"), blogs present the opportunity to define your self through the story of your choosing. Streight's advice for his readers is simple: of all the stories you could tell, be sure to pick an interesting one. Fail to do so and your online persona will drown in the sea of fifty-million other blogs.

As Streight's post reveals, blogging is the virtual representation of the psychological you. You are publishing more than just your ideas, your opinions, or what you find interesting, compelling, and provocative. You are publishing yourself – your story, written and acted by you. The process is fairly intuitive: imagine your self and your story (the collection of attributes and events that make you who you are) and develop a web-enabled version of them. The beauty of this activity, as it is for all opportunities to define self through publishing stories, is that you can be intentional about who you are and what your story is. As Streight (2007) concludes, "What makes you 'you'?...Whatever it is that makes you special, sprinkle it into your blog more often. This is how you develop and display a strong blog personality, or blog persona."

Blogs are certainly not the only publication technology that has broad implications for a narrative construction of reality and identity. Some of the fastest growing technologies on the Internet – the highly lauded "Web 2.0" social networking sites – are story-making machines that amplify the narrative-orientation of human psychology. Through the power of the Internet to reach an audience – real or imagined – users leverage the Web to define themselves and their world.

Consider some of the most popular sites on the Internet today, such as MySpace and FaceBook. Such "social networking" sites provide users with tools by which they can stay connected with friends, find old acquaintances, and meet new people. In the process of creating their online profiles, MySpace and FaceBook users actively define themselves in a way rarely done in the real world. In creating a social networking presence, MySpace and Facebook users must consider a number of questions that define the boundaries of their online self: "What are interests, my favorite music, books, tv programs; who are my heroes, what are my religious and political views, what phrase defines me, where I am headed, where have I been?" Such questions may be reduced to a single question, "Who am I and what is my story?" Am I fun loving, serious, cosmopolitan, uniquely parochial, mysterious, candid, reserved, introspective, or out going?

Creating an account at one of the many social networking sites on the Internet is an act of self-definition in which the member must actively construct their life story. To aid in this act of narrative construction, FaceBook offers "story tools" to accompany their members' online profiles. These include relationship stories, group stories, event stories, photo stories, friend stories, status stories, discussion stories, and more. Such tools may

be used to chronicle life events, changes in perspective, and the evolving image of self. Most importantly, they predispose the Facebook member to find a sense of self through stories.

The use of the publishing potential of the Internet to express personal identity did not originate with the Web 2.0 tools like blogs and social networking sites. Certainly, the very activity of creating a personal website (a mainstay of Internet activity since the dawn of the Web) is a form of identity expression through hypernarrative. However, the new publishing options available via social networking sites have made sharing on the Internet more popular than ever – and with it story making. As I have already argued, even if those who frequent the Internet never publish, the experience of using the Net for research and personal interest is inherently narrative. The substructure of the Internet evokes a narrative paradigm. The very activity of surfing is story construction, one in which the Internet user combines plot points from her life with the elements of the Internet. In the next section, I explore the third and final narrative form common to the Internet, that of *submersion.*

Submersion: Where the Virtual Is Pretty Real

Of the three "dimensions" of a narrative Internet I have proposed (*surfing, sharing,* and *submerging*), the obvious choice was to begin with surfing. After all, it is the most basic of the three, and may likely allow for the possibility of the other two. Yet, I was tempted to lead with the analysis of *submerging* because it has been the most thoroughly discussed and most explicitly narrative of the three. *Submerging* technologies are those I described in the chapter introduction. They are the virtual worlds in which participants build avatars and personas to surround them and engage a persistent alternate

reality. In some ways, their popularity with researchers makes them less interesting for academic study; yet, given *submerging* technologies explicit connection to narrative, world making, and identity, the topic cannot be ignored.

There is a growing body of intensive research of psychological and social submersion common to these virtual worlds including Sherry Turkle's (1984, 1995) groundbreaking work *The Second Self* and *Life on the Screen*, Julian Dibbell's *My Tiny Life* (1998), Patricia Wallace's (1999) *The Psychology of the Internet*, Eileen Green and Alison Adam's (2001) collection *Virtual Gender: Identity, Consumption, and Technology*, and more recent works such as Edward Castronova's (2005) *Synthetic Worlds*. These volumes explore in detail the psychological, social, and economic significance virtual worlds may have for their users. For the uninitiated, I will describe some of the more important features of *submerging* technologies by joining those abuzz about *Second Life*, the most popular and authentic of the virtual worlds.

Apparently, academic types enjoy observing the mix of self exploration and fantasy that the anonymity of the Internet allows, particularly what is found in persistent alternate worlds like *Second Life*. This enthusiasm is not unwarranted. I introduced the chapter with statistics about the popularity and features of *Second Life* because this application represents the most recent and successful of a series of virtual worlds including *World of WarCraft, Ultima Online, EverQuest, Mu,* and *Legends of Mir*. Many of these are "games" in that there is a quest, objective or goal that serves as a master narrative for its participants. With a plot imposed on the environment, there is generally less experimentation with identity and narrative, though players still build characters, form clans, collaborate with others, and developing unique online identities.

More important to this chapter are environments like *Second Life* or *There* which offer no identifiable plot, storyline, or game objective; rather, the goal of these "games" is to create an alternate universe, an online world where residents are free to experience it in whatever way one chooses. Such flexibility makes for an enormous amount of diversity in activity and expanded possibilities for narrative and identity. As the CEO of the company that created *Second Life* (Linden Labs), Philip Rosedale, said of his work, "I'm not building a game. I'm building a new country" (Sussman, 2006).

What allows environments like *Second Life* to submerge their "citizens" into an enthralling experience is the replication for an alternative world for residents to participate in. As its title describes, *Second Life* is a robust, lively, and very real existence for users. On *Second Life*, you can do just about anything (as long as you respect others): purchase or build a house, make friends, attend events, get a job, have sex, attend debates, shop, enter contests, or just sit and "people" watch. Perhaps this is what I find so surprising about Second Life. It's not that you can do everyday tasks; it's that the residents would want to.

The reason for employment in *Second Life* is to earn currency, called Linden Dollars, which are tied to real world currencies. The economy of *Second Life* is complex, but in short, there are certain things that many residents try to acquire to enhance their *Second Life* experience: enhancements for their avatars (custom clothes, skins, body parts, animations), nice homes and good land, furnishings, vehicles, and other luxury items. To acquire these goods, one can buy them with Linden dollars they purchased using their credit card (a income stream for Linden Labs), buy them with Linden dollars they earned by working (from professional dancers to professional builders), or learn how

to make the items themselves. In rare cases, residents of *Second Life* have supported themselves in real life solely on the money they make in that world.

At the center of the *Second Life* experience is socialization. *Second Life* is supposed to be a party, complete with casinos, dances, clubs, mixers, and "mature" events. The cornerstone of all social activity is the avatar. Each resident manages at least one (but often more) avatars or "AV" which carry a name and custom-designed physical attributes. The design of the avatar and the behavior of the resident represent the richest source of data for the cyberpsychologists. Both in how residents design their avatar and how they act in this virtual world is the basis of much discussion and debate. For example, do people who enter *Second Life* build an experience that is an extension of their "primary" (the term to describe the "you" in real life)? Or is *Second Life* an environment of exploration of the self, a world of fantasy and imagination?

With a collection of residents as large as *Second Life (SL)*, it should not surprise us that identity in this virtual world is a blend of the extension and adaptation of the self. Some residents use *Second Life* to construct a different story about themselves and their life. It is a narrative experience that is intentionally separated from their real lives (RL) – though, residents may identify more closely with their avatar than their primary. As one *Second Life* resident reflected in the *Second Life Herald* (an online newspaper that covers events in *Second Life*):

> In RL, [I'm] quiet, shy, unassuming, never the center of attention. A total contrast to my SL self. In SL I can let my inner self go and be the person I've always wanted to be, funny, outgoing, the center of attention. SL is my fantasy world where I can be anything...

As these comments reflect, *Second Life* can be a place of social experimentation as personal and social risk are much lower (Giles, 2006). The anonymity of *Second Life*

plus the creative freedom to customize your physical self (in the form of your avatar) allows *Second Life* residents to create an alternative world, an experience that is not reflective of their real life. This is not unlike the participants in Sherry Turkle's (1995) study of MUDs (early text-based virtual worlds on the Internet), one of which responded that "RL is just one more window, and it's not usually my best one" (p. 13). So *submerging* technologies can allow stories and identities far different than those we find in the users' real lives. However, recent research has indicated that it is not so easy for *Second Life* residents to shed their real-world attitudes, dispositions, beliefs, and attitudes. A research group from Stanford concluded that "social interactions in the online virtual environments such as Second Life are governed by the same social norms as social interactions in the physical world" (Giles, 2006). Linden Labs also recently announced that it will sell residents the right to use their real last names (before this development, one had to choose a fictitious last name from a long list of possibilities). When asked in an interview why the company is beginning to offer this service, CEO Philip Rosendale replied in part, "...sometimes people may want to be their real selves" (Terdiman, 2006). Selling the ability to use real names in *Second Life* is evidence of the growing market of individuals for whom their "second life" is a supplement to their first. Second *Life* resident "Gwyneth Llewelyn" summarizes the difficulty shedding our narrative norms in virtual spaces. I quote from her blog at length:

> The question begs asking, and many will dismiss it saying that "I can look like I want in Second Life". Sure you do. But why do 7-feet-tall ogres run for elections and talk like professors? Why does the blonde bombshell patiently train new users in scripting or building? Why does the lady dressed in a Victorian dress organise large groups of volunteers? Why does the guy dressed like Prince Charming flame the world with his bluntness and strong words, acting as a hero of the nation bringing righteousness to SL? The answer, of course, is that we can shed our physical aspect, but it's way harder to shed our mental processes. You'll behave

> in SL more likely like you behave in real life — unless you're a very talented actor or role-player (and sure, these exist as well!). At the end of the day, you'll be stripped off all physical attributes, and will commune with your fellow residents mind-to-mind. So, where is your sense of identity then? (Llewelyn, 2006)

This difficulty of total freedom tainted by the confines of the real world may be summarized by dividing the approaches of *Second Life* residents take to the virtual world into two categories: augmentation versus separation. This categorization is a modification of Henrik Linden's (a handle for a Linden Labs insider) distinction between augmentation versus immersion, which do not quite capture the differences I see. Some *Second Life* resident's augment their real life with their *SL* persona. These are the users that enjoy *Second Life* because it provides for the opportunity to enhance their first life. For them, the emphasis of *Second Life* is on the first word – "second," meaning secondary, subordinate, and supplementary. It is they who design avatars that mimic their reali-life physical appearance and operate in *Second Life* under their real names. The other group includes those that seek separation from their real lives through *Second Life*. They pour their energies into creating an avatar that is who they *really* would like to be in real life, but cannot because of personal inhibition, an immutable sense of self, and social expectation. Their activities on *Second Life* constitute a separate identity – a different name, perhaps gender, personality, attitude, race, appearance, and even species (*Second Life* includes animal avatars and mythical creatures). They may not be able to always keep the two worlds, but there are distinct differences between the two. For the separatists, *Second Life* is a form of escape. For them, the emphasis of *Second Life* is on the second word – "life," meaning a separate existence, identity, and being.

Of course, what is relevant for this chapter is that no matter if residents of *Second Life* can be classified as those who augment, separate, or something between the two, all these forms of interaction only further validate the storied nature of the Net. *Second Life* and applications like it are virtual dramas, and as such, involve unfolding storylines written by the characters who take part in the production. Such an example richly illustrates the connection between narrative, identity, and world making. I end the chapter by proposing how the three dimensions of a narrative Internet – surfing, sharing, and submerging – may work together as world making activities.

Ways of World Making Revisited

In this chapter, I have argued that three activities of the Internet – *surfing*, *sharing*, and *submerging* – combine to form the narrative backbone of the Internet. Their individual effects can be described separately, as I have done, or they can be evaluated as a collection, as I will do. In this final section of analysis, I evaluate combinatory effects of these three narrative dimensions of the Internet through Nelson Goodman's (1978) five components of world making reviewed earlier in the chapter. How well do the activities that comprise *surfing*, *sharing*, and *submerging* satisfy Goodman's five criteria for world making (composition and decomposition, weighting, ordering, deletion and separation, deformation)?

Recall that *composition* and *decomposition* is the process of "taking apart and putting together, often conjointly" (Goodman, 1978, p. 7). They are two sides of the same coin: one the hand, we divide the complex into the simple as to lighten the

cognitive load, but on the other hand, simple events, moments, and impressions coalesce into complex wholes. *Weighting* admits that we cannot stress all relevant "kinds" equally. To make all elements of life relevant is to make none relevant, thus humans selectively elevate some themes above others. Related to weighting is *ordering*, or the modes of organization that pervade a world. Goodman argues that how societies judge weight, distance, time, and structure information are unnatural and arbitrary. *Deletion* and *separation* form the process by which humans filter out elements of an expiring world as they form new ones, and finally, *deformation* admits that humans bend and distort life elements to make them conform into a cohesive world.

Goodman's list can be summarized by saying that humans subtract and add, emphasize and minimize, order and reorder, and ignore or deform the elements of life that comprise their world. To illustrate this activity empirically, I introduce the engaging work of sociologist Harold Garfinkel. While some sociological traditions suggest that patterns of behavior and interaction in society are regular, systematic, and orderly, for Garfinkel, social order is illusionary. He argues society is essentially ill-structured, messy, and complicated, and provides little in the way of universals. In his seminal work, *Studies in Ethnomethodology*, Garfinkel (1967) argues that individuals construct an orderly social world through a "documentary method." People function as social actors, selecting certain facts from a social situation over others, bending presented truths, ignoring inconsistencies in an effort to build a cohesive world view. In one study, Garfinkel examined the documentary method of university students. Presenting his experiment as a new form of psychotherapy, Garfinkel invited students to talk with a "counselor" in a separate room via intercom. Unable to see the counselor, the students

were allowed to ask questions about their personal problems, to which the advisor would only reply "yes" or "no." Unbeknownst to the students, the answers provided by the counselor were completely unrelated to their line of questioning; each answer was generated from a random number table.

Rather than dismissing the therapy session from the inconsistency in the answers provided, Garfinkel found that the students discerned underlying patterns in the advice they received. In short, they constructed a social reality that was consistent with their prior experience and the social context of the conversation and provided the students a sense of coherence and order to the interaction. It would appear that when no order existed in these nonsensical interactions, the students created order and meaning rather than doubt the sincerity of the advice they were given (Poore, 2003). Such is the way of world making. It is taking sometimes contradictory life elements, scattered facts, fragments of perspective, and assembling a coherent world via composition and decomposition, weighting, ordering, deletion and separation, and deformation.

World Making and the Internet

Turning to the Internet, it could be argued that the Internet I have described satisfies Goodman's world making criteria solely on the virtue of the experiences common to *submerging* technologies. Certainly, all of these processes are evident in a persistent alternate world such as *Second Life* and its growing list of competitors. After all, residents of *Second Life* are continually creating worlds through the design of their avatars, houses, shops, and their many social and economic activities. During such intense acts of construction, residents undoubtedly take part in the processes described by Goodman and Garfinkel by merging elements of their own life with the opportunities

found in their *Second Life* to create strange, new real life/second life hybrid. Many of the residents who have written about their experiences in *Second Life* confirm this in their accounts.

World making in submerging technologies like *Second Life* is very explicit, but as popular as these online virtual worlds may be, the most generous estimation of their user base still only represents a small segment of all Internet users. As such, the world-making possibilities of the Internet cannot rest solely on *submerging* technologies. If I am to make an argument for world making on the Internet, I must do so by demonstrating how *surfing* and *sharing* also satisfy Goodman's criteria. I turn to this task presently.

When we *surf* or *share* on the Internet, our approach mirrors that of Garkfinkel's students as we utilize some combination of Goodman's world making activities in our efforts. When we *surf*, we are making worlds *through* the Internet. This implies that we subtract and add, emphasize and minimize, order and reorder, and ignore and deform the information and experiences we have on the Web. Internet users come to the Web not as empty slates, but with distinct life elements in hand – personal histories, calcified beliefs, misconceptions, and relationships. As we encounter a sea of opportunities on the Internet, out of necessity, we discount some and elevate others in accordance with our world-making biases. The human mind cannot stress all information equally and its capacity to overlook is unlimited, which is best illustrated in our use of search engines and the hyperlinked structure of the Internet. Through search engines and hyperlinks, surfing the Internet is an act of selection. It may be that we come to the Internet seeking relationship advice, and in the process, we negotiate our way through search results, picking out some information, discarding others, collecting fragments of perspectives, all

in an effort to build a cohesive whole. Through the structure of the Internet, we augment our perspectives and modify our private worlds.

There is also world making *with* the Internet through *sharing* technologies. Consider the enormous opportunities to reconstitute one's life and one's world as we go online to build a blog site, a *MySpace* account, or upload videos to *YouTube* and pictures to *Flickr*. Each sharing opportunity is a chance to change the story of the user's world, to bend memories and make things fit in a new way. Remember the advice of Vaspers the Grate: when sharing on the Internet, complete the statement, "I am the _____ that _____." *MySpace, Facebook,* and blogging not only represent fresh opportunities to define a sense of self (answering the question, who am I?), but they also represent the opportunity to reshape one's world. Such an act not only reconstitutes the self; it reframes the world in which the blogger lives through weighting, composition, deformation, and separation. Like surfing, the sharing Internet user brings her world to the Internet to remake it, but unlike surfing, the sharing Internet user leaves a record of her world making activities. Just scroll through a *Facebook* member account and you will see the member's friends, her friend's friends, her goals, life history, adventures, trips, failures, relationships – basically, her world.

The Autonomy of the Web

The world making possibilities of the Internet become clear as contrast the Internet with the other dominant media of our day, television. The method of experience of the Internet is one of agency: few things happen without user intervention. Without a click, the whole technology sits idle, like an engine warming up on a cold winter morning. Contrast this with television, whose root metaphor is one of passivity. Turn on

a computer and it will sit there awaiting further input; turn on a TV and it is off to the races, flooding your perception with images, sounds, events – all the things of world making, but the difference is that they are not of your choosing. Unlike television and other forms of broadcast media, the Internet sits waiting for users to make, remake, compose and depose stories, events, and actions. It leaves the agency with the individual, and more than anything, that is what makes the Internet narrative and positions it as an important tool in world making. When we use the Internet, we bring our off-line life elements – our problems, opportunities, relationships, beliefs, attitudes, and outlooks – to the medium to continue composing our world online.

End of the Story

The Internet is a technology known by many names. Some of the most popular include "information superhighway," "global network," and core technology of the "Information Age." There is not anything inherently inaccurate with these descriptions. They properly remind us of the enormity of the Internet, and its importance to emerging knowledge societies and economies. However, as with any description, these names do narrow our understanding of all that the Internet is. A description of the Internet as a body of information shelters us from the storied nature of the Internet.

The Internet is more than a stream of cold, rational facts in the form of 1's and 0's; it is also a collection of social practices. These practices often take a narrative form because of the sensibilities of the Internet – what I have termed its "narrative backbone" of *surfing*, *sharing*, and *submerging* technologies. Even at its most basic level – that of the hyperlink – the Internet is enacted as narrative because of the agency it affords the users. Records of AOL user search histories reveal this. Forms of broadcast media

including television, radio, and books are only narrative in that they provide stories. It is far more difficult for consumers of mass media to make their stories through use of that media.

Throughout human history, from oral storytelling to hypertext tales, human beings have organized their experiences through narrative. As Roland Barthes wrote, "narrative... is translatable without fundamental damage" in a way that philosophy or the natural sciences are not (Barthes, 1977, p. 79). And with each development in technology, from written language systems to the Gutenberg press, narrative has remained an important sense making strategy, one that humans employ to construct their worlds. In this light, the Internet represents a new opportunity, or in Vygotsky's (1987) words "qualitative change," in our quest to make stories out of life elements. It is what Dan McAdams (1996) describes as "narrative opportunity," when he wrote: "Within modernity, furthermore, different groups are given different narrative opportunities and face different narrative constraints...People offer different stories about themselves in different contexts" (p. 307). If anything, the Internet provides a medium for people to offer different stories about themselves in a context very removed from their physical world and local context.

It should be reemphasized that a narrative Internet does not preclude the paradigmatic Internet. Bruner warned against such thinking, and it is fairly obvious that each time we encounter the Web, we do so for a variety of reasons. Sometimes when we surf, we are not trying to modify our life story. Instead, we may just need to check a stock ticker, find movie times and weather reports, or research how to remove moles from our yards. The Internet is a massive information network, and often are interactions

with the Internet are about locating and using this information. This is an exciting prospect for the Web, but it is also a common understanding of the Internet. Consequently, this chapter has emphasized the storied nature of the Net and its importance for identity and world making, so that our appreciation of what the Internet includes is not limited to the retrieval of information.

Jerome Bruner (1991) said of his work on narrative:

> It is only a beginning. My objective has been merely to lay out the ground plan of narrative realities. The daunting task that remains now is to show in detail how, in particular instances, narrative organizes the structure of human experiences – how, in a word, 'life' comes to imitate 'art' and vice versa. (p. 21)

This chapter was written in response to Bruner's call, and though there is still much more that can and should be said about the narrative quality of Internet experiences, I hope to have provided a modest starting point for that conversation – or story. We cannot know where these new Internet narratives make take us, just as those in the Middle Ages could not have possibly predicted the impact the Gutenberg press would have on Western civilization. But like any good story, it is no fun knowing the ending before you begin.

CHAPTER 7
CREDIBILITY AT A CLICK: INFORMATION EVALUATION IN OPEN NETWORKS

> Edmund, who had been looking more and more uncomfortable for the last few minutes, now spoke. "Look here," he said, "I hope I'm not a coward – about eating this food, I mean – and I'm sure I don't mean to be rude. But we have had a lot of queer adventures on this voyage of ours and things aren't always as they seem. When I look in your face I can't help believing all you say: but then that's just what might happen with a witch too. How are we to know you're a friend?"
> "You can't know," said the girl. "You can only believe – or not."
> *C.S. Lewis, The Voyage of the Dawn Treader*

As both a social and technical phenomenon, the Internet has garnered an incredible amount of attention for its potential to transform basic patterns of the human experience. Often, the fanfare for the Web stems around its decentralized design: compared to print media, the Internet has very few barriers to publication and distribution of ideas. Its contributing membership is considerably higher than other forms of media, giving cause to David Weinberger's (2002) description of the Internet as "small pieces loosely joined" and John Seely Brown's (2000) formula that the Web "leverages the small efforts of many with the large efforts of the few" (p. 12). And as a collective project, the Internet has been incredibly successful, and now represents the instantiation of a tremendous amount of communal information. This information – wide-reaching, diverse, and sometimes dubious – can be seen as both a challenge and an opportunity for those that seek to leverage this vast information network. Due to its size and open nature, the Internet may pose new challenges that will stretch information seekers' ability to sort, prioritize, and evaluate the trustworthiness of data. More so than ever before, information is readily accessible, but the price for this convenience is exacted when we contemplate evaluating the information we read on the Internet.

In the article "Trust, Authenticity, and Discursive Power in Cyberspace," Anada Mitra (2002) argues that in cyberspace the first question that should be considered is: Whose voice can be trusted? (p. 27). This is a question focused on determining the credibility of information on the Internet. Though this is a very important question, I maintain as I did in Chapter 4, that the first question of the Internet will continue to be, "Whose voice can be heard?" Still, Mitra's question is one that is critical to any discussion of the value of the Internet. Recent survey research has found that less than half (48.8%) of Internet users say that most of the information online is reliable and accurate (USC, 2005, p. 5). If we do not trust what we find on the Internet, how valuable a knowledge network is it? This chapter takes aim at the growing importance of understanding credibility in open information venues. Of particular interest is the disconnection between how students are taught to determine credibility on the Internet and how such decisions occur in practice. The purpose of this activity is to unify theoretically how users make decisions of credibility with how they approach the complexity of the world around them. In an effort to make my case that credibility decisions are difficult to make from check-list methodology, I will employ Gestalt psychology and Aristotle's understanding of rhetoric – but first I begin by exploring previous constructions of credibility.

Explorations of Credibility

For many scholars working in Internet studies, credibility is often defined as "believability" (Fogg et al., 2001). As we encounter information every day, we consciously and subconsciously discard information that lacks relevance and credibility. Several researchers have explored the different factors that influence such decisions by

using empirical studies. The results of these studies have led to a general understanding of the various factors that influence credibility. Wathen and Burkell (2002) summarize the variety of variables that are relevant to credibility in interpersonal and print media: characteristics of the source (credentials, expertise, aesthetics), the receiver (prior knowledge, interest, issue relevance), the message (content, plausibility, familiarity), the medium (organization, presentation), and the context (distractions). Examining hyperspaces, Fogg et al. (2001) identify five variables that positively impact credibility ("real-world feel"; ease of use, expertise, trustworthiness, and message tailoring) and two factors (commercial implications and amateurism) that negatively affect credibility. What unifies these studies are not the factors they chose to elevate in their examination of online credibility, but the researchers' decisions to compartmentalize credibility. By dissecting credibility into lists of influencing factors, these researchers imply that credibility is a *staged process*, one that is ordered, structured, sequential, concrete, and linear.

Such a position is not only important as we discuss the theoretical importance of credibility and the nature of believability in online interactions, but it also may influence those who choose to speak to the pragmatics of online credibility. Technology advocates who write for a practitioner audience mirror this atomistic understanding of credibility by offering checklists for making credibility decisions. A representative example is found in Gardner, Benham, and Newell's (1999) discussion on teaching students how to evaluate the credibility from sources from the Internet. The authors offer five general categories by which the quality of a Web source should be evaluated: authorship, accuracy, objectivity, currency, and coverage. Each category includes a series of sub-questions to

help guide the students through the evaluation process. More recently, the large testing organization ETS joined with a number of universities to design a "standards-based" information literacy assessment that closely conforms to the Association of College Research Librarians (ACRL) Information Literacy Competency Standards for Higher Education. According to the ETS website, the 75-minute assessment is "a comprehensive test" of information and communication technology literacy (ETS, 2007). Such a test will be used by institutions as "pinpoint specific indicators that identify a student as information literate" (ACRL, 2000, p. 5).

These examples of standards of information literacy reveal how credibility on the Internet can be *constructed.* By constructed, I imply that there is no fixed definition or universal criteria for credibility. Decisions on credibility range depending on context, purpose, and medium, which is particularly relevant for this dissertation. Book credibility is different than Internet credibility. Often examples from information literacy studies include in their formulations of credibility contested terms like "objectivity" and "accuracy," but this chapter challenges the values implicit in such thinking. Credibility criteria are made, not discovered.

My principle argument in this chapter is that credibility decisions on the Internet are not easily reduced to a single approach, particularly if that approach is a staged process or sequence-oriented algorithm that is represented as objective, value-free, universal, and scientific. The problem with a single algorithm in researching the Internet is that Internet is far too diverse a collection of resources, practices, and purposes to be reduced to a small checklist of credibility criteria. Not only do many scenarios on the Internet resist the use of a staged-approach to credibility decisions because of a lack of

specific authorship, purpose, or motivation, but also many times we use the Internet in ways in which the primary question we ask is not one of believability. Websites are created for a wide range of purposes including entertainment, political action, commerce, personal experimentation, fandom, hobbies, research, professional associations, and an innumerable number of other purposes. Each genre certainly requires a different set of expectations when one visits the page. Naturally, visitors of the satirical site *theonion.com* do not step through any process to evaluate the believability of the site for the point of the site is disbelief. Rather than questions surrounding the credibility of a page, a visitor of *theonion.com* decides, "Do I like this? Is this funny? Will I come back here?" So the issues surrounding credibility are specific to particular kinds of sites and particular purposes on the part of the searcher. Even within this narrower band of purposes in site and search, the robust needs of searchers require credibility decision-making utilities beyond that of the academic checklist. The subject of the question, "Is this true?" changes how the evaluation is made. "Is this research article believable?", is different than, "is this person's profile real?"

Given the broad diversity of the Internet, I argue in this chapter that decisions about the credibility of online resources are more likely to be based on intuitive, biased, and personal approaches that are more reflective of the ill-structured nature of the Internet, particularly if the Internet source is not "backed" by a real-life organization with considerable reputation capital like major newspapers and new agencies. Deciding whether an online resource is credible may be more an act of subconscious perception through which the individual relies on layers of experience to build an internal consensus than it is an act of external validation through a checklist of standards for credibility.

Through Aristotle's writing on rhetoric and those that contributed to Gestalt psychology, I will create an argument for "perceptive credibility" as one of the valuable approaches to online credibility decisions.

While I suggest that many who write about credibility in online spaces are theoretically misguided, these studies do represent an important part of the ever-growing field of media literacy. As our existence is increasingly a technological one, becoming critical readers of the Internet and other information sources is a survival skill in an interconnected world – as Steven Johnson (1997) reminds us in *Interface Culture*, "there is no such thing as digital information without filters" (p. 38). While the checklist approach offered by Gardner et al. (1999) and others (Schrock, 1999) can be valuable to raise students' awareness to the importance of engaging free information critically, one may wonder if it is realistic to expect new or even experienced Web surfers to mentally work through a laundry list of evaluative questions each time they encounter a new source of information.

Rather than turning immediately to empirical research to answer this question, perhaps leveraging the tools of philosophy and psychology can lead to an informed understanding of how users approach credibility on the Web. In order to understand the nature of credibility in virtual spaces, an understanding of credibility itself should be reconsidered. Fortunately, at the very foundation of Western intellectual history sits this topic. We will turn back to ancient Greece, where Aristotle provided a detailed discussion of what makes information and people believable, what he terms the study of *rhetoric*.

Aristotle's Rhetoric

Aristotle defines rhetoric as "the faculty of observing in any given case the available means of persuasion" (1356a). For Aristotle, rhetoric is the domain by which a purveyor of information convinces an audience of the quality and credibility of the information. It is the power of persuasion, and as such, is not limited to mathematics, science, psychology, or the social sciences – for "in its technical character, it is not concerned with any special or definite class of subjects" (1356a). Certainly, if Aristotle were still theorizing today, he would not have limited his examination of rhetoric to traditional venues such as speeches or print media. Given that the Internet is capturing a larger percentage of the information and news market ("Internet sapping broadcast news audience", 2000), virtual spaces of the Internet should also be considered.

Logos, Ethos, and Pathos

Aristotle divided rhetoric into three supporting components: the speaker's efficacious application of personal character to add credibility to the message (*ethos*), the utilization of emotions of the audience (*pathos*), and the power of proving something true through persuasive arguments and rhetorical syllogisms (*logos).* Such an understanding of rhetoric finds a comfortable nest within well-structured rhetorical domains – those when the author is known, the context is clear, and purpose is apparent. Examples of well-structured rhetorical domains abound in the world of print media. When reviewing an article, book, or newspaper column, the critical reader can consider (1) the author's personal character *(ethos)* through the known reputation of the author, the author's credentials, and past work by the author; (2) the underlying emotional or persuasive tone *(pathos)*, ascertaining whether the author seems committed to her position; and (3) the strength of the argument *(logos)* found in the publication. Concern of the critical reader

is also satisfied by the perceived level of accountability common to print media. One assumes that authors and publishers alike would not knowingly disseminate spurious information (though this certainly can happen, as in the case of James Frey's (2004) *A Million Little Pieces*). There is an implicit assumption of legitimacy to print media that likely influences decisions readers make when it comes to rhetorical validity.

For thousands of years, Aristotle's basic framework for rhetoric has served consumers and producers of information well. It neatly synthesizes the basic components of believability that are difficult to capture in organized schema. Yet, as effective as Aristotle's rhetorical hierarchy is in well-structured information domains, applying Aristotle's understanding of rhetoric to ill-structured spaces, those where authorship, purpose, and context are nebulous, is where many challenges surface. Because the Internet lacks the same level of guardianship of information that print media boasts, the concrete standards of *ethos*, *pathos*, and *logos* have difficulty finding root. How do we evaluate the personal character and credibility of an author who remains veiled to us? Aristotle thought the character of the speaker/author so important that he argued:

> We believe good men more fully and more readily than others: this is true generally whatever the question is, and absolutely true where exact certainty is impossible and opinions are divided... It is not true, as some writers assume in their treatises on rhetoric, that the personal goodness revealed by the speaker contributes nothing to his power of persuasion; on the contrary, his character may almost be called the most effective means of persuasion he possesses. (1356a)

His position underscores the complications of developing credibility standards for the Internet. This perplexity is at the heart of developing an Internet rhetoric. The problem with formulating rhetoric and credibility on the Internet at the source end of information is that it leaves critical readers of the Internet short on many of the

assessments. If a page is relevant, reads well, and appears well researched, but is not explicit in its authorship, must readers disregard the information?

Comparing credibility online with credibility in print reveals that there may be fewer analogues between the conventional notion of credibility and rhetorical effectiveness of print media and the Web than originally thought. As Wathen and Burkell (2002) comment, "It has been proposed that the Internet combines the broad reach advantages of mass communication channels with the persuasion characteristics of interpersonal channels by allowing for give and take between the message source and receiver." This unique quality of the Internet, the elegant marriage of broad and narrowcasting, is what sets this technology apart from other forms of mass media – radio, television, film, and print media. Yet, it is this strange concoction of characteristics that has created such a stubborn problem in evaluating the trustworthiness of the Web. Never before has it been so easy to mass distribute misinformation.

Such complications do provide sufficient motivation to move past Aristotle's trichotomy of rhetoric, which does little to explicate the problem of ambiguity and credentialing on the Internet. If we do leave the comfortable roost of Aristotle's rhetoric, where do we go? Fortunately, we do not have to go far for more robust solutions to the Internet credibility problem. Once again, Aristotle will be helpful in exploring this difficult problem of framing believability on the Internet through his concept of *style* – the aesthetic presentation of an argument. Aristotelian *Style* will prove an important tool to develop a more precise understanding of an Internet rhetoric.

Aristotle's Sense of Style

In his treatise on rhetoric, Aristotle devoted significant energies to constructing a *style* of rhetoric. He begins by reminding the reader that "it is not enough to know what we ought to say; we must also say it as we ought..." (1404a). This appears to be a point that Aristotle concedes begrudgingly, as he criticizes the need to consider the style of one's presentation and attributes the necessity of style to the "defects of our hearers." In reading *Rhetoric*, one gets the sense that in Aristotle's ideal world, the value of the facts and not their presentation should suffice in persuading an audience. "We ought in fairness to fight our case with no help beyond the bare facts: nothing, therefore, should matter except the proof of those facts," laments Aristotle (1404a). Even so, Aristotle is firm in his commitment to "the arts of language" as he maintains that the way in which something is said has great influence over its acceptance. His commitment is confirmed as he prescribes three guiding questions for the orator or writer who wishes to present more effective arguments. In his first question, Aristotle challenges us to consider how persuasion can be produced from the facts themselves. This demonstrates his bias against style and for "facts." Secondly, he encourages the reader to consider how to set the facts out in language. Do our word selection and their arrangement best support our ideas? Lastly, Aristotle emphasizes the proper "method of delivery." Aristotle recognizes the importance of how we deliver information, and he suggests that presentation is often the determining factor for those that win prizes in "dramatic contests." It is they that consider the "right management" of voice – "of speaking loudly, softly, or between the two; of high, low, or intermediate pitch; of the various rhythms that suit various subjects" – that typically are successful in their endeavors (1404a). This is the essence of *style*.

At the time of his scholarship, Aristotle addresses both old media (oratory) and new media (writing) and sees the importance of *style* for each. And though he certainly could not have anticipated the proliferation of a world-wide network of information, Aristotle's emphasis on the *style* of information is a defining characteristic of an Internet-appropriate conceptualization of rhetoric. Just as Aristotle emphasized how speakers empower their words through volume, pitch, rhythm, and pace, in the realm of the Internet there are many aesthetic variables that serve to comprise its *style*. The "look and feel" of a website is certainly an important aspect of *style*. Does the presentation of the website resonate with what the audience has pictured as credible, professional, and trustworthy information sources? Recall the research cited earlier in this chapter (Fogg et al., 2001) which suggests that Internet sites that are "amateurish" cast doubt on their believability. Certainly, poor quality graphics, gaudy banner ads, and inconsistent formatting of text may throw the veracity of a website into question, but are there specific site characteristics – colors, types, fonts, formats, navigation structures – that web readers find particularly compelling or questionable? There may be, but such a question is beyond the scope of this chapter. Being that *style* is a personal enterprise, it is difficult to elaborate on any general principles of rhetorical *style* that apply universally to all Internet sources. Rather than following the prescriptive tradition of Internet credibility studies, I prefer to lean on Aristotle's use of the metaphor of "scene painting" to anchor our understanding of *style* (1414a).

Aristotle's Scene Painting

For Aristotle, scene painting implies that we should consider our purpose and audience when stylizing our message. As in art, the style of technique depends greatly on

the nature of the subject: "the bigger the throng, the more distant is the point of view: so that, in the one and the other, high finish in detail is superfluous and seems better away" (1414a). No matter the medium – public speaking, poetry, prose, or legal proposition – Aristotle emphasizes painting the scene with the audience in mind. Certainly a legal briefing for a judge would have a style distinct from a lesson on mammals presented to elementary children. In this way, *style* is not a matter of particular rules and specific instructions, but is guided by a single question: is the presentation of this information appropriate for my given audience, thus increasing the strength of my argument and the veracity of my claims? Just as an artist makes decisions about the nature of paint, canvas, and technique based on her subject, so must the public speaker or writer do so for her audiences. It would be nice if Aristotle could have provided specific rules for the different media of his day, but he insists that the discussion cannot extend beyond determining the appropriateness of the presentation – "to analyse style still further, and add that it must be agreeable or magnificent, is useless" (1414a). Thus, effective presentations of information on the Internet cannot be guided by specific rules universal for all sites and all viewers; rather, effective websites must create an atmosphere of credibility by *painting a scene* of credibility that is appropriate for its audiences.

Assessing the Internet with Scene Painting

The differences of scene painting on the Internet reveal themselves through both the genre of websites and the type of publication technology employed. Certainly, *irs.gov* should have a different *style* than *yahooligans.com*. In its design, *irs.gov* aims to present authority through its disciplined organization, hierarchical arrangement of resources, and use of governmental vocabulary. *Yahooligans.com* is designed to convey

something entirely different – that of a site which is fun, exciting, interactive, and safe for kids. Both sites aim to be believable, but in different ways. Visitors at *irs.gov* should believe they are getting accurate answers to their tax questions. Visitors to *yahooligans.com* should believe that the site is fun, educational, and safe. The differences in purpose of each site change the approach they must take to scene painting.

These same principles hold true if the online resource is created by an individual, such as a social networking member page. Social networking sites are used to maintain or develop their members' social connections. Often, such services are used to stay connected to friends, relatives, and former classmates around the world. Yet, social networking sites are also used to meet people for friendship and dating. Recent reports in the mainstream press detail violence against members of MySpace who unknowingly meet troubled individuals on the popular social network site. Noah Shachtman (2006) of *Wired* magazine reported that, "With more than 120 million registered users on MySpace, odds dictate that some of them will die by violence. The ghoulish, encyclopedic Web site MyDeathSpace chronicles about 600 victims and more than 35 accused, convicted, or executed murderers with MySpace profiles." Even if Internet-linked violence is relatively rare, such situations illustrate another important dimension of online credibility – safety. The question that brings a user to a page may be one of interest or curiosity: "Will I like this person?" and "what are they like?" However, invariably the questions will also become, "can I trust this person?" and "are they lying on their profile?" Not surprisingly, the *style* of personal trust is different than the *style* of a research paper, making evaluation of a profile dissimilar to evaluating a source for a research paper. This example throws into sharp relief the need for additional tools, beyond the typical

"credibility algorithms" to address the ever-growing need for decisions of believability based outside of an informational context.

The differences of technology of publication also create subtle variations in scene painting on the Internet. One such contrast is found in how news information and political commentary are published on the Internet through blogs versus how they are published by conventional media websites like *nytimes.com*. Conventional media outlets extend their print-based credibility practices to their online news sites. In an effort to paint a scene of credibility, they rely on the reputation of their real-world publication, the identification of the reporter, and the disclosure of sources of information (as appropriate). More than many sources of information on the Internet, news sites like *msnbc.com*, *nytimes.com*, and *cnn.com* can rely on the credibility of their real-life organizations for authority. So for most users of the Internet, decisions about credibility become easy when they encounter familiar facets of the regular world online (even given recent problems at the New York Times with fictitious reporting). This makes scene painting for such organizations a matter of replicating their real-world personas.

Such luxuries are not afforded to most of the information found on the Internet, such as most of the blogosphere. Blogs are an enormous source of news information and political commentary on the Internet; yet, bloggers are often unknown and unverified. If they expect their writing to be discussed, used, and shared, then they have a different challenge in creating a credible *style*. The style of blogging is typically more reliant on linking to sources around the Internet, effectively harnessing the power of the Internet to paint a scene of credibility. They write with and through the Web. As they provide their observations of world events, political bloggers often leverage hyperlinks to draw support

from examples around the Internet. Consider this portion of a typical post from political blogger, Arianna Huffington (2007): "Sharpton has also been parroting the lame **"Where's the Beef?" attacks** on Obama. 'We keep hearing sizzle from the media,' **he said**, 'we're not hearing substance.' 'I want to know from Senator Obama where the meat is,' he said on another occasion. And it's not just Sharpton. Columnist Stanley Crouch also took **a few swats** at Obama." The emphasized phrases are links to other resources on the Internet. The style of the blog encourages readers to check references as they assess the credibility of the commentary.

For some, blogging isn't simply a technology for simple publication of ideas, but it is its own style:

> Blogging is also about style. Dave Winer, a software engineer who pioneered several blogging technologies, and who keeps what by his own estimate is the longest-running blog of all (dating back to 1997), has argued that the essence of blogginess is "the unedited voice of a single person", preferably an amateur. Blogs, in other words, usually have a raw, unpolished authenticity and individuality ("It's the links, stupid", 2006).

Bloggers assume a less formal style, but in doing so, often take fuller-advantage of the hyperlinked structure of the Internet. This illustrates how within a genre like news information and political commentary, scene painting on the Internet is very different depending on who you are and how you publish.

Gestalt Psychology

In *Rhetoric*, Aristotle demonstrated the influence of *style* on the different mediums of his day. The case can also be made that *style* is an important characteristic of information contained in new media – the Internet, television, and radio. By resting the nature of credibility on the Internet on an Aristotelian notion of *style*, we have broadly defined how designers of information portals on the Web should approach the

presentation of their sites; yet, we have done less to indicate how Internet users may approach credibility decisions. For this, we must engage in the difficult complications of human perception and with it, Gestalt psychology, a tradition of psychology rising out of early twentieth century Germany that chooses *human perception* as its point of focus.

In the index of Kurt Koffka's (1935) *Principles of Gestalt Psychology* are 23 "laws" that identify the properties of human perception that "Gestalt" (German for whole, shape, or form) psychologists feel fundamental to the human experience. Examples of these laws include the laws of closure, good shape, simplest path, and good continuation. What unifies these laws is a general atmosphere of understanding in Gestalt psychology that seeks to find a holistic rather than atomistic understanding of human comprehension of their environment. "We have not divided behavior or mind into so-and-so-many different functions or elements, each to be studied in isolation," writes Koffka, "Instead we have followed the principles of organization as they become manifest under diverse conditions, starting from the simplest and proceeding to those of higher and higher complexity" (p. 682). Koffka's work signifies an important break from the stance of previous psychological methods that favored an associative understanding of the human mind and mechanistically analyzed the effects of individual stimuli. As Koffka explains, Gestalt psychology represents a break from those in psychological studies who hold to the "constancy hypothesis," which assumes "that we can investigate the whole of perceptual space by examining its individual points separately one by one" (p. 115). Koffka and his German colleagues Köhler (1929) and Wertheimer (1925) were interested in studying the "organized wholes," and expressed a significant commitment to the Aristotelian concept that the whole is greater than the sum of its parts. Put another

way, Gestalt theorists recognized that a collective entity, such as a painting, carries a different meaning than its individual components (canvas, paint, brush strokes, etc.), and they applied such an understanding to the study of human behavior.

Principles of Gestalt Psychology

The holistic position of Gestalt psychologists is best captured by Wertheimer's proposition, the Law of Prägnanz, which states that a psychological organization will always favor those structures that impose the lightest cognitive load. As humans interact with the world around them, they structure their experiences through a biased perception, one that truncates a confused landscape of symbols and subtleties by favoring a number of properties associated with consistency: regularity, symmetry, and simplicity (Koffka, 1935, p. 110). Other scholars have used a similar vocabulary to describe the general bias in instruction and media toward cognitive ease, such as Spiro's (1987) "conspiracy of convenience," Gitlin's (2002) "imperatives of simplification," and Zipf's "principle of least effort"(Chrzastowski, 1995).

Through their study of human perception and behavior, Gestalt psychologists conclude that the human mind employs a number of psychological apparatuses to condense the irregular complexity of physical and social phenomenon to something more manageable, one that is more easily organized. Such apparatuses are described by the many laws of Gestalt psychology. Of particular interest of this chapter are two related Gestalt principles – reification and closure. For Gestalt psychology,

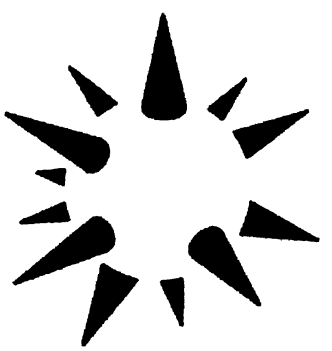


Figure 1. Reification

reification is the perceptual process by which human visual systems produce a more complete and explicit perceptual entity based on a less complete visual input" (Lehar, 2003, p. 392). Consider Figure 1. Experimental psychologists have shown that most respondents recognize the figure as a sphere with cones protruding from its surface, rather than an assortment of cones in space. This figure aptly demonstrates the tendency to perceive a completed whole over an assortment of parts. Our mind's eye chooses harmony over disjointedness. The sphere is perceived, but not present. As this figure shows, reification properly casts perception as a *generative process*.

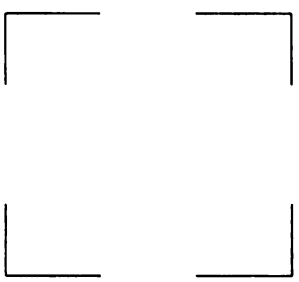


Figure 2. Closure.

Related to reification is the law of closure, an important Gestalt principle for Internet studies. Like reification, closure is a meaning making activity in which our minds add missing elements to an incomplete representation in an effort to produce a more complete representation. In the case of Figure 2, the four brackets do not meet the definition of a square, yet our minds group the four together to complete the entity. Rather than focusing on what is in the figure (four right-angle brackets), it is more likely that we consider what is missing from the perceived square. Through closure humans perceive the experiential whole by observing the parts.

This activity shapes how we encounter our daily experiences with media. Scott McLoud (1994), cartoonist and philosopher, observes that "comic panels fracture both time and space, offering a jagged staccato rhythm of unconnected moments. But closure allows us to connect these moments and mentally construct a continuous reality" (p. 67). Through his illustrations, McCloud masterfully illustrates how readers perceive not only

what happens in the comic frames, but what occurs *between them*. Readers construct a cohesive narrative, and closure is the structural mechanism that allows them to do so. Thus, McCloud values closure as the "grammar" of comics.

Gestalt and the Internet

Closure and reification describe how human perception is instrumental in the construction of credibility in online spaces. As surfers move in and between sources of information on the Internet, they likely encounter a ranging degree of fixed relations with the outside world – such as the author's name and credentials, the institution supporting the site, the purpose behind providing the information, etc. Often some or all of these elements are absent from the online information. How then does the online researcher construct credibility? One solution is to avoid sites that are ambiguous on authorship, purpose, and that lack physical institutions (such as a major newspaper) supporting them; however, such strict criteria would make much of the Internet irrelevant for informational purposes. Doing so would reduce the egalitarian nature of the Internet (if one must be a staffer for National Geographic to write about climate change, then why have an open-access information network?), and relegate sites such as Wikipedia.org to the status of feel-good project with no impact on the information ecology. However, what closure and reification reveal is that human perception is often filling in the gaps of the world that is presented to us. This includes websites.

As Internet surfers encounter information on the Internet, the credentials of the information they encounter are often incomplete. Suppose the author is not known, but the prose of the site is well-written and the aesthetics of the site are professional, polished, and appealing. In such a situation, the Internet user may fill in the missing

pieces to the credibility puzzle through reification and closure. Absent a clear author, visitors to the site generate an author out of the remaining missing elements and thus complete the "square" of credibility. If, however, the site is plastered with banner ads and is gaudy in its presentation, the author the user constructs is far less credible, making the overall "square" of credibility incomplete. Likely the surfer moves on to the next site.

The application of Gestalt principles is a way of describing psychologically and perceptively how Internet users "satisfice" in their assessment of Internet sources (March & Simon, 1958). When faced with the hazy credibility of the thick fog of information on the Internet, most users cannot perform the ideal assessment, but do the best they can given the conditions. The doable job may include generating missing elements of credibility based on what is known about the site – and what is commonly known of every website is its *style*.

Judging Style: Application of Gestalt Psychology

While numerous quantitative researchers have presented empirical data supporting Gestalt principles (Phillips & Craven, 2000; Pomerantz & Kubovy, 1986), it would appear that a holistic understanding of human perception has yet to penetrate the field of Internet credibility studies. This is surprising given the strong emphasis of Gestalt psychology on human perception. Koffka (1935) properly paints the importance of perception in Gestalt theory for his readers:

> Why to the spectator does this actor on the stage look furious or embarrassed or grief-stricken? And in answering this question we must not introduce our knowledge of what he feels, whether he actually experiences the emotions of his part or whether he remains detached or full of glee. Only when we have answered our question can we turn to this second fact and try to explain why in this case our perception was possibly illusory. (p. 76)

Interestingly, the object of Gestalt psychology is not to explain whether what we perceive is "true" reality or not; rather, it is first to describe how our perceptions form. Likewise, one could argue that it is equally important to discuss how Internet users perceive credibility in virtual spaces before we move onto whether our decisions about credibility are correct or not. This chapter aims at doing just that by exploring Internet rhetoric from the other side – what makes information on the Web *appear* credible, for rhetoric is about being persuasive. "First, credibility is a perceived quality; it does not reside in an object, a person, or a piece of information," argues Fogg et al. (2001, pp. 61-62). The authors conclude: "Therefore, in discussing the credibility of a computer product, one is always discussing the perception of credibility." It is easy to see how the optical tradition of Gestalt psychology might frame the perceived believability of websites by paraphrasing Koffka:

> *Why to the Internet user does the web page look so credible or valueless or untrustworthy? And in answering this question we must not introduce our knowledge of the content of the site, whether it is actually composed by conscientious researchers or disaffected students completing a course requirement. Only when we have answered our first question can we address the second task and try to explain why Internet users may be misperceiving the veracity of Internet content.*

Addressing the Incongruency

Gestalt psychology is more than just a helpful theoretical tool to dissect the credibility problem of a decentralized publication space; rather, it also illustrates the incongruency of current Internet credibility theory in the literature today with the complex realities that consumers of information face each day. Such efforts described in the introduction of this chapter often reduce the complex problems of credibility to a list of questions that are often not easily answered in online spaces. Current literature

unnecessarily compartmentalizes credibility in online spaces, confusing human perception as a *staged process*. Scripts, standards, and hierarchies do little for a virtual environment whose defining attributes included dynamic, ephemeral information published by copy-and-paste, cite-if-you-like hypermedia writers. It is not only impractical, it foists upon students a disingenuous representation of the nature of research: "When we try to help our students by making the complex things simple, when we describe mountains as cones and clouds as spheres, we often unwittingly promote hierarchies of value and authority based on oversimplified external signs, not on genuine critical thinking" (Fister, 2006, p. 103).

Equating credibility with its building blocks is to ignore the common contribution of both Gestalt psychology and Aristotelian philosophy to credibility studies – that the whole is greater than the sum of its parts. As an example, journalists understand that writing a traditional news story will likely answer the five w's – who, what, when, where, and why. Yet, it is difficult to imagine that a newspaper columnist would ever agree that the quality of writing can be measured solely by the five w's. This, however, is how the practice of credibility decisions is being framed. It confuses the parts for the whole.

Decisions of rhetorical credibility are not always determined by conscious practices of skeptical contemplation (though it is often framed this way in Internet studies); rather, in everyday surfing, they usually occur during the initial few moments on a website, in what Malcom Gladwell (2005) refers to as "rapid cognition" or perhaps more accurately as Stephen Few's (2006) "rapid perception." These decisions are informed by the multitude of evaluation opportunities humans in today's infocentered world have. Each day we face an all-encompassing swell of information, a land of iconic

plentitude, a "*baffling media totality*" (Gitlin, 2002). Through radio, newspapers, billboards, and especially television, media consumers make thousands of credibility decisions toward media each year. Is it any wonder that users of the Internet transport the skills they are using to make snap credibility judgments about talk radio, political pundits, sales persons, new acquaintances, etc. to the Internet?

Gut and Guess Strategies

How do users, particularly student-aged Internet users, perceive credibility on the Internet? One of the more comprehensive efforts to answer that question found that rules and lists were not part of the perception equation. In a study of the online habits of teens, the Pew Internet & American Life project reports that some teens use a "gut-sense" or "I'll know it when I see it" rubric for evaluating the veracity of information on the Internet. When it comes to evaluating web content, a 17-year old respondent offered that she "think(s) you have to use your best judgment and best guess" (Lenhart, Rainie, & Lewis, 2001, p. 36). Certainly, there are some in media studies who may despair at the lack of criticality embodied in that statement, but if we evaluate our own web practices reflexively perhaps we might recognize that this teenage Internet user has captured how credibility decisions often occur in practice. It would appear that in the ebb-and-flow of Internet surfing, gut-and-guess strategies have much more influence over credibility decisions than rules or algorithms. Should this be a surprise? The use of the theoretical tools presented in this chapter – Aristotle's notions of *style* and scene painting and Gestalt psychology's holistic understanding of human perception – suggests that many times users of the Internet, critical or otherwise, cannot judge a website granularly by working through credibility issues one-by-one. Rather, when the basic tenets of credibility are

unavailable, users must "satisifice" like the respondents of the Pew study who employ gut-and-guess strategies. As Burbules and Callister (2000) comment, "...judgment [on the Internet] is based on indirect inferences about the source's reputation, reliability, and trustworthiness" (p. 73). It is the indirect variables (those not directly related to the "facts") that comprise the *style* of information presentation.

Several thousand years ago, Aristotle (begrudgingly) recognized the importance of *style* in framing an argument. More recently, the quantitative research community, represented by Edward Tufte (1995, 2001) and Stephen Few (2004, 2006) have echoed Aristotle's emphasis on the *style* of quantitative data, what Tufte (2006a) calls "beautiful evidence." But as the Gestalt psychologists suggested, humans reductively *perceive* credibility through a process that favors completeness. It is tools like reification and closure that make surfing a complex, unpredictable domain like the Internet possible, for if we had to judge the information we encountered through set scripts and schema, it is likely that the task of web surfing would be far too daunting. Rather, web surfers may be generative in their judgments as they ignore obvious deficiencies in the rhetoric of the Internet (unknown author, publisher, etc.) and yet still produce a complete judgment as to the veracity of the website. This is reification and closure applied against *style*. It is taking Aristotle's formula – *(logos + pathos + ethos)^style = believability* – and recognizing that on the Internet some of those variables are often left undefined. Like a partial picture, web surfers construct the rest to find completeness. Likely, when teenagers say that they use their best judgment, this is what they mean. They are indicating for us that Gestalt perception of a website's *style* is important when judging websites. For them, it is an intuitive, internalized process – a function of their

environment of media totality. And why shouldn't it be? They have been around the Internet their entire lives; they do not know of life before the World Wide Web.

Gut and Guess Strategies: Implications for Education

Thus far, my primary claim is that in making complicated evaluations of credibility, Internet users justifiably rely on the tools that have served them well in other contexts to manage such demanding tasks. Such tools include perception and intuition, guided by our appreciation for the *style* of credibility. This is not to force a dichotomy between reason and perception; when we use "gut-and-guess" strategies, we are making our "best judgment" and "best guess" by filtering our intuitive evaluations through reason. In a final rhetorical push, I aim to provide one more justification for perception and intuition in Internet studies. In doing so, I take the opportunity to speak to the significance of these ideas for education. Given the importance of information literacy to educators and the rising "knowledge society," any treatment concerning the nature of information literacy should include a discussion of the implications for education.

Klein's Naturalistic Studies

In his extended study *Sources of Power: How People Make Decisions*, Gary Klein (1989) reports that people draw on a diverse set of abilities, or sources of power, to make decisions, many of which are not rational, logic, or explicitly analytical. He argues that intuition and perception are particularly important in *naturalistic-decision making settings*, those situations that can be characterized as having high-stakes, time pressure, inadequate information, poorly defined procedures, and dynamic conditions. These characteristics apply to the natural settings Klein studies, such as firefighting, naval

warfare, paramedic rescues, and weather forecasting, but the premise of his book is that they also describe most settings in which people live and work.

While the Internet is not as sensational an environment as a burning house or a battleship in war, it does meet the demands of complexity described by Klein. Decision-making on the Internet is *time-pressured*, for many workers and students who mine the Internet for information do so with a deadline in mind. Outside of adolescents, few have the time to explore the Web to their heart's content; we need to get on, find what we need, and move on to the next step. The Internet is also, if anything, a platform that offers *dynamic conditions*. The life of information on the Internet changes continually, removing stability and predictability from user decision-making. As such, the Internet places "unusual demands on notions of regularity," making the task of information evaluation difficult (Feltovich, Spiro, & Coulson, 1989). The information we do find in this shifting, fluid space is important to our work, research, even our health, and as such decisions about its veracity should be considered *high-stakes*. Yet, our preparedness to meet the extraordinary demands on the Internet often lack. We meet the challenge often with *inadequate information* and *poorly defined procedures*, or procedures that are well-defined but misaligned to our tasks, similar to Klein's "misguided manuals" for engineers.

So how is it that we survive the taxing cognitive load that these variables introduce in our search for quality information? Through his interview and observational data, Klein (1989) makes a persuasive case that humans often adapt to their environment through their non-analytical abilities, namely *intuition* and *perception*. He writes:

> *Intuition depends on the use of experience to recognize key patterns that indicated the dynamics of the situation.* Because patterns can be subtle, people often cannot

> describe what they noticed, or how they judged a situation as typical or atypical. Therefore, intuition has a strange reputation. (emphasis in original, p. 31)

For Klein, our internal ability to make intuitive judgments from a paucity of data is often due to the human mind's pattern-recognition ability. "Pattern matching (intuition) refers to the ability of the expert to detect typicality and to notice events that did not happen and other anomalies that violate the pattern," writes Klein (1989, p. 149). Clearly, pattern matching is highly dependent on experience to develop expertise. Through pattern matching, we "see inside events and objects" to recognize the depth and subtleties of their field (p. 152). Not surprisingly, intuitive judgments stem from quick, holistic snapshots of our environment. If we saw the world piece-wise, the cognitive load would overwhelm us. We would experience "paralysis by analysis" or qualify as "rational fools" (Ridley, 1996). As Klein explains:

> We would be dazzled if we had to treat everything we saw, every visual input, as a separate element, and had to figure out the connection anew each time we opened our eyes or moved them from one fixation point to another. Fortunately, that is not necessary. We see the world as patterns. Many of these patterns seem to be built into the way our eyes work.... We have other powerful organizers to frame the visual world into Gestalts... (p. 178).

It is easy to see that Klein is convinced of the importance of intuitive judgments based on Gestalt perceptions. While this is well and good, the problem lies in the application of this understanding of evaluation. If we develop our understanding of the world through dense interactions and a wide collection of experiences, how can this be taught to the novice who lacks experience? Klein found that experts have difficultly explaining the subtleties of these internal processes, as they felt compelled to artificially divide their holistic approach to a collection of subtasks. By decomposing complex processes like evaluating the nature of a radar blip (is it an enemy missile or ally plane?)

into a series of steps, experts recognized that the lack of authenticity of the process would lead to further errors. Some researchers have observed that these "stage models" are the most common form of problem-solving mechanisms represented in the research (Lipshitz & Bar-Ilan, 1996). The reduction of complex evaluative mechanisms to systems may fall victim to what Spiro, Coulson, Feltovich and Anderson (1988) term "forms of reductive bias." Spiro et al. observe that often instructional settings falsely reduce the enormous complexity found in ill-structured environments, and impose hierarchical, linear, compartmentalized forms of representation on the subject. This is done to make for easier assimilation for the learner and a more organized delivery of instruction for the teacher, but such actions violate what Jerome Bruner (1977) described as the "scrupulous intellectual honesty" necessary for authentic education.

Teaching Intuition

If reducing complex problem solving to staged models is not always the best course of action for assessing credibility on the Internet, then what should educators do? Perhaps educators should teach multiple methods of website evaluation, focusing some of their efforts to teach students to embrace their intuitive sensibilities. If Internet users often rely on perception to make decisions about websites as they do in many other facets of their life, why not sharpen this tool, rather than presenting means and methods that do not adequately address the wide variety of purposes for assessing content on the Internet?

The importance of intuitive thinking for education is not without precedent. Bruner (1977) recognizes the importance of intuitive thinking in other academic disciplines, such as mathematics, physics, and biology. He says of geometry:

> The point has been repeatedly made that in high school plane geometry is typically taught with excessive emphasis upon techniques, formal proofs, and the

> like, that much more attention needs to be given to the development of students who have a good intuitive feel for geometry, students who are skillful in discovering proofs, not just in checking the validity of or remembering proofs with which they have been presented (p. 56).

Bruner describes the difference between a *real artist of mathematics* and someone who does *paint-by-numbers math.* If we recognize the value of intuitive thinking for what is clearly one of the most valued subjects in the academic canon, why not do so in less prestigious disciplines such as media studies? Bruner argues that one important means of teaching intuitive thinking is by modeling one's own thinking for students. Teachers should verbalize their intuitive problem-solving approaches, giving students confidence in utilizing their own perceptions, intuitions, and internal heuristics.

Of course, in this chapter the question of primary importance is how to describe the mechanisms for assessing credibility in ill-structured, online spaces. It has not been whether actual decisions about the veracity of the sites made by Internet researchers are correct. K-12 education cannot afford such a luxury. The answers do matter, particularly in a subject like mathematics, but even in media studies. Once again, Bruner (1977) provides the proper balance for this dilemma:

> The complementary nature of intuitive thinking and analytic thinking should, we think, be recognized. Through intuitive thinking the individual may often arrive at solutions to problems which he would not achieve at all, or at best more slowly, through more analytical thinking. Once achieved by intuitive methods, they should if possible be checked by analytical methods, while at the same time being respected as worthy hypotheses for such checking. (p. 58)

If we follow Bruner's script, we avoid the unnecessary divide of intuitive versus analytical thinking. The solution for educators is not *either/or*, but *both/and.* In my presentation, I have spent the majority justifying how Internet credibility decisions are made in practice through philosophical and psychological thinking. Yet, I did this not to

privilege intuitive thinking, but to recognize its proper place at the discussion table. Bruner (1977) warns that many look at intuitive thinking as "all àla mode and no pie" (p. 56). As such, it was quite necessary to provide for its defense. That said, Internet credibility decisions can sometimes be verified by analytical means. In their response to the challenges inherent to operationalizing credibility on the Internet, Burbules and Callister (2000) propose a "digital triage" for the critical reader of the Internet. They argue that Internet users are often bombarded by a voluminous amount of information on the Internet – from general surfing, email, discussion boards, and list-servs. Information from these varying data sources must be evaluated for persuasive strength, and one way to do that is by rhetorical analysis. Recognizing the immense challenge inherent in such a task, the authors develop a number of heuristics for evaluating the rhetorical quality of information on the Web. This includes cross-checking information, adopting a skeptical stance, developing an understanding of how search engines rank-order sites, and so on. These are good and useful suggestions which help broaden our understanding of the pragmatics of an Internet rhetoric.

Conclusion

The Internet has already proven itself useful in helping scholars flesh out theory in a variety of disciplines, broadening our understanding of concepts including identity, community, and democracy. While our enthusiasm for this medium must be tempered with a critical eye, we have seen that the Internet has also served as a place that enables a more complete understanding of the realization of rhetoric. We have seen that in rhetorically ill-structured spaces, the Aristotelian notion of *style* has elevated importance. In invoking this concept, some may worry that we may be forcing Aristotle to sleep in a

Procrustean bed. This is not the case, for Aristotle foresaw the possibilities of new media and built in the necessarily conceptual flexibility: "It should be observed that each kind of rhetoric has its own appropriate *style*. The *style* of written prose is not that of spoken oratory, nor are those of political and forensic speaking the same"(1414a). Past discussions of rhetoric too often impose an understanding of rhetoric that is more applicable to print media. We should acknowledge that the Web is its own collection of genres that uniquely combines the characteristics of broadcast media and interpersonal communication. As Wathen and Burkell (2002) comment, "It has been proposed that the Internet combines the broad reach advantages of mass communication channels with the persuasion characteristics of interpersonal channels by allowing for give and take between the message source and receiver," and as such, warrants its own rhetorical understanding – one based on holistic perceptions of *style*.

The Internet is an ill-structured domain, so it only follows that one of the strategies employed for assessing the materials on the Internet is also ill-structured. Admittedly, the idea of a perceptive credibility is very messy, difficult to teach, or even more difficult to assess or observe. It seems like an ineffective way to teach or model decision-making on the Internet, but in this way, it mirrors the problems and opportunities of the Internet itself. As Tim Berners-Lee famously observed, "The Web will always be a little bit broken." So also is our use of it.

CHAPTER 8
THE DEMOCRATIC VALUE OF THE INTERNET

The Goliath of totalitarianism will be brought down by the David of the microchip.
U.S. President Ronald Regan, 1989

We don't believe in kings, presidents, or voting. We believe in rough consensus and running code.
David Clark, Senior Research Scientist at the MIT and Internet Architect

In the last decade there has been increasing interest in how the Internet effects the beliefs and practices of development of citizens and consumers, and, more broadly, the revitalization of the public sphere, the invigoration of participatory democracy, and the closer realization of a just society. Howard Rheingold, an early theorizer on Internet community observed that "virtual communities could help citizens revitalize democracy, or they could be luring us into an attractively packaged substitute for democratic discourse" (Rheingold, 1993, p. 276). The promise - and the false promise - of the internet politics and democracy perhaps first drew public attention during the presidential campaigns of 2004.

The democratic primary elections for the 2004 presidential nomination were in many ways no different than they had been for years. Assembled before voters were an assorted number of politicians, all with established careers in politics on the national stage. It would appear to be a year like any other – speeches were delivered, promises were made, stumping was in full effect – yet, the 2004 campaign season was hardly politics as usual. The rapid rise of Howard Dean illustrated that the political landscape had undergone a change unnoticed by most informed observers. Dean, a little known governor from Vermont, was a fiery and charismatic speaker who challenged the core platform of the Democratic Party. While outspoken reformers hailing from outside the

beltway are no strangers to United States politics, what made Dean unique was his campaign war chest. Dean had raised more money than any other Democratic candidate; more than established and seasoned politicians like John Kerry and Richard Gephardt. Dean accomplished this surprising feat not by the support of several politically-active billionaires, but through the small donations of many. Sixty percent of Dean's campaign resources came from donations of $200 or less, compared to Bush's thirty-one percent and Kerry's thirty-seven percent ("Small donors and online giving", 2006). He and his campaign team leveraged the power of the Internet to catalyze a grassroots effort to garner support, raise money and ultimately, place Dean as the forerunning democratic candidate.

The Dean campaign's innovative Internet-based fundraising and campaigning model did not propel Dean to the presidency, as poor strategy, aggressive use of campaign funds, and perhaps even an in-person style less compelling than Dean's Internet persona, led to a disappointing showing for Dean at the Iowa caucus. His lackluster showing at this important caucus leeched his campaign of its momentum, and Dean eventually dropped out of the race, conceding defeat to John Kerry. Dean's Internet-fueled presidential rocket ride gave him a permanent place in national politics, as he went on to chair the DNC. Joe Trippi, Dean's political consultant credited with leveraging the Internet in such an effective manner, came out with a book forecasting the important role the Internet would play in the future of American politics. In *The Revolution Won't Be Televised*, Trippi's (2004) enthusiasm for the democratic potential of the Internet leaps off the page:

> For twenty years, people have been calling this era of computers, the Internet, and telecommunications the "information age." But that's not what it is. What we are

> really in now is the empowerment age. If information is power, then this new technology – which is the first to evenly distribute information – is really distributing power. This power is shifting from institutions that have always been run top down, hording all the information at the top, telling us how to run our lives, to a new paradigm of power that is democratically distributed and shared by all of us. I believe that what we do with that power will determine the course for this country. I believe the Internet is the last hope for democracy. I believe Americans will use it the next decade to bring about a total transformation of politics, business, education, and entertainment. (p. 5).

Trippi's unquestioning faith in the Internet is not without foundation. Dean's candidacy in the 2004 Democratic primary sent a clear message to Democratic machine that the Internet, when properly utilized, can propel a candidate to the head of the pool and arm him with a war chest of financial resources. Through its use of the Internet, the Dean campaign redefined grassroots effort, from local rally and town hall meeting, to a hyperreal mobilization fueled by blogs, web donations, and Internet psychology. Even though Dean was not successful in his bid, he did demonstrate that working outside the existing political structure is possible. But do these successes warrant Trippi's crowning of the Internet as "the last hope for democracy"?

This chapter seeks to evaluate the political and ethical dimension of the Internet by assessing its value as a common good and democratic space. Exploring the political dimension of technology is a well-established tradition, dating back to the early Greek philosophers. Aristotle argues that inside technology (techne/craft) are the values of its designers. As he says, "Every craft is concerned with coming to be; and the exercise of the craft is the study of how something that admits of being and not being comes to be, something whose origin is in the producer and not in the product" (Aristotle, p. 6.32.10). Browker and Leigh-Star (1999) reframe Aristotle by suggesting that "values, opinions and rhetoric are frozen into code" (p. 135). If the answer to Winner's (1985) question,

"Do artifacts have politics?" is yes, what are the politics of the Internet and how do they influence our democratic sensibilities?

This chapter is organized into four principle sections. First, I will begin by reviewing the meanings of "democracy" by briefly discussing its history, its critics, and its principle features and theoretical dimensions. Democracy's sketchy history does not allow for crisp definitions based on a long tradition of practice, and as such, the views of what constitutes a democracy or democratic activity vary widely. Second, I will explore the Internet's impact on democracy, using David Held's (1995) seven "sites of power" that are "necessary to enable people to participate on free and equal terms in the regulation of their own associations..." (p. 191), a framework that encompasses aspects of both procedural democracy and cultural democracy. Held's framework will reveal both the complexity of democracy and democratic practices on the Internet. Third, I will review the division of views of those in Internet studies who describe the democratic value of the Internet. I will offer a continuum as a tool to organize many of these perspectives so that we might be able to more readily draw conclusions. Such a review will illustrate the need for understandings of the Internet and democracy that stress the plurality of each. My fourth and final section will expand on this conclusion by leveraging John Dewey's notion of democracy as *becoming*.

Meanings of Democracy

Before I can evaluate the role of the Internet on democracy, the nature of democracy itself must be explored. Most of those who have led informed discussions about democracy, its roots, meanings, and boundaries have agreed that the concept "democracy" is contested and its complicated history resists clear definition. It may seem

strange to discuss the meaning of such a common word as "democracy," and for some such a discussion should be a short one. From its Greek etymology, we know that democracy, literally translated is "rule by the people" (*demos*, "people"; *kratos*, "rule"). It would follow that democratic forms of government are ruled by the people for the people, to paraphrase Lincoln. With our modern sensibilities, we have a vivid sense of what this could or should look like. Many times this involves imprinting liberalism upon democratic rule; that is, rule by the people has often come to include respect for individual rights. Inalienable freedoms, universal suffrage, and open dialogue are pillars upon which a "modern" democracy stands. Put another way, for many who use the term today, democracy "signifies" these things. As the chapter of semiotics explained, the relationship between the signifier and the signified is arbitrary and certainly subject to change.

For some, democracy may be described through its *procedural characteristics*: free-elections, balance of governmental powers, open political competition, universal suffrage, and public debate. Others discuss not a single democracy but distinguish between many *historical forms* of democracy: Athenian democracy, defensive democracy, protective democracy, demarchy, Jacksonian democracy, Jeffersonian democracy, liberal democracy, participatory democracy, polyarchy, social democracy, Soviet democracy, and even totalitarian democracy. For still others, democracy is not best understood as a form of national government or a series of processes alone, but instead, needs to be understood through *philosophical claims* about the nature and capacities of people and societies. These philosophical claims are rooted in human social dispositions, in the capacity for critical reasoning and collective deliberation, in a belief

in human rights and freedoms and an argument for the inherent legitimacy of a governance based on these. Democratic capacities include a sense of human connection, collective responsibility and a willingness to be civically active. Democratic understanding should always be understood to be in flux and this flux requires us to constantly wrestle with the meanings of freedom, rights, voice, fairness, representation, and justice on our way to their realization. From this point of view, democracy has an anti-foundationalist epistemology. In theory, open media, open public spheres, equal opportunity, and deliberative procedural processes are intended to alleviate the tensions between the universalistic claims of rights and human rights and the particularistic claims to autonomy coming from different groups.

Considering the Democratic Effects of the Internet: Held's Sites of Power

The term democracy can clearly hold a range of meanings, making a conversation of the democratic value of anything problematic. Yet, as a review of e-democracy scholarship will show, many have made bold claims about the Internet's democratic value, which range between the Internet as a utopic technology for the promotion of democracy to the Internet as a technology of false democratic promise. Before turning to the limited understandings of democracy and the Internet common to Internet studies, I first offer my own analysis of the Internet and democracy. In this section, I provide an evaluation of the Internet's impact on democracy, using David Held's (1995) seven "sites of power" that are "necessary to enable people to participate on free and equal terms in the regulation of their own associations..." (p. 191). These rights—*health*, *social*, *cultural*, *civic*, *economic*, *pacific* and *political* are the foundations of what Held calls the

democratic public law and they include both procedural characteristics of democracy as well as "sites" related to civil society and capacities of people and societies.

The Advantages of Held's Framework for Internet Studies

Held's "spheres of human interchange" define democracy in very broad terms, rather than narrowing it to a form of governmental process alone or to civic or cultural considerations alone. I believe this to be advantageous for two reasons. First, Held's framework throws into sharp relief the realization that voting rights don't mean much if one experiences economic or social inequality, or for that matter, coercion or violence, the darkest aspect of lived experience. It is best to cast a wide net when evaluating democracy as "people's equal interest in the principle of autonomy can only be protected if they enjoy a common structure of political action across each of the sites of power" (p. 191). Second, these bundles of rights expand the way that Internet studies typically evaluate the democratic possibilities and realities of the Internet. Rather than conceptualizing the Internet as purely an information network, the use of Held's sites of power properly frames the Internet as a socio-cultural entity. The Internet is more than connective tissue for information; it embodies social, cultural, economic, legal, and political practices. Held's work, when applied against the Internet, reveals this.

A General Limitation of the Internet

When one discusses the impact of the Internet on any social, political, legal, or economic sector, issues of access often dominate the conversation. No matter how the Internet influences anything or anyone, its impact is often mitigated by variability in Internet penetration rates. Though Internet penetration rates have dramatically increased

over the past decade around the world and here in the United States, there still exist great disparities in Internet use among various categories of people. Internet usage studies from December 2006 indicate that the poorest Americans lag behind in Internet usage, as do African-Americans and the uneducated. Over ninety percent of households with annual incomes over $50,000 use the Internet, while about half of those households making less than $30,000 per year do. Ninety percent of those with a college degree use the Internet, while only fifty-nine percent of those with high school educations do ("Demographics of Internet Users", 2006). The statistics are equally divided when we look at Internet adoption rates internationally. Europe and North America make up approximately half of the world's Internet users, even though they only comprise around 17% of the world's total population. Asia, the Middle East, Africa, and Latin America all have Internet penetration rates under 20%. Only 3.5% of Africans have access to the Internet ("Internet usage statistics: The big picture", 2007).

For the minority of humans who have access to the Internet (approximately one out of five people), there is also the question of which Internet they access. The Internet is not language-neutral. Much of the early Internet content was created in English, reflective of the demography of early Internet adopters; however, as the world begins connecting to the Web, the dominance of the English Net is fading. Fueled by its enormous population base, some believe that Mandarin may become the new lingua franca of the online world, though English will continue to be an important international language (J. Q. Anderson & Rainie, 2006). Regardless of which languages remain dominant, those Internet users in less developed or less populated parts of the world may not experience the totality of the Web simply due to the limited content in their native

language. Certainly the Internet of Arabic is different than that of English or French, and these groups differ from the Chinese Web. Thus, connectivity does not tell the whole story when considering the level of influence the Internet may have in democratic spaces, particularly if one is choosing to examine the phenomenon globally.

Inconsistencies in access cloud any evaluation of the Internet. To this point, many technology pundits, including Howard Rheingold and Ed Lyell, have identified increased access as the most important issue facing the development of the Internet between now and 2020. Lutfor Rahman, executive director of the Association for Advancement of Information Technology at Pundra, Bangladesh, opined in a report on the future of the Internet, "Everybody should know the benefit and problems of using the internet, and this should get first priority" (J. Q. Anderson & Rainie, 2006, p. 69). Rhaman's recognition of the benefits and problems of Internet use provides a leveled perspective on the impact of the Net in social, political, and economic spaces. As the forthcoming analysis will reveal, the Internet offers exciting developments for democracy, and yet, it still may be a very conservative technology in the effects it produces. What follows is a site-by-site analysis of the Internet's democratic value according to Held's (1995) framework, beginning with health.

Health

"Health rights concern the basic conditions of human agency," writes Held (1995, p. 194). Without basic rights protecting physical and emotional well-being, Held argues that human beings will not be able to function fully. This site is fundamental to a democratic experience, without which the democratic process will be incomplete, distorted, and without root. In addition to basic rights for well-being, Held includes

"non-toxic, sustainable environments." As such, he cautions that balance must be struck between individual rights and the impact of any action on the global commons.

It is difficult to imagine that the Internet's influence on basic rights to physical and emotional well-being is singularly positive or negative. It could be argued that the Internet connects individuals to others like them through its offerings of virtual communities, associations, and groups. For those with geographical limitations, the Internet can prove to be a vehicle to connect one's self to an extended network of similar-minded individuals. Sherry Turkle (1995) has pioneered research efforts to describe the sense of personal and psychological fulfillment realized by those that leverage the Internet through email, role-playing games, and chatrooms to develop a stronger connection with humanity. She argues that "many of the institutions that used to bring people together – a main street, a union hall, a town meeting – no longer work as before...[however], social beings that we are, we are trying...to retribalize" (p. 178).

For Turkle, the Internet plays a central role in the process of retribalization, and it is easy to see why she was enthusiastic. Certainly, the proliferation of network-based communication technologies – texting, instant messaging, email, web cams, cell phones, and social network sites – provide greater opportunity to combat the negative effects of television on connecting with others (Putnam, 2000). A study published by the Pew Internet & American Life Project found that even simple Internet technologies like email influence the formation and qualities of the social networks of Internet users. Social network orthodoxy dictates that as an individual's social network increases, the percentage of contacts made with individuals within the network declines. In other words, it is easier for Jane Doe to keep in contact with ten members of her fifteen

member network than it would be for Jane to communicate regularly with twenty members of a thirty member network. The additional members in the thirty member network place too great a strain on Jane's time, making the percentage of members contacted decline. This pattern holds true for all forms of contact, save one – email. Pew researchers found that "as the size of people's social network increases, the percentage of one's social network contacted weekly by email does not decline but remains about the same at about 20% of core and significant ties" (Boase, Horrigan, Wellman, & Rainie, 2006, p. iii). In other words, email can help us stay connected with larger support networks.

The unique attributes of email provide reason for its unique value to social networks. Email is easy to use, free, convenient, and asynchronous. Many of these same properties likely influence how the Internet is used in connecting to broader social networks. Users can pick the time, context, and conditions of their participation with others on the Net in ways far different than the physical world, and these differences appear in how people use the Internet. One study found that 84% of American Internet users have connected with an online group or community such as trade associations, hobby groups, fan sites, religious groups, political organizations, and support groups for medical conditions (Horrigan, 2001).

As health support groups, communities, and information websites are particularly important to Held's "health" site of power, it is worth noting that the Internet is a popular tool toward gathering health-related information and support. Susannah Fox (2002, 2006) found that eighty percent of American Internet users have searched the Web for information on at least one of seventeen health topics, ranging from disease to diet

information. On any given day, more than eight million Americans use the Internet for health information searches with the majority of users finding themselves satisfied with the information they find. Twenty-six percent of American adults have researched prescription drugs online (Fox, 2004). The sobering part of Fox's studies is that seventy-five percent of those surveyed did not critically evaluate the health information they found online by checking source or date of the information.

The usage studies discussed here do not consider the value of many of the latest Internet technologies for retribalization. Social networking sites including facebook, myspace, and friendster assist their members' efforts to maintain or expand their personal social networks. Members keep abreast of each other's activities by posting messages, pictures, and linking between accounts. Such sites how we form tribes. For some informed observers, "the internet has fostered transformation in community from densely knit villages and neighborhoods to more sparsely knit social networks" (Boase, Horrigan, Wellman, & Rainie, 2006, p. ii). These new social networks may be sparsely knit, but they are wide-reaching and robust. When Internet users desire more robust forms of communication than what typical social networking software provides, many turn to voice-over-IP technology. Voice-over-IP (Internet Protocol) allows users to talk to each other freely and clearly over the Internet. This technology converts the Internet into a global telephone. The most popular brand of such technologies is Skype, which sent shockwaves through the traditional world of telecommunications. When Former Federal Communications Commission Chairmen Michael Powell saw Skype, he immediately recognized the far reaching impact of the technology: "I knew it was over when I downloaded Skype. When the inventors of Kazaa are distributing for free a little

program that you can use to talk to anybody else, and the quality is fantastic, and it's free--it's over. The world will change now inevitably" (Roth, 2004). The world has changed as Skype and other Internet based technologies offer cheap or free, ubiquitous methods for communication. And people are using the cheap communication possibilities of the Internet to connect with a broader emotional and social network.

Limitations of the Internet for Health Rights

The problem with the Internet and its relationship to Held's formulation of health/body rights is that while the Internet is a virtual space, one that can "take" the user anywhere in the world, bending our sense of time and space, it does not physically move us. The Internet may very well provide new opportunities for identity and greater sense of community and connectedness, but it does far less to provide protection of physical freedoms. This is because no matter where the Internet enthusiastic is virtually in the world, she still has a physical address and is subject to the laws of the land. This is the argument advanced by Goldsmith and Wu (2006), two law professors who argue that because Internet users are located in real places with real governments, rules, and regulations, the Internet is far from borderless. Rather, Goldsmith and Wu argue that the Internet is subject to extensive government oversight and regulation. So, if one does not have basic physical rights in the nonvirtual world, it is difficult to imagine how the virtual world may rectify the problem. This is typified by recent reports of steep measures taken by the Chinese government for those teenagers who are "addicted" to the Internet. Alarmed by the "grave social problem" of Internet addiction, the Chinese government now offers parents the option of checking their children into a military-run institution designed to treat Internet addiction. Treatment includes electric shock therapy and

isolation from family and friends (Cha, 2007). For several years, policy groups have reported that China employs approximately 30,000 "Internet police" who monitor the use of the Internet by its citizens (Grebb, 2002). The consequences for "inappropriate" Internet use in China can include imprisonment.

Even in those societies that present themselves as free, such as in the United States, the use of the Internet remains closely connected to the politics of bodies. Lisa Nakamura (2006) describes how kozmo.com, a commercial service for delivering convenience foods and products, claimed to deliver to those areas with the highest rates of Internet penetration and usage. However, it was later revealed that kozmo.com refused to deliver to some upper-class African American neighborhoods, even though their Internet penetration was as high as predominantly Caucasian neighborhoods which did receive the service. Nakamura concludes, "It seems that these African-American Internet users possessed online identities too firmly moored to their raced bodies to participate in the Utopian ideal of the Internet as a democratizing disembodied space" (p. 322). This is but one example of "cybertyping."

The Internet offers a dubious relationship with the emotional health and wellbeing of children who go online. As usage statistics and observation confirm, children and adolescents turn often to Internet-based technologies for social facilitation. Instant messaging, facebook, and myspace are some of the common social network tools used by the young. While it could be argued that young users of the Internet enjoy more robust social relationships with friends, the Internet is also a place of emotional and physical danger. It has been reported that in 2003, one in five kids aged 10 to 17 received an Internet sexual solicitation (McNamara, 2004). As recent media attention has shown, the

Internet can be a haven for sexual predators and pedophiles. Yet, the Internet is also instrumental in bringing attention to registered sex offenders. Many states now offer Internet-based registries that identify the location of sexual offenders. So the Internet may be a site of emotional and social freedom for pre-adults, but such freedom lures those who would do harm to children as well.

A final example of bodily regulation on the Internet is that of "cyberbullying." Cyberbullying is a term used to describe how some students use the virtual planes of the Internet and other communication devices to extend their reach of physical, emotional, and psychological intimidation. In some ways, cyberbullying is similar to its traditional counterpart: it can involve childish harassment, denigration, name-calling, and exclusion. However, one of the differences of bullying in the electronic age is that those that bully online are emboldened by a sense of distance and anonymity. Often, cyberbullies elevate their methods of intimidation, sometimes escalating as high as death threats, stalking, and threats of extreme physical violence (Li, 2006).

The reality of the Internet as a platform for preserving or extending health rights is far from clear. Certainly, many of the Internet-based collaborative technologies (such as the Web 2.0 technologies) provide new means by which humans can overcome geographical limitations to connect to an increasingly broad network of people. In this way, the Internet may be a tool which enhances emotional well-being. The Internet is also a regular source of information for those seeking health information, though these consumers of information are often uncritical about the information they find on the Web (Fox, 2006). However, as many examples have shown, the Internet does little to secure physical well-being. Goldsmith and Wu's (2006) thesis illustrates that our bodies and

minds are very much situated in a physical context, even if we identify more closely with a virtual world. As such, the politics of our bodies including race (cybertyping), age (cyberbullying), and citizenship (government regulation of Internet practices) are very real when we use the Internet. As Barry Wellman, director of NetLab, once observed, "We still have bodies; we, states and organizations still have territorially-based interests (in the political sense of that word)" (J. Q. Anderson & Rainie, 2006, p. 54). This makes the Internet a dubious site of health/body power.

Social

For Held (1995), social rights are those that "affect the nature and range of opportunities and skills citizens can enjoy and develop as members of a political community" (p. 195). Included in this site of power is a cluster of rights that include universal access to education, childcare, and social services. While the Internet may fall silent on issues of childcare and social service, it does present certain opportunities for universal education. The Internet has long been lauded as a democratically constructed knowledge network, one lacking formal gatekeepers. Information wants to be free, and freedom may be found on the Internet, a space with far fewer publication standards than other media outlets. Though we may question the notion of "free information" (see Chapters 4 and 7), the initial results of the Internet's success as an information platform are startling – as of 2002, the Internet boasts of well over a half of a million *terabytes* of information ("How much information? 2003", 2003). As a vehicle for propagation of information, the Internet is decidedly effective; however, we should not confuse access to information with access to education. Information does not always create knowledge; knowledge does not always form education. Also, "free" information is not "universal"

information. Information on the Internet, though easily published, has been filtered, sorted, and classified. Even the often optimistic technology commentators like Steven Johnson (1997) agree that "there is no such thing as digital information *without* filters" (p. 38). So information on the Internet is not necessarily free, universal, or educative. Does this mean that the Internet is disqualified as a vehicle for universal education?

Recent developments on the Internet suggest otherwise, though it is still too early to fully judge their success. What has captured the attention of those who wish to promote universal education on the Internet are the recent initiatives in creating "open courseware." Open courseware is a movement led my MIT to provide their course content online for free. According to MIT's open courseware website, the university's project goal is to "provide free, searchable access to MIT's course materials for educators, students, and self-learners around the world" ("About OCW", 2002). MIT's initiative represents an aggressive step toward the universal education, and anecdotal evidence reveals some impact of their efforts. Self-directed students from Vietnam to Nashville have found useful extensions for their education at the MIT OCW site (Diamon, 2003). A number of universities have now followed suit and begun to move their materials to free online repositories. Also, other projects that step outside the efforts of a single institution are beginning to gain traction. The best known in this group includes Wikipedia, the well-known "free encyclopedia that anyone can edit." Wikipedia's growth has been rapid. The site now draws over 160 million unique visitors each month and holds over 1.6 million articles in the English wikipedia (McNichol, 2007). This site certainly is valuable to anyone who needs a general survey of a topic. An emerging location for free coursework is Connexions (www.cnx.org), an environment which opens

up MIT's open courseware model to the general public. The site is designed to be an environment for open collaboration of academic information, a "content commons" in which teachers, professors, and students can create modules of learning and assemble them into larger courses.

Perhaps the most influential attribute of the Internet for self-directed learning is the availability with which it offers Internet surfers access to primary sources and "classic" works. The aptly named Project Gutenberg (gutenberg.org) provides access to around 20,000 free ebooks in a number of languages. Project Gutenberg relies on volunteer "distributed" proofreaders to work collectively to compile its ebooks. In a typical month, Internet users download over 2 million free ebooks from the site, from *The Adventures of Tom Sawyer* to *War and Peace*. Founded in 1992, Project Gutenberg is one of the older efforts to democratize print information. More recently, Scribd.com, the "YouTube" for documents, allows its users to freely post and comment on any documents they wish to share. Scribd.com allows for those texts not classified as "classics" to be shared electronically between users.

Limitations of the Internet for Universal Education

The Internet's potential as a location for universal education is dampened by two realities of the Internet. The first is the problem of universal access to the Internet. Ninety percent of those with a college degree use the Internet, while only fifty-nine percent of those with high school educations do. The Internet may be positioned to facilitate universal access to rich educational options, but its impact is mitigated if those that can benefit most from open courseware (the poor and uncredentialed) have the lowest rates of Internet usage ("Demographics of Internet Users", 2006). A second

problem is how these self-directed learners who do find ways to utilize the educational material found on the Internet transfer their informal education into economic and civic capital. Lacking the authority associated with learning credentials from official institutions, one wonders what explicit benefit can be reaped from learning from unsponsored online courses. In its current form, the new Internet initiatives geared toward universal education are best understood as an unfulfilled promise. As the Internet matures, we will likely see open courseware's footprint expand to include more courses for a greater number of fields. It also may hold that Internet penetration rates will continue to increase, particularly if the cost of access continues to decline. What people are able to do with this Web-based learning material is still a great unknown.

A third criticism of the Internet as an educational equalizer concerns the problems with reliability and accuracy of information found on the Net. While this topic is explored in greater detail in Chapter 7, the lack of gatekeeping on the Internet does allow anyone to publish anything. This is the Internet's greatest strength and perhaps its biggest weakness. Sites like Wikipedia are marvelous examples of an informational collective commons; yet, such sites are also prone to the accident but sometimes deliberate falsification of information. There have even been problems with those who are given the responsible to monitor problems on the Wikipedia site, such as the case where a 24-year old college named Ryan Jordan dropout lied about his academic credentials (he claimed to be a tenured professor with a Ph.D. in theology and cannon law) and edited over 16,000 Wikipedia articles (Wolfson, 2006). As a wikipedia manager, Jordan's work was highly respected by many in the Wikipedia community.

The revelation of his false persona is an indication of some of the information problems facing open-source information networks.

Cultural and Civic

Often coupled together are cultural rights and civic rights, both of which are commonly associated with democratic societies. We also take them together because the Internet's relationship to these two sites of power is similar. At its core, the cluster of cultural rights contains "a distinctive set of conditions and principles without which citizens would be unable to pursue and test freely the nature of symbolic orders and different modes of discourse" (Held, 1995, p. 196). Included in cultural rights are those principles that concern weighty matters including freedom of thought, faith, expression, and criticism. Held argues that inextricably linked to these conditions is an atmosphere of tolerance in which forms of expression do not present "categories of persons as inadequate or incapable of autonomy" (p. 196). Civic rights are a set of rights that include free association with autonomous organizations, active membership of civic groups, and freedom of information. Held encourages his readers to consider "the quality of access to these associations and the nature of their accountability to their members" as key metrics for evaluating the legitimacy of civic rights (p. 196).

When considering the impact of the Internet on cultural and civic rights of power, it is important to consider the Internet's relevance to the key pillars of these sites of power: freedom of thought and expression, criticism and toleration, association and organization, and information. In this process, there is a tendency to evaluate how the Internet is used rather than the technology itself. For example, it is easy to find shocking examples of ways in which fringe groups have leveraged the power of the Internet to

bring attention to their misguided beliefs. At the time of this writing, if you google for "jew" one of the top-ranked sites is jewwatch.com, which presents itself as a "the Internet's largest scholarly collection of articles on Jewish history." In reality, the site is a massive collection of anti-Semitic materials. Visitors can read of Jewish conspirators, Jewish-sponsored assassinations, Jewish-controlled governments, and extensive propaganda about World War II and the Holocaust. The site makes devastatingly effective use of a wide range of Internet technologies, from basic html pages to mp3 downloads and youtube videos. It is hyperlinked hatred.

Jewwatch.com is so disturbing that Google runs a banner ad at the top of the search results explaining how the site's high ranking is not reflective of the opinions or attitudes of Google, Inc. A search for "Nazi" and other intolerant groups reveal more websites preaching values that would reduce the autonomy and dignity of particular categories of people.

Are these examples of online hatred representative of the Internet? Does the activity of solitary bigots spoil the Internet as a space for the promotion of cultural rights? Does this form of free association invalidate the Internet's utility for civic rights? We do not think so. Though sites like jewwatch.com violate held's requirement for tolerance in speech and action, the same can be said for societies that allow for free speech. The Internet may mirror the ugliness found in the virtual world, but isolated acts of intolerance on the Net should not diminish our regard for the technology. The Internet is, if anything, a well-suited environment for freedom of thought and faith, expression and criticism. Within the thousand plateaus of the Internet is ample opportunity for valid, healthy self-expression. Consider the utility of the blogosphere for expressing one's

thoughts, working out beliefs, and criticizing established powers. Blogs are an enormous part of the Internet; as of 2007 the blog search engine Technorati tracks over seventy million blogs ("About Technorati", 2007). The blogosphere grew 100 fold from 2003 to 2006, and it now averages 1.6 millions posts per day (that is over 18 posts per second) (Sifry, 2006). The ease of publication makes blogs the virtual instantiation of independent thought; the ease of idea propagation makes them highly effective sharing beliefs and ideas.

These same characteristics could be said of the Web itself. Its decentralized architecture is built with the individual in mind; its culture is for the "creative commons." If evaluated solely by its potential, the Internet is an optimal blend of narrowcasting and broadcasting, giving voice with minimal cost or obstacle. Though some of the most popular sites on the Internet are corporate media outlets (e.g. msnbc.com), the Internet as a platform for information and ideas falls outside of mainstream media. This positions the Internet as a vehicle for freedom of information and association. Groups like moveon.org are examples of highly effective use of the Internet's strengths – providing a platform for alternative information and transcending the limitations of geography to build a national association of political activists. The same can be said for Howard Dean's effective use of the Internet to form a grassroots campaign finance vehicle which leveraged the small contributions of many. YouTube has now added its "You Choose 08" site, an online repository for presidential campaign related video. While the site offers a number of campaign-produced videos and commercials, it also will feature "response videos" to candidates and issues made by youtube members (Steve, 2007).

Internet-fueled associations and the propagation of free information have done more than propel unlikely political candidates or provide fodder for a sea of bloggers. In a celebrated account, Howard Rheingold (2003) describes how Filipinos used text messaging to stage massive demonstrations and force the resignation of Philippine President Estrada, whose rule was tainted by corruption charges and impeachment proceedings. Protesters coordinated demonstration locations and attire ("Wear blck"), drawing out over a million protestors over a four-day period. Rheingold raises this as an example of a grassroots use of "cooperative" technology to hold governments accountable.

To summarize, the most promise aspects of the Internet as a site for civic and cultural rights are not just the ability of small interest groups to find and communicate with each other but, more importantly, the leveraging of power by smaller, less powerful and geographically dispersed groups with common interests. The internet facilitates the availability of a wide range of points of view, and there is a great variety and range of archival materials on the Internet, from journalistic, academic and private sources, that often have a short life in print publication or required research skills and special trips to libraries to access.

Limitations of the Internet on Cultural/Civic Rights

As the example of Jewwatch.com illustrates, the capacity of small interest groups to find and communicate with each other and also leverage power, is only as healthy as the groups themselves. The internet facilitates the power of grassroots democracy and fascism alike. A concern with internet based groups is that if they are vile, they don't experience the sort of social pressure that real time, real space groups do, when for

example the KKK marches in any community. In theory, democratic expression is to be mediated by counter opinion and by defined pubic limits on hate speech. Yet, this happens to some extent in internet environments. Many sites are filtered and censored. For example, selling Nazi paraphernalia and propaganda is expressly forbidden under German law. The large trading site *BigPost* "strictly forbids any item that is excessively offensive or that promotes or glorifies racial, ethnic, sexual or religious hatred or bigotry in any form. Freedom of expression is important to BigPost; but not at the expense of other users" ("Bigpost listing rules", 2007).

The problem, of course, is that what is censored varies enormously by website and even by nation. However promising the growth of the blogosphere or examples from political association sites, the Internet is not a utopian compilation of code that is beyond the reach of repressive powers. As noted in the discussion of the site of health, the Internet is only liberal to a point and provides surfers little ability to escape the confines of national borders. Many governments exercise pervasive censorship of the Internet by tightly regulating, filtering, and monitoring how citizens use the Internet. Vietnam, Iran, Syria, North Korea, Cuba, and Uzbekistan all heavily filter Internet use and behavior, sometimes jailing dissidents who publish anti-government views on the Internet. The efforts of these countries are often modeled after the success of China to filter Internet activity. With the most advanced filtering technology in the world, the Chinese government has been successful at building the "great firewall of China." Researchers at the OpenNet Initiative tested the extent of Chinese Internet filtering made the following conclusion:

> Our testing found efforts to prevent access to a wide range of sensitive materials, from pornography to religious material to political dissent. Chinese citizens

> seeking access to Web sites containing content related to Taiwanese and Tibetan independence, Falun Gong, the Dalai Lama, the Tiananmen Square incident, opposition political parties, or a variety of anti-Communist movements will frequently find themselves blocked... China operates the most extensive, technologically sophisticated, and broad-reaching system of Internet filtering in the world. The implications of this distorted on-line information environment for China's users are profound, and disturbing (ONI, 2005).

Censorship of the Internet in China is multifaceted. Filtering may occur by those in control of China's Internet backbone, Chinese ISPs, Chinese search engines, and Chinese content production sites. Chinese blog services either prevent posts with certain keywords or remove them. Cybercafes in China are required to keep a log of their patrons Internet activities. Internet police monitor activity on the Internet. The presence of Internet filtering at many levels of Internet architecture (from blog censorship to search censorship) is likely to due to China's political and economic structure. Those who wish to run Internet-based services must get licensed by China's Ministry of Information Industry, and as such, comply with the culture of censorship required by the Chinese government (ONI, 2005).

There also exists considerable cooperation with the Chinese government by U.S. based technology companies with economic interests in the largely untapped Chinese market. In a well-publicized report, Google has agreed to provide censored search and news results to its Chinese users. Microsoft has admitted to removing the blog of a dissident Chinese blogger, citing Microsoft's policy to "adhere to local customs." The French media watch group "Reporters without borders" has also accused Yahoo of providing information to the China which led to the identification and imprisonment of Shi Tao for emailing "state secrets" to a foreign website. The "state secrets" that Tao

leaked was a message to his newspaper warning of the dangers involved in returning to China to mark the fifteenth anniversary of the Tiananmen Square massacre (Mills, 2006).

Generally speaking, the Internet does far less for free expression in nation-states that do not offer protection of speech. In many ways, the Internet is a better *amplifier* of open and free discourse than it is a *reformer* for these causes. This is not to imply that the individual is powerless to the hegemony of governmental oversight. Rather, it is only to say that the Internet is a place of free expression, thought, belief, and association – with two caveats. The first is that sometimes free expression on the Internet mirrors the ugliness of human history. For Held (1995), this would seem to dampen the openness of the Internet as a site of cultural and civic power. Such a collection of rights "should not be mistaken for an unlimited license to express oneself; for such a license fails to recognize barriers which ought to be created in order to protect the equal autonomy of others" (p. 196). Yet, the Internet – via blogs, social networking sites, and other collaborative technologies – is home to historically unprecedented self-expression, independent thought, association, and criticism. We only need to look at other mediums of expression – television, corporate book publications, radio monopolies – to recognize that for the individual, using the Internet to publish or find information freely and to build coalitions across local boundaries is the only plausible option for most citizens. Given the wealth of opportunity the Internet presents in the domain of cultural and civic rights, fringe intolerance should not deter our enthusiasm for the Internet. To balance this optimism is the recognition of a second caveat (and a familiar one by now). The Internet has been limited in its cultural and civic usefulness by the policies of national governments. Autocratic regimes have been highly successfully at controlling Internet

activity and behavior through filtering, firewalls, and policing. The disturbing examples of government censorship of the Internet and its users abound, particularly in nation-states that generally deny freedom of expression and association to its citizens; yet, we have also seen in the Philippines text messaging example that Internet-based technologies have also proven valuable in holding governments and politicians accountable for their words, actions, and policies. Thus, an enthusiasm balanced with caution from past abuses should define our attitude toward the Internet's impact on cultural and civic sites of power.

Economy

Each site of power is intended to protect the autonomy of the populous. The site of economy is no different, but of all Held's sites of power, economic rights are the most difficult to concisely define. Economic rights are concerned with the ability of members of a democratic society to pursue economic activity without "immediate financial vulnerability." Held provides several examples of economic rights, including guaranteed minimum income, diverse forms of consumption and productive property, and accessible productive and financial resources. Put another way, these rights are about ensuring opportunities for members of a democratic society, while providing assurance of basic needs.

It is difficult to imagine how the assurance of basic needs is met in lived experience of the Internet or in the potential that lies inside its design; however, there is some modest evidence that the Internet provides new access to productive and financial resources. In their book *Wikinomics*, Don Tapscott and Andy Williams (2006) argue that the Internet is a location for mass collaboration, transforming how groups form and work

together. "In the past, collaboration was mostly small scale. It was something that took place among relatives, friends, and associates in households, communities, and workplaces," write the authors (p. 10). Tapscott and Williams believe that the Internet drastically changes the ability of people to cooperate, which has understandably broad political effects. Many have suggested this same proposition, but what makes Tapscott and Williams' work unique is that these two business writers provide an extensive study of the economic effects of mass collaboration. Their conclusion is one that celebrates the empowerment of economic "Davids" in their battle against the industrial giants of flesh and steel:

> Now, to great chagrin, industrial-era titans are learning that the real revolution is just getting started. Except this time the competition is no longer their arch industry rivals; it's the uberconnected, amorphous mass of self-organized individuals that is gripping their economic needs firmly in one hand, and their economic destinies in the other. 'We the People' is no longer just a political expression—a hopeful ode to the power of 'the masses'; it's also an apt description of how ordinary people, as employees, consumers, community members, and taxpayers now have the power to innovate and to create value on the global stage (p. 14-15).

Is this more rhetoric than reality? It may be, but Tapscott and Williams (2006) do provide examples of "wikinomics" in action. Their lead example is the story of Goldcorp Inc., a struggling Canadian good-mining firm. The underperforming company invested ten million dollars into exploratory drilling of one of their mines to determine if there was more gold to be extracted. The results were encouraging: test drilling indicated that the mine contained rich deposits of gold, as much as thirty times what Goldcorp was currently mining. The problem settled in when Goldcorp's team of in-house geologists failed in providing an exact location of the gold. Inspired by open-source creation of software, the company's frustrated CEO, Rob McEwen, did the unthinkable: he

published all of the company's geological data dating back to 1948 on the Internet and issued the "Goldcorp Challenge" – $575,000 in prize money to participants with the best estimates of the size and location of the mine's gold deposits. This was a drastic move for a mining company, which typically guard their proprietary data religiously. The results of McEwen's bold move were even more drastic. The company received entries from far more than just geologists. "We had applied math, advanced physics, intelligent systems, computer graphics and organic solutions to inorganic problems," recalled McEwan, "When I saw the computer graphics I almost fell out of my chair" (p. 9). What shocked McEwan were the results of his experiment. The economic collaboration between Goldcorp and its contributors yielded over eight million ounces of gold discovered. Put in terms of dollars and cents, Goldcorp was transformed from a struggling $100 million dollar company to a $9 billion powerhouse.

While we should not call a $100 million dollar company a "David," this story does illustrate the power of economic collaboration on the Internet. And those research scientists, physicists, geologists, and mathematicians who did participate in the Goldcorp Challenge were "Davids" who benefited from the exchange. There are other examples of this same type of economic "exchange" between individuals and established companies. The pharmaceutical Novartis posted its research data in order to accelerate its quest to find a genetic basis of type 2 diabetes (Pincock, 2007). Still, this rather narrowly defines new access to productive and financial resources. More important to the idea of common access is the impact of the Internet on small business and the individual.

In a survey of businesses with Internet access, AC Nielsen found that 58% of small businesses surveyed indicated that the Internet helped their business grow or

expand, 51% said that the Internet made them more profitable, and 49% said the Internet helped them reduce costs (Greenspan, 2004). Perhaps most notably is the 15% of the small businesses surveyed who said they rely on the Internet for their economic survival. One can see why the Internet is popular among those who own and operate small businesses. The Internet offers small businesses a visible presence that can rival a well-capitalized large corporate website. Through Web-based technologies such as Google AdWords, highly-targeted, pay-per-click advertising maximizes the advertising dollars of small business (who typically cannot afford blanket advertising) (Battelle, 2005).

While the Internet has had a measurable impact on small and large businesses, it also has served the interests of the individual. Each day in the United States, over four million workers use the Internet to search for information about jobs (Boyce & Rainie, 2002). Put another way, forty-seven percent of all adult Internet users in the United States have searched the Internet for jobs. The Internet is also being leveraged by workers to improve working conditions, wages, and strengthen solidarity. A highly publicized example of the importance of the Internet to the labor movement is the 1996 Bridgestone/Firestone (BFS) strike. The BFS strike of 1996 is not nearly as famous as the Pullman Strike, the Haymarket Affair, or the historic sit-down strike at Fisher Body in Flint (which transformed the relationship between workers and management in the automobile industry). What does set the BFS strike apart from others in the labor movement were the tactics involved: the 1996 BFS was the first "cyber-strike." When Bridegstone/Firestone terminated several hundred United States workers during a dispute over pay cuts and other concessions, the International Federation of Chemical, Energy, Mining, and General Workers Union (ICEM) offered assistance to their U.S. affiliate.

Using their website as a organizational focal point, the union published the email addresses of major BFS executives and shareholders. With 20 million ICEM members, it did not take long for the union to apply enormous pressure on BFS via its "cyber-strike." The union's efforts drew sizable media attention, which forced a settlement of the contract dispute and the reinstatement of the terminated union members (Schmidle, 2002).

The Internet may provide a closer realization to Marx and Engels vision of uniting the world's workers than what has been possible in the past. The global reach of this network has flattened worlds (to borrow from Friedman (2005)), connected economies, and forever changed the global economic landscape. Perhaps it also may revitalize unions into worldwide organizations that act collectively on behalf of the labor interests of the invidual member nations. The irony of this possibility, or perhaps the enormous oversight in such an assumption, is that the Internet has faciliated the movement of jobs from high-paying industrialized nations to developing nations with lower-standards of living. In this way, the Internet may pull unions together and apart, as the interests of the workers in North America and Europe may be different than those of Asian or Central American.

Pacific

Pacific rights are those that concern the maintenance of a peaceful and non-violent existence. Pacific rights, like rights of health, are fundamental to a democratic experience, "for without [them] the deliberative, representative and aggregative elements of democracy cannot function satisfactorily" (Held, 1995, p. 198). For examples of pacific rights, Held offers peaceful coexistence, a lawful and accountable foreign policy,

and accountability of political leaders. Like previous sites of power, in countries that offer citizens stable freedoms, the Internet is a tool which can amplify the amount of accountability for public officials, transparency of government action, and fuel protest concerning the violation of basic human rights. In repressive nation-states, the Internet is often filtered and monitored, and thus restricts the ability of citizens to effectively publicize the violation of pacific rights. However, many times such nation-states are the subject of significant international pressure harnessed by human rights group who use the Internet to magnify violations of basic rights. What follows are a few examples of how early efforts on the Internet have increased the probability for a peaceful existence through public accountability.

There is a power found in video, beyond the reach of text or speech, to impact human perception and belief. The combinatory effects of cheap video recorders, cell phone video, and the video-sharing website YouTube are of enormous pacific value. For example, U.S. Senator George Allen's bid for re-election was derailed when video posted on the website youtube.com showed Allen calling a volunteer for his opponent's campaign the name "Macaca." The volunteer was a college-student of Indian decent named Shekar Ramanuja Sidarth. Allen's comments were taken as being racially insensitive and the incident brought to light Allen's less than progressive record on civil rights. Similar accounts exist for other political figures. The Internet was instrumental in circulating graphic pictures of human rights violations by United States military officers at Abu Ghraib prison in Iraq. The resulting military scandal and political fallout soured American attitudes toward the Iraq war and damaged the international reputation of the

United States. It also brought to public attention the questionable interrogation practices in Iraq, Afghanistan, Guantanamo, and secret CIA prisons.

Watchguard groups, such as Human Rights Watch, use the Internet to publicize human rights violations around the world. HRW fights for universal pacific rights by reporting on a wide range of problem areas: women's rights supression in Iran, atrocities in Darfur, attack of freedom of speech in Russia, and the myths and realities of cluster bombs used in war. Such groups bring attention and pressure on those governments who deny basic pacific rights, and though change is often slow, the HRW site offers interviews of leaders from sanctioned countries defending their human rights records. That public leaders feel compelled to defend their image from allegations is a sign of measurable progress in human rights. Most, if not all, international crises in which organized violence is perpetrated upon individuals have large-scale, highly visible web presences which draw attention, gather resources, and focus action toward helping. UNICEF, World Vision, the United Way, among others, all draw significant support through their Web sites.

Legal and Political

The legal and political site of power is the nuts and bolts of democracies. Included in this cluster of rights are the mechanics of democracy: due process, equal treatment before the law, debate, petitions, participation in public agenda setting, etc. (Held, 1995). Given that we are to evaluate how well the Internet may turn democracy's gears, we should narrow our discussion to those nations that are run by representative governments. In nations like the United States (which has been studied more than other democratic societies), the Internet is a likely tool for the enactment of democracy.

The 2006 mid-term elections in the United States gave further witness to the expansion of the Internet as a source of political information and personal debate. Thirty-one percent of all Americans (or 46% of Internet users) reported that they went online to gather information about candidates and exchanged views about those candidates with others via email (Rainie & Horrigan, 2007, p. ii). This group represents more than 60 million people, an impressive figure particularly considering the voter apathy common to mid-term elections. Motives for going online to get political information included the convenience of the Internet (71% cited this as a major reason) and the depth and breadth of the information available (49% cited as a major reason). Of those that did use the Internet for seeking and sharing political information, almost one quarter of this population became politically active by blogging or forwarding political commentary. Coupling these data with the figures cited earlier about the impact of email on social networks, one may conclude that through the Internet and email, American voters are discussing politics with a broader network of social contacts. It may be that we share political news and information with those we may not see or speak to via phone because of the convenience of the Internet and email and the depth of the information we find online.

These surveys point to increased political dialogue in online spaces through personal email and personal publication (e.g. blogging). The Internet is also becoming more valuable as a conduit for participation between public officials and their constituents. Based on their extensive survey data, Elena Larsen and Lee Rainie (2002b) project that 42 million Americans have used government websites to research public policy issues, 23 million have used the Internet to correspond with public officials

regarding public policy, and 13 million have participated in online lobbying efforts. Elsewhere the two researchers found that vast majority of local officials use the Internet to complete the duties of their offices (Larsen & Rainie, 2002a). This includes answering questions about civic issues via email, corresponding with constituents, and conducting research. The extensive use of the Internet by citizens and public officials is creating more amicable relationships between the two. Eighty percent of those surveyed reported that they were satisfied with government websites, while over seventy percent of online officials say that email with constituents helps them better understand public opinion.

Survey statistics aside, there are numerous examples of Internet-based lobbying campaigns. Examples include the boycotts (violent movies, corporations), environment advocacy (save whales, stop pollution), and candidate support for various offices. One of the better known websites that turns the gears of progressive politics is Moveon.org. Moveon.org successfully lobbied the Democratic Party of Nevada to drop Fox Broadcasting Company as the host of its presidential debate. The organizers of the site are also leading efforts to stop paperless voting and to protect funding for NPR and CBS. It also held a virtual march against the escalation of the war in Iraq. Conservative groups have similar mechanisms, such as thevanguard.org, which coalesce conservative sentiment into measurable action on issues ranging from victory in Iraq to partial birth abortion bans.

What the Pew Internet and American Life Project's survey statistics and the examples drawn from online advocacy groups reveal is that the Internet is important (and becoming more so) in the activity of democracy. The Internet is home to political exchange between individuals via email and blogging, diverse news and political

information, conversations between public officials and their constituents, and online petition, phone and letter campaigns. Based on the trend of data currently available, one would only expect the Internet to become increasingly more important to the procedures of democracy.

Reigning Opinions on the Democratic Value of the Internet

I offer up this analysis of the Internet through Held's (1995) sites of power to serve as a contrast with how many in Internet studies discuss democracy and the Internet. This is not to suggest that any conceptualization of democracy or the Internet is superior to another, for no one should lay claim to exclusivity on the meaning of either of these complex phenomena. Rather, a sites-of-power analysis of the Internet reveals how narrow some conceptualizations of democracy and the Internet are.

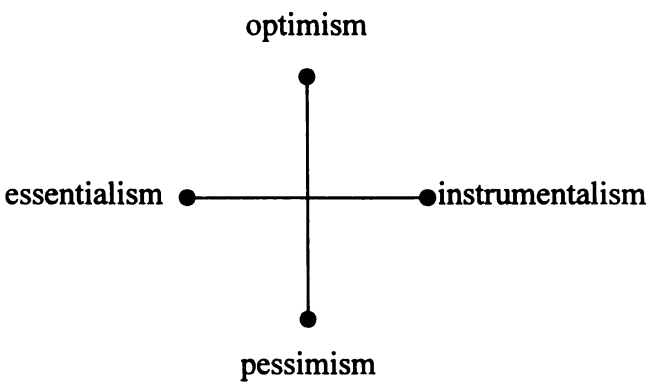


Figure 3. Continuum of democracy/technology perspectives.

One thing is certain: the question of the Internet's democratic utility is one that has been considered by a number of scholars and informed observers. The diverse collection of views can be organized in a variety of ways, but I have chosen to arrange these perspectives along two axes: one ranging from optimism to pessimism and the

other offering essentialism and instrumentalism as its opposite endpoints since this seems to capture the sort of presentations typical to the field. The geometry of this arrangement is illustrated in Figure 3. This schematic can be used to loosely organize the division of views about the Internet's democratic potential. I begin by exploring the utopian-dystopian axis, a binary familiar to technology studies.

Optimism, Democracy, and the Internet

Those optimistic about the democratic potential of the Internet, like Trippi (2004), often valorize the Internet, casting it as the socio-technical phenomenon that will revolution and reinvigorate democratic governments around the world. Typically, these commentators argue that the Internet's open architecture creates a platform that quite naturally supports expanded community, democratic exchange, and free discourse. For many of these writers, an increase in information availability will translate into increased democratic activity. This is best characterized in the scholarship of Charles Horton Cooley. Cooley, writing at the beginning of the twentieth century was not only optimistic about the prospects offered by new communication technologies like the railroads, telegraphs, daily papers, and telephones, but he saw their services as essential democratic participation. I quote Cooley (1909) at length:

> Democracy has arisen [in the United States], as it seems to be arising everywhere in the civilized world, not, chiefly, because of changes in the formal constitution, but as the outcome of conditions which make it natural for the people to share and to express a consciousness regarding questions of the day. It is said by those who know China that while that country was at war with Japan the majority of the Chinese were unaware that a war was in progress. Such ignorance makes the sway of public opinion impossible; and conversely, it seems likely that no state, having a vigorous people, can long escape that sway except by repressing the interchange of thought. When the people have information and discussion they will have a will, and this must sooner or later get hold of the institutions of society (p. 85).

For Cooley and many since him, access to information is a required component to political democracies. This perspective is quite popular for those that speak on the political impact of the Internet. For example, Dyson, Gilder, Keyworth and Toffler (1994) see the Internet as the "Magna Carta" for the information age, a platform that equalizes the gap between information rich and information poor, empowering those closest to political decisions. Selnow (2000) argues that the possibilities that are found in an information network as extensive as the Internet qualify it as "the soul of democracy." He sees the Internet as "a remarkable Swiss army knife of information and communication," one that harnesses the power of forms of media in one unified platform. "Like print, the Internet provides public information. Like the telephone, it permits interpersonal exchange. Like books and manuals, it offers tutorials, like movies and TV, it provides entertainment," writes Selnow (p. 59). Bergman and Weitzner (1997) characterize the Internet as an "abundance of communication opportunities" which provides "an abundance of opportunities for democratic participation" (p. 1314). Others optimistic in their viewpoint see the Internet's fundamental contribution to civics through the reinvigoration of local communities. Meeks (1997) observes that traditional, analog communities are shrinking into extinction (see Putnam's *Bowling Alone* (2000) while virtual communities of like-minded people have exploded on the plateaus of the Internet. For Meeks, these virtual communities are where citizens begin to "take back" democracy through "a kind of societal guerilla warfare" in which people will use the connective power of the Net to coalesce into civic-minded activist groups (p. 76). Other writers who look favorably on the democratic potential of the Internet see it connecting candidates with voters, and voters with other voters. These commentators observe that a principle

problem of politics a one-way, uni-cast approach to political dialogue. In its place, Westen (1998) envisions a system in which two-way communications "from candidate to candidate, from voter to candidate, and from voter to voter" will offer "significant hope for revitalizing American democracy."

More recently, Morris (2003) argues that the Internet will undermine three longstanding assumptions in political campaigns: the assumption of uniformity, repetition and density, and unilateral, one-way communication. In the place of these stalwarts of the political process, Morris sees customized Internet-based campaign messages targeted to precise demographics, in-depth presentation of political issues, and dialogue between candidates and voters. Law professor and blogger extraordinaire Glenn Reynolds recently published a book, *An Army of Davids*, which argues that information technology like the Internet are more empowering to individuals than they are to large institutions. Professor Reynolds (2006) writes, "The growth of computers, the Internet, and niche marketing means that you don't have to be a Goliath to get along. Like David's sling, these new technologies empower the little guy to compete more effectively." If anything, democracies are about the voice of the "little guy" (or gal).

Pessimism, Democracy, and the Internet

Perhaps one unifying characteristic of Internet optimists is their faith in the potential of the Internet for democratic revitalization. Though exceptions exist, they often describe what the Internet *will be* to democracy rather what the Internet *is* today. Those pessimistic toward e-democracy see nothing in the Internet of today or the future that would warrant such enthusiasm. Some suggest that society is generally enamored

with technology as a magic bullet to solve the political and social ills and point to falsely laid enthusiasm for prior technologies. R.W. McChesney (1999) writes:

> Every new electronic media technology this century, from film, AM radio, shortwave radio, and facsimile broadcasting to FM radio, terrestrial television broadcasting, cable TV, and satellite broadcasting, has spawned similar utopian notions. In each case, to varying degrees, visionaries have told us how these new magical technologies would crush the existing monopolies over media, culture, and knowledge and open the way for a more egalitarian and just society" (p. 119-120, as cited in (Nugent, 2001)).

The pessimists decry how the optimist treats technologies like the Internet as "an inkblot test into which everyone projects their desires, fears, and fantasies" (Noam, 2005, p. 57). Rather than seeing the Internet as a platform for free information and egalitarian relations that circumvents central government, they find an Internet that reproduces the patterns found in other media. Hindman, Tsioutsiouliklis, and Johnson (2003) explain that discussions of the Internet often tout increased availability and production of information, but in doing so, the authors argue that Internet optimists often confound information's *retrievability* and its *visibility*. All information on the Internet is retrievable, but only a small percentage is visible – that is, 0.01% of the Internet accounts for around 50% of all Web traffic (Sandvig, 2003). Skeptics argue that while the Internet allows for prolific production of information, ironically, it is this very characteristic that is responsible for the Internet's conservatism. Hence, equal opportunity of publication does not equate to equal exposure of viewpoints. "By way of analogy, social scientists would never assume that equality of opportunity in the economic sphere would result in an equal distribution of wealth," comment Hindman et al., "But some observers have made a similar sort of error with regard to the Web – they have taken the open

architecture of the Internet as a promise that the outcome would be similarly egalitarian" (p. 13).

Rather than viewing the Internet as a public utility owned by the people, skeptical scholars warn that since central governments do not lead in oversight of the platform, they leave the Internet to the whims of the private sector, thus forsaking the Internet's status as a commons (Schiller, 2000). Yet, other commentators critical of the Internet's democratic potential, suggest that Big Government is intensely involved in Internet governance. In *Who Controls the Internet*, Goldsmith and Wu (2006) argue that because Internet users occupy a particular place during their use, their online activities are often subject to governmental control and influence. For these two law professors, geography and physical force are "persistent" sources of order in the cyberspace.

Essentialism, Democracy, and the Internet

The optimism-pessimism axis is complemented by a second dimension of theory consisting of a range of values from essentialism to instrumentalism. Those scholars who ascribe to an essentialist position believe that within each technology is a fundamental essence that shapes the reality of its sphere of influence. The most famous essentialist is Marshall McLuhan (2003) whose trope "the medium is the message" has come to define the essentialist position. He argues that "the 'message' of any medium or technology is the change of scale or pace or pattern that it introduces into human affairs" (p. 203). McLuhan uses the example of electric light to illustrate where the meaning in media lies:

> The electric light is pure information. It is a medium without a message, unless it is used to spell out some verbal ad or name...Whether the light is being used for brain surgery or night baseball is a matter of indifference. It could be argued that these activities are in some way the 'content' of the electric light, since they could not exist without the electric light. This fact merely underlines the point that 'the

> medium is the message' because it is the medium that shapes and controls the scale and form of human association and action. (p. 203)

In brief, McLuhan argue that the true "content" of a message is influenced not only by what is sent but also by the way it is sent (Lunenfeld, 1999). The essence of the medium matters. Essentialism is most often associated with technological optimism. As we saw with many of those scholars optimist about the democratic possibilities found on the Internet, make their case based on the fundamental properties of the technology. The Internet's open standards and architecture affords free, cheap, and egalitarian discourse for the common person. As Morris (2003) says, "The essence of the Internet is that it permits you to speak, that it makes a monologue into a dialogue and the essence of the media, the message of the media of the Internet is interactivity and dialogue..." (p. 15). In other words, the essence of the Internet is agency. This is the Internet's *message*, not its "content" (ranging from political blogs to pornography), but the scale, pace, and pattern that it introduces into human activity. Thus, for many optimists, immediate evidence is not needed to justify the enthusiasm for the Internet's democratic possibilities.

Instrumentalism, Democracy, and the Internet

Our last spectral endpoint, one that finds itself as the polar opposite of essentialism, is that of instrumentalism. This position claims that technologies are neutral instruments whose value is defined through their uses. McLuhan (2003) describes instrumentalism as "conventional response to all media, namely that it is how they are used that counts" (p. 207). Many placing the weight of the evaluation of technology on its use and not some fundamental property, instrumentalists prefer to examine instances and uses of technology as case studies for evaluation. In the context of our conversation

about the democratic potential of the Internet, instrumentalists are often those who either remain neutral about the e-democracy or become pessimistic or skeptical of claims about the role of the Internet to revitalize modern democracies. Joint's (2005) recent comments illustrate instrumentalist thinking in the context of the Internet: "... internet technologies are just that, technologies. No technology is good or bad, democratic or undemocratic. In terms of its political effect, the internet is simply what we choose to make of it. It is vital therefore that the internet is used eLiterately, to the right effect" (p. 81-82). In "How the Internet Did Not Transform Russia," Rohozinski (2000) describes how "the 'new dog' of the Internet was adapted and used to perform the 'old tricks' inherent to the Soviet system." (p. 337). According to Rohozinksi's account, the Internet was colonized by state leaders, making the technology a conservative tool for state control. A research group recently found that terrorist networks enjoy use of the Internet because of its many advantages to underground organizations: ease of use, anonymity of posting, large potential audience, and lack of oversight and regulation (Qin, Zhou, Reid, Lai, & Chen, 2007). In their analysis of the "Dark Web," Qin et al. found that terrorist/extremist websites created highly sophisticated web presences, complete with multimedia, online forums, and chat rooms. Such accounts strengthen the instrumentalist perspective on technology.

The Limitations of the Two-Axes Approach to E-Democracy

The two axes described in the preceding paragraphs are not able to offer a plane onto which perspectives about the viability of e-democracy can be fully mapped. They do, however, offer a helpful platform to plot much of the current scholarship on e-democracy. As we have seen, two quadrants are populated more often than not – the

essentialist-optimist quadrant and the instrumentalist-pessimist quadrant; that is, some argue that Internet is by its very design democratic, whereas, many others contend that in its use the Internet does not impact the democratic process. Yet, by mapping the division of views found in the field, have we really addressed the complexity of the question as revealed by a brief examination of Held's seven sites of power?

A site-by-site evaluation of the Internet does not allow for simple conclusions about the democratic utility of the Internet. This is not surprising, as the Internet is an incredibly broad set of practices spread across local context and cultures around the world and "democracy" embodies many values, ideals, and activities. Within this variation, however, a few themes did emerge during the course of this evaluation.

First, there were a few factors which almost universally dampen the democratic impact of the Internet (no matter which site of power we consider). A consistent constraint to the democratic value of the Internet is found in inconsistencies in access. With descriptive statistics revealing wide-ranging Internet penetration rates across racial, socioeconomic, and national groupings, the power of the Internet to inhibit or enhance democratic experiences is applied unevenly. While the Internet may have the potential to be supportive of developing and mature democracies, the pragmatics of access limit the realization of any such potential.

Second, while the Internet is a "virtual" entity, those that use the Internet are still grounded in a particular socio-political context. Our bodies are still subjugated to the realities of national borders and local policy. As has been the pattern for this evaluation of the Internet, repressive societies offer fewer chances to use the Internet for direct

democratic activity, which may explain why Internet consultant Nan Dawkins has argued:

> While ensuring access certainly impacts the internet's potential as a change agent, it is important to remember that simple access is not enough. Giving a man (or woman) a laptop and a cheap connection is not sufficient to change his/her plight. The internet is a tool with some potential, but it is probably not within the top 100 factors that can drive significant change in the world (J. Q. Anderson & Rainie, 2006, p. 68).

These two dampening factors do not make the Internet irrelevant to democracy; rather, they only add caution to any evaluation of the Net's democratic attributes. As an exploration of the Internet across the seven "Sites of Power" revealed, even with the limitation of access and the bordered nature of the Net, the Internet has been used in democratic ways to support democratic causes. Perhaps the balance needed for evaluating the Internet can be found in Held's (1995) observation: "It does *not* follow, it should be stressed, that democracy is an all-or-nothing affair...democracy must be understood as a continuum across which particular rights *within* clusters will be more or less enforced, and *different* rights clusters will be more or less entrenched" (p. 191).

Held's comprehensive approach to discussion of democracy is rarely achieved in Internet studies, as the above review reveals. Often, those writing about the Internet and democracy conceptualize either entity by a single dimension. They elevate a few attributes of the democracy or the Internet above all others, and then pass unnecessarily definitive judgment on the Internet and democracy. If they are *procedural* democrats, then they may enthusiastically hail the Internet's democratic value to the extent it supports the methods and materials for democracy. If they are *philosophical* democrats, they may base their evaluation on the kind of democratic experience the Internet offers. If they are *essentialists*, they evaluate the architectural potential of the Internet, but if they

are *instrumentalists*, they only consider the Internet as it is experienced in the present. Each of these approaches reduced the Internet and democracy to simple definitions, but both the Internet and democracy are complex sets of practices, beliefs, and values. As such, a more complex exploration of e-democracy is required.

The remainder of this chapter reaffirms that the debate about the civic virtue of the Internet is clouded by confusion between different realizations of the "Internet" and an often narrow conception of "democracy." It would appear that there is not one Internet, but many; there is not a singular notion or expression of democracy, but many.

The Internet and Democracy: Becoming and Plurality

In *The Public and Its Problems*, Dewey (1991) criticizes the popular view that democracy springs up from a single root toward a finite end. For Dewey, it is not a "movement [that] originated in a single clear-cut idea, and has proceeded by a single unbroken impetus to unfold itself to a predestined end, whether triumphantly glorious or fatally catastrophic" (p. 83). Rather, Dewey argued that "political democracy has emerged as a kind of net consequence of a vast multitude of responsive adjustments to a vast number of situations, no two of which were alike, but which tended to converge to a common outcome" (p. 84). Democracies can grow in common soil, or spring up in wildly different contexts as they are fed by diverse sources. Democracies have no natural climate or habitat. Certainly, there may be common characteristics found between different installations of political democracies, some factors that are certainly important to growing this type of community. However, Dewey's admonition against discussions of a "democracy" versus "democracies" is characteristic of his thinking about binary

categorization. As he wrote in *Experience and Education*, "Mankind likes to think in terms of extreme opposites. It is given to formulating its beliefs in terms of Either-Ors, between which it recognizes no immediate possibilities" (Dewey, 1987, p. 17). By arguing against a single representation, Dewey was breaking down the ability of commentators to speak about democracy vs. non-democracy. Such a distinction, in Dewey's eyes, is false.

Dewey's emphasis on democracies over democracy is a distinction that throws into doubt the divisions many scholars make as they discuss the democratic value of the Internet. When these scholars, commentators, and pundits discuss the democratic utility of the Web, to which democratic ideal are they referring? What will make for a democratic Internet: is it virtual communities that tie like-minded people around the country together; is it increased information about candidates, resulting in better voter turn-out and local political activity; is the egalitarian distribution of ideas through the open link structure of the Net? In other words, which of Held's sites of power do scholars include when they debate the degree of a democracy?

Dewey's observation that democracy can take many forms illustrates the problem that can occur when authors isolate one sense of democratic activity over all others as the single basis for evaluation. For example, Sandvig (2003)and Hindman et al. (2003) argue that the Internet will be democratic if and only if it supports the egalitarian distribution of ideas through use. In other words, their democratic Internet requires a space where a few sites dominant the trafficking ideas. But as these authors point out, the 0.01% of websites that receives 50% of all Internet traffic became visible because many sites link to these few. Is that not also a form of democracy in action? Google would argue that by

counting links between sites they are leveraging the democratic nature of the Internet. Who is correct depends on the perspective one takes toward what is a democracy, and in this sense, both are right.

Democracy – A Work in Progress

This dispute about the democratic possibilities that lie in the Web can also be attributed to an improper understanding of the status of democracy. Dewey (1991) writes, "[Democracy] is an ideal in the only intelligible sense of an ideal: namely, the tendency and movement of some thing which exists carried to its final limit, viewed as completed, perfected. Since things do not attain such fulfillment but are in actuality distracted and interfered with, democracy in this sense is not a fact and never will be" (p. 148). Democracy never is; rather, it is a work in progress. It is a goal, not a standing. Once a political form is established, it is subject to "a vast series of adaptations and responsive accommodations, each to its own particular situation" (p. 84). From Dewey's standpoint, forms of government are always evolving and adapting, like biological organisms, in order to meet the demands of their environment. This sense evokes a notion of grow*ing* over grow*n*. For Dewey, democracy is the activity of becoming more than it is a being – as Cornel West (2004) reflects, "democracy is more a verb than a noun – it is more a dynamic striving and collective movement than a static order or stationary status quo". Saito (2002) reminds us that Dewey's conception of democracy is paradoxical in nature, "as *both attained and unattained*; his sense of democracy not as some fixed *telos*, but rather as something forever to be worked towards, never finally to be achieved" (p. 248). For scholars like West, Saito, and Dewey, democracy is always a

work-in-progress, "a pattern of moving towards an ultimate goal to a metaphor of 'traveling [as] constant arriving'" (Dewey (1983) as cited in Saito (2002)).

This line of Deweyian thought raises another problem with the nature of inquiry in Internet studies regarding e-democracies. Whether they optimistic or pessimistic, essentialist or instrumentalist, most scholars paint e-democracy as that which is attained, attainable, or unattainable. Most accounts do not capture a sense of growing and movement in their representations of democracy on the Internet; they are more of a status check – are we there yet or not – when there is no "there" to get to. The complexity that Dewey brings encourages a form of scholarship that makes small statements about a big phenomenon (for example, discussions of political blogs) than large, sweeping evaluations of a socio-technical as large as the Internet. Such caution is particularly prudent when one considers how volatile the atmosphere of the Internet can be.

The Plurality of the Internet

Perhaps this tension could be partially alleviated with a simple acknowledgment: the phrase "the Internet" improperly represents this knowledge network monolithically and singularly, when in practice there are many Internets. The Internet common to our thinking is a large, open discursive network of information, a platform for connections between people, organizations, and ideas. It is the "Deep Web," the Internet of a "thousand plateaus," the "essential" Internet. Certainly, this Internet exists, but there is also the Internet *in effect*. This is the Internet that is realized in everyday surfing. It is the popular and visible parts of the web, the commercial sites that dominate the search engine listings and garner the vast majority of user activity. This is the "Shallow Web," the form of the Internet described by many instrumentalists, the realization all digital

information is filtered (S. Johnson, 1997). The difference between these two Internets is much like the difference between the known and unknown Universe, or at least the difference between commercial television and public television. The Shallow Web mimics television's reductive presentation of the knowledge universe; whereas, the Deep Web leverages the rhizomatic structure of hypertext to create a medium that is worthy of labels such as revolutionary and evolutionary. The Deep Web is also the Internet that offers the most *potential* for democratic activity, but it is through the Shallow Web that so many of these promises fail to materialize.

The distinction between the Deep and Shallow Web draws partial inspiration from one of Plato's central ideas: the Archetype. Plato argued that in order to understand anything in this world – colors, truth, beauty – humans must become familiar with many examples of those objects in the world. For Plato, the artifacts of this world are partial derivatives of an Archetype or Form. So if we want to know what is beautiful, we should examine many objects we find beautiful (flowers, sunsets, the Fall colors) as a way to gain an appreciation for the ideal of Beauty. In this way, "the Platonic perspective requires the philosopher to go *through the particular* to arrive at *the universal*" (Tarnas, 1991). By distinguishing between the Shallow and the Deep Web, I have assumed the existence of an archetypal Internet – an ideal space, one that is open, communal, discursive, and free from any existing power structure. No such place exists; yet, this is the Internet that many pundits and commentators aspire to. We recognize the architecture of this Internet and express our enthusiasm for its dynamic hyperlink and open structure, but here in the shadow lands, the Deep Web is not the Internet we often seen. Our

Internet is the Shallow Web, the commercialized Internet, the Internet of msnbc, msn, yahoo, and Google.

The confusing struggle between the Shallow and Deep Web is what creates some of the disagreement about the Internet's democratic potential in Internet studies. Those that trumpet the Internet's democratic potential have narrowed their conceptualization of the Internet to the Deep Web. When thinking of the Deep Web, it would be easy to see the Internet as a space for the "free discourse" for which Dewey (1966) advocates. The Deep Web represents the means of dispersion of knowledge that Dewey (1991) sought – one that is a "systematic, thorough, and well-equipped search and record" (p. 179). However, the Internet in practice is the Shallow Web. It is the commercial, infotainment version of the Deep Web. Those that advocate that the Internet is an irrelevant player in the evolution of democracies around the world often cannot see past the Shallow Web to its deeper form.

The Nature of Space

The nature of the Internet as a "space" (as it is often described) may best explain its bifurcated identity. In "Space, Power and Knowledge," Foucault (1993) outlines the relationship between architectural spaces and the values they promote. Foucault rejects the notion of an ideal space, one that perfectly, reliably, and consistently promotes any social value, whether desirable (liberty) or undesirable (oppression). He writes, "...I do not think there is anything that is functionally – by its very nature – absolutely liberating. Liberty is a *practice*" (p. 135). Foucault is not precluding the notion that certain spaces can promote certain social values, but rather that no space can guarantee any particular

social value, desirable or not. "This is not to say that the exercise of freedom is completely indifferent to spatial distribution," argues Foucault, "but it can only function when there is a certain convergence; in the case of divergence or distortion, it immediately becomes the opposite of what was intended" (p. 136)." Consequently, even if the Internet were designed as a platform to share ideas without commercial interference, the design of space itself does not guarantee the realization of any value. Designing a Deep Web may still result in a Shallow Web, just as one may still find the flowers of "resistance, disobedience, and oppositional groupings" in the most restrictive environments, as in concentration camps. For Foucault, "nothing is fundamental" (p. 136). This includes spaces designed to be fundamentally restricting and fundamentally liberating. The Internet, whose means of production and distribution are drastically different than other media including television, radio, and print, can be understood as a space that is not indifferent to freedom, democratic discourse, and liberty; yet, it also is one in which opposing values circulate with regularity. When we look at the Internet, we see glimpses of both a Deep and Shallow Web.

The division between a Deep and Shallow Web is in many ways, an extension of critical debates about the very nature of technology itself. They represent opposite ends of the essentialism-instrumentalism axis. The Deep Web is the ideal Web, the *essential Web*; whereas the Shallow Web is the realized Web, the *Web in-effect*. The position that Foucault helps his readers find is the seat between the extremes, one that recognizes the predisposition of the design and the contrary realization of its purpose through its use. This leaves us with an Internet that is similar to Andrew Feenberg's (1995)

characterization of all technology, entities that are best seen as "neither determining nor as neutral" (p. 4).

Looking Back

Is democracy a worthy topic of inquiry? Dewey responds to this question with a single question of his own: "Can we find any reason that does not ultimately come down to the belief that democratic social arrangements promote a better quality of human experience, one which is more widely accessible and enjoyed, than do non-democratic and anti-democratic forms of social life?" (1987, p. 34). In this statement, Dewey provides not only a justification for democratic societies, but also for continued inquiry about democracy. For Dewey, democracy was ultimate good for a pragmatic society.

This chapter was meant to continue the conversation that Dewey started about democracies and technology so many years ago. In it, I found that the differences in perspective about e-democracy offered in the current scholarship can be traced to varying understandings about the nature of democracies, the role of technology in democracies, and the nature of the Internet itself. Many writers I surveyed settled on a fairly narrow notion of what a democracy is and then evaluated either the Internet as practice or the Internet as potential. There conclusions about the democratic value of the Internet fell predictably along a simple two-dimensional grid.

Through an analysis of the Internet guided by Held's (1995) sites of power, I suggested that current research about the Internet and democracy must assume inclusive understandings of both democracy and the Internet. As its history reveals, democracy is a complicated, contested term, and the Internet is a complex set of economic, social, and political relations. As such, e-democracy scholars should consider emphasizing the

plurality of the Internet and democracy. Plurality in democracy means considering multiple facets of democratic living – physical, emotional, economic, political, and so forth. The plurality of the Internet requires that scholars divide their commentary between what the Internet is today in effect (Shallow Web) and what they see in the future via the Internet's architecture, core technologies, and design (Deep Web).

The Internet, in its current bifurcated state, is not the democratic space many wish it to be (though signs of democratic activity exist across every site of power); yet, it may be "a matrix that gives birth to our ideal aspirations" (Saito, 2002, p. 254). Like Dewey's democracy, both ideal and also unperfected, the Internet is very much a democratic work in progress. Dewey (1991) felt that the equitable distribution of knowledge was fundamental to the formation of public opinion; yet, he also recognized that though "this marks one of the first ideas framed in the growth of political democracy ... it will be one of the last to be fulfilled" (p. 176). It may be that the growth of the Internet's democratic role is stepwise rather than an instant revolution. Yet, the potential is there, even in the heart of pessimism there is hope, as illustrated by the conclusion to Noam's (2005), "Why the Internet Is Bad for Democracy":

> The Internet does not create a Jeffersonian democracy. It is not Athens, nor Appenzell, nor Lincoln-Douglas. It is, if anything, less of a democracy than those low-tech places. But, of course, none of these places really existed either, except as an ideal, a goal, or an inspiration. And in that sense, the expectations vested in the Internet are a new link in a chain of hope. Maybe naïve, but certainly ennobling. (p. 58)

Both positions, commentators of Shallow Web and the Deep Web, must recognize an important distinction in democratic development in virtual spaces: the Internet that is a place of *becoming* and *growing* toward democratic utility, not because it has yet to realize its democratic potential, but because there is no "there" to get to. Dewey reframes

the question asking to what end do we grow to one that asks by what means do we grow. It is the difference between "growth toward what?" and "growth how?" This should quite properly change the nature of the conversation from one of status to one that measures progress and slope.

CHAPTER 9
LESSONS FROM LINKS

We do not ride on the railroad; it rides upon us.
Henry David Thoreau (1854), *Walden*

This dissertation represents an exercise of extended reflection on the philosophical, sociological, historical, and psychological attributes of the Internet, as conceived as a collection of technological artifacts, people, and practices. Looking back to the first chapter, my stated purpose for this dissertation was to examine the real-life implications of a virtual phenomenon. To do so is to mirror the reversal of thinking about technology that Thoreau models in *Walden.* Thoreau was making an appeal to a simpler time when individuals did not aspire to accelerate "commerce, and export ice, and talk through a telegraph, and ride thirty miles an hour..."; however, my intention is not to lament recent technological developments. The romanticization of rust is just as problematic as the hype of hypertext. What is valuable about Thoreau's words is that they do encourage observers of society and technology to examine the relationship between the two, and the various factors that inform the development of each. Translated to today's "information age," perhaps Thoreau can be paraphrased, "We do not surf the Internet; it surfs upon us." This adaptation of Thoreau does properly emphasize the direction of analysis for much of this dissertation, though as I argued in Chapter 2, technology development is not best conceptualized as vectors of force, but as spheres of influence.

In the preceding chapters, I examined how the Internet changes our relationship with knowledge, identity, community, democracy, and language. For an epilogue, I choose not to summarize the work (it may be better to return to the introductory chapter

for a chapter-by-chapter review); rather, I include a variety of general lessons this dissertation offers. These "lessons from links" include: (1) the difficulty of theorizing on a developing phenomenon; (2) the difficulty of theorizing on an established phenomenon; (3) the importance of technology theory (specifically Internet theory); (4) implications of this work for internet theory; and (5) the implications of this dissertation for education.

Lesson #1: The Difficulty of Theorizing on a Developing Phenomenon

> Remember the anecdote of the wealthy recluse whose butler brought in the morning paper, took it to the basement, and retrieved the paper from the same day 20 years earlier. The only way to tell what was truly important, he said, was to see what was relevant 20 years after the fact (Rogerson, 2005, p. 238).

Kenneth Rogerson's words serve as a reminder of the difficulty of studying anything early in its development. Though many books, articles, and other forms of scholarly activity have been dedicated to the impact of the Internet, there is a sense in most published works that no one is really sure what will be relevant even ten years from now, not to mention twenty. Early studies of Internet use focused on MUDs (multiplayer, Internet-based, role-playing games), chatrooms, "flaming," bulletin boards, news groups, and text-based browsing – a collection of technological practices that seem antiquated when compared to Web 2.0 technologies (blogs, RSS feeds, peer production, podcasts, social networking, etc.). Certainly, early pioneers studied an Internet far different from the Internet of today; however, today's research runs the same risk when the Internet community moves to Web 3.0, or whatever we call the next big development on the Internet. We do not have the luxury of Rogerson's wealthy recluse, waiting twenty years to see what matters. For this reason, this dissertation was designed primarily as a general treatment of the issues fundamental to hypertext and a connected

information network of a global scale, a collection of chapters that address issues that I believe lie at the core of the Internet and those not as likely to change. Though I have consciously tried to minimize specific examples or discuss particular technologies, a certain amount of specificity, such as Google's position in the Internet ecology or statistics pertaining to Internet penetration rates, cannot be avoided. However, as Chapter 4 argues, the importance for Internet studies is not to understand particular technological practices (whether they be Yahoo vs. Google's search algorithms or Facebook vs. MySpace's social network design), but to provide a critique of a particular practice on the Internet, such as the search engine as a producer of knowledge through a circuit of exchange and the role of the social networking site in identity construction. Had this dissertation been written ten years ago, the discussion of power relations and the search engine could have been included, though the search service Altavista would have likely been the subject of study rather than Google. The Internet technology may change, but not necessarily the principles that lie beneath them.

The exciting aspect of the Internet is that it is always changing, but this is also its challenge as well. The Internet is a technological representation of Donald Schön's (1973) "loss of the stable state," his belief that our society and its institutions are in the continual process of transformation. It is a reframing of Heraclitus's observation that one cannot step in the same river twice. In the end, the problem and opportunity of studying the Internet is its dynamicity.

Lesson #2: The Difficulty of Theorizing on an Established Phenomenon

The irony of the state of Internet studies is that while it lacks a mature research agenda or a stable platform for study, the Internet has already become a common fixture in the lives of millions of people around the world. With regular contact with the Internet, users develop a relaxed familiarity for the technology and with it, develop a number of hidden biases, assumptions, and practices. One of the more valuable contributions that a theoretical examination of technology can provide is a fulfillment of Geertz's (1973) mission to make the familiar, unfamiliar. Ubiquitous technologies become invisible. As Steve Johnson (1998) once observed: "Technology. The word has become so commonplace in our culture that we take it for granted, unless, of course, technology doesn't do what we expect it to do (like when the soda machine takes our last quarter or the electricity in our house goes off)" (p. 75). When users take a technology for granted, the values built into or produced by the technology through its use often become assumed, expected, or perceived as "natural." Lost is our sense of surprise or imagination for the tool's effects. Consequently, a periodical critical reevaluation of the place of technology in our lived experiences is beneficial. A critical "retelling" of the Internet is to tell the hypertext story again, but in a way that both affirms and challenges past efforts to understand the Internet, and in the process, make hidden assumptions visible. Chapter 4 revisits the notion of power relations on the Internet, and through that discussion, a structural understanding of power is challenged as well as the notion of "value-free" information on the Net. In exploring the nature of credibility in online spaces, Chapter 7 problematizes the notion of "credibility" online, and with it, the utility of algorithms taught to evaluate website content. These are but two examples of critical retelling designed to lead to a de-familiarization of the Internet.

So familiar has the Internet become that many of the fundamental assumptions of the Internet often go unnoticed and unchallenged. In many ways, we take for granted the implications and influence of the Internet in our daily lives. As a member of the unconnected world, Vannevar Bush (1945) expressed with awe the potential for his *memex*, an early hypertext concept, to meet the informational needs of scientists. His description reminds us exactly what promise the Internet can provide for self-directed learning:

> The owner of the memex, let us say, is interested in the origin and properties of the bow and arrow. Specifically he is studying why the short Turkish bow was apparently superior to the English long bow in the skirmishes of the Crusades. He has dozens of possibly pertinent books and articles in his memex. First he runs through an encyclopedia, finds an interesting but sketchy article, leaves it projected. Next, in a history, he finds another pertinent item, and ties the two together. Thus he goes, building a trail of many items. Occasionally he inserts a comment of his own, either linking it into the main trail or joining it by a side trail to a particular item. When it becomes evident that the elastic properties of available materials had a great deal to do with the bow, he branches off on a side trail which takes him through textbooks on elasticity and tables of physical constants. He inserts a page of longhand analysis of his own. Thus he builds a trail of his interest through the maze of materials available to him.

To Bush and his readers in 1945, such flexible interactions with a vast knowledge network must have read like science fiction, lumped in with flying cars, houses on the moon, and robotic maids. Bush's prescient article anticipates the information age, one in which "navigation may well be the main form of literacy for the 21st century" (Brown, 2000). Reading his account of how knowledge should be organized reminds us of what is truly evolutionary about the Internet. He describes what will be the experience of the unforeseen Internet for the learner, like a Vygotskian (1978) tool that extends our abilities beyond our biological limitations.

Another unlikely candidate whose pre-World Wide Web reflections add to an appreciation for the novelty of the Internet is French philosopher Michel Foucault. Foucault (1996) shares his dream for the development of an open-access information system, and in doing so, reminds readers in this information age of the unique informational taxonomy found on the Web:

> I dream of a new age of curiosity. We have the technical means for it; the desire is there; the things to be known are infinite; the people who can employ themselves at this task exist. What are we suffering from? From too little: from channels that are too narrow, skimpy, quasi-monopolistic, insufficient. There is no point in adopting a protectionist attitude, to prevent "bad" information from invading and suffocating the "good." Rather we must multiply the paths and the possibility of comings and goings... Which doesn't mean, as is often feared, the homogenization and leveling from below. But on the contrary, the differentiation and simultaneity of different networks. (p. 305)

It would seem that the Internet answers Foucault's call for a network that offers multiple paths and seemingly unlimited "comings and goings," and with it, his understanding of distributed power. His words also put into perspective concerns addressed in Chapter 7 (Credibility at a Click) regarding "information pollution" (to borrow from Jakob Nielsen). Most importantly, Foucault's dream serves as a second example of a scholar's anticipation for the possibilities found on the Internet. To complete this exercise in Internet de-familiarization, I conclude by turning to one of the earliest reflections on the experience of the Internet available – Robert Wright's New Republic piece from 1993, entitled "Overhearing the Internet."

Wright (1993) tells his readers that he was just returning from his first "mission to cyberspace, where I logged a couple of dozen hours on the Net (as we say there)." Wright reports back to his readers his adventures in this strange place they "probably never actually [have] been..." Cautiously optimistic, his work represents a fresh look at

the Internet as it was first starting to make inroads into public use. Wright gives his readers a description of his encounter with some very basic Internet technologies:

> [The Internet's] dimensions are many and diverse. Internet Relay Chat offers real-time written conversation--it makes your monitor look like an unfolding screenplay, with you speaking one of the several parts. File Transfer Protocol lets you enter computerized archives all over the world and download zillions of files. I could go on. But the usenet newsgroups are (arguably) the most socially momentous of the Net's dimension, and they're where I spent my time....Within each group is a changing mix of distinct conversational lineages ("threads"), each labeled with the subject heading of the posting that started it. As of late August in the soc.culture.celtic group, you could choose to associate with one or more of half a dozen crowds, including the s crowd, the crowd, the f crowd and the {Looking for name of Dentist in Belfast N.I.} crowd...When you read a posting, its lineage appears as a family tree in the corner of the screen. If three people respond to the {Scottish Stereotypes} posting, those responses are its "offspring"--siblings of one another--and each may then have offspring of its own. You can navigate these lineages, go from one posting to its parent, its offspring, its younger or older sibling or straight to the root or the outmost leaf.

Wright's experiences are based on an Internet that pre-dates graphic browsers and the World Wide Web; yet, his account demonstrates an enthusiasm for open-publication standards and a global network of information. Cautious not to be taken in by the latest "fad," Wright finds plenty to be pessimistic about when it comes to life online. He does not foresee the Internet transforming democracy or the metaphysics of human existence; yet, his report from the frontiers of cyberspace validates the cultural significance of the experience and the value of extending physical reality with a virtual one – if only to find a dentist. Reading his words now, they seem anything but revolutionary, but at the time (and this is the point), they were. It is with Bush's same sense of imagination that Wright explores this new medium, and it is good to remind ourselves about what life was like B.B. (Before Broadband). Reflecting back allows us to look forward.

Lesson #3: The Importance of Theorizing about Technology

This dissertation was an attempt to reinvigorate the novelty of the Internet, and this chapter seeks to find closure by returning to the importance of theorizing about technology. Philosophy of technology is not a field of rich tradition, despite the recent attention it has received by twentieth century philosophers. Philosophy is an activity that finds its roots in the inquiry of the early Greeks several millennia ago, and has historically consumed itself with those questions fundamental to the examined life – what is real, what is true, what is right, and what is good or beautiful. For thousands of years, the answers to these questions have varied, or philosophers' conclusions have remained constant but their justifications have differed. Given the long history and rich tradition of philosophy, it should not be surprising that philosophers have been slow to speculate on the matter of technology (a field characterized by change).

Scharff and Dusek (2003) offer several reasons as to why the philosophy of technology has historically been undertheorized. As they suggest, some intellectual traditions (including the European positivists, Anglo-American empiricists, and French Enlightenment thinkers) recognized only the possible good associated with technology. Perhaps this early enthusiasm for technology explains the heightened criticality of more recent philosophers toward technology, like those in the Frankfurt School, as a reaction against such unguarded optimism. These authors also suggest that science has subsumed technology and "speaks" for technology on matters of epistemology, axiology, and metaphysics – a conclusion that others (Idhe, 1993) have also put forward. Lastly, Scharff and Dusek persuasively argue that technology has been undertheorized because the early Greeks, such as Socrates and Plato, set a precedent by differentiating between technical/craft/practical knowledge and a higher form of knowledge that is contemplative

in nature. To create craft is not as high a form of life as to contemplate principles and abstract knowledge. I qualify their conclusion with the acknowledgement that early Greek philosophers did not wholly ignore technology, particularly the values embedded within technology. Aristotle argues that inside technology (*techne*/craft) are the values of its designers. As he says, "Every craft is concerned with coming to be; and the exercise of the craft is the study of how something that admits of being and not being comes to be, something whose origin is in the producer and not in the product" (Aristotle, p. 6.32.10). Surely Aristotle was one of the first to examine the nature of the *Homo faber,* the human designer.

Yet, while references to technology exist in Plato, Aristotle, and other thinkers foundational to the Western Mind, their treatment is far from comprehensive. It was not until Francis Bacon (1561-1626) and the scientific revolution that technology found its way into mainstream philosophical discourse. Bacon's axiom, "knowledge is power," signaled a shift in the purpose of knowledge. For the Greeks, the purpose of knowledge was to know – knowledge is the fodder for the contemplative life. Once attained, it was to be mediated upon. For Bacon and those that followed, "the purpose of knowledge is not simply to know, but to change things" (Ihde, 1993). As society came to value *technique*, philosophers began to take notice of technology. It is a long journey from Plato to the present-day's technological landscape.

As a recent addition to the technological landscape, the Internet and the theory that surrounds it are understandably underdeveloped. Too often, the ritualistic observations of promise common to educational technology, eCommerce, and political democracy dominate conversations about the Internet and its significance. Yes, the

Internet represents a remarkable shift in how humans organize knowledge, but as a knowledge network, it is also influenced by the pre-existing social practices of those that use it. Recall Dewey's (1987) explanation: "...we live from birth to death in a world of persons and things which in large measure is what it is because of what has been done and transmitted from previous human activities" (p. 39). The Internet shapes us; we shape it.

Dewey's work highlights the importance of being intentional about one's *experiences* with and through technology. Dewey places particular emphasis on how experiences shape both our present and future realities. Dewey (1987) uses a familiar example in *Experience & Education* to illustrate this point:

> Moreover, every experience influences in some degree the objective conditions which further experiences are had. For example, a child who learns to speak has a new facility and new desire. But he has also widened the external conditions of subsequent learning. When he learns to read, he similarly opens up a new environment...He renders himself more sensitive and responsive to certain conditions, and relatively immune to those things about him that would have been stimuli if he had made another choice. (p. 37)

Dewey recognizes that an experience can change the quality of our present condition, but also exerts significant influence on our future experiences. He uses experiences to explain more than a direction of the personal life, but the direction of society itself. For Dewey, technological artifacts impact not only the kinds of experiences we have personally, but the experiences we have in our larger social context. They shape and make societies. Dewey baldly claims that the differences between "civilization" and "savagery" are principally found in the way technological artifacts structure our experiences. Take away our roads, power, electricity, and rapid

transportation and society would temporarily assume a more "barbaric" form (Dewey, 1987, p. 39).

For Dewey, experiences form the foundation for the structure of society. Ten years ago, home Internet was for the early adopter and the avant-garde geek. Now, most television and radio commercials, print ads, billboards, and business cards offer website and email addresses. What used to be the haven for hobbyists is now a requirement for the appearance of commercial credibility. Who would attend a university without a professional online presence? The heavy use and reliance on the Internet creates a certain experience, or more specifically, a particular type of relationship between people and their information. Understanding this relationship is critical in answering historical questions (what has happened?), but also in developing a reasonable course for the future (what will happen?).

Internet theory is important because how we think about anything is important. As Jerome Bruner (1986) argued in his conclusion of *Actual Minds, Possible Worlds* that once theories are accepted into the prevailing culture, they no longer simply describe; rather, they "give a social reality to the processes they seek to explicate to a degree, to the 'facts' that they adduce in their support" (p. 134). Misinformed theories can shape the world in undesirable ways, as we have seen in educational policy, national politics, and global economics. Any theorization of a technology must balance technology's promise with technology's problems.

Lesson #4: Implications for Internet Theory

As I argued in the introduction of this dissertation, the opportunity and challenge of Internet studies are its lack of history, tradition, and calcified beliefs. Recall Steven

Jones' keynote address to the 2003 Association of Internet Researchers Conference: "There is not yet a canon; there are not departments and degrees...There are not yet methods specific to Internet studies. Perhaps most importantly, there is not yet a theoretical structure or exploration of Internet" (p. 233). Some may lament the ill-defined status of Internet studies, but I believe it to be an exciting field ripe with opportunity. The years following Jones' keynote have been witness to rapid growth in the number and diversity of scholarly activity centered around the Internet. I offer this dissertation as part of the growing momentum of individuals interested in the social, psychological, economic, and philosophical significance of this phenomenon. What follows are the implications of this dissertation for the nascent field of Internet studies.

The Plurality of the Internet

I have argued in several chapters for the plurality of the Internet. Many of the current tensions and debates within Internet studies stem from a general disagreement about what the Internet is. What is the democratic value of the Internet? Does the Internet represent a revolution in our relationship with information? Is the Internet a technology of the people, or another medium domesticated by government and corporate interests? Our answers may depend on which Internet we consider. Are we evaluating the Internet common to our thinking, which is the egalitarian Internet, an open-access information network with seemingly unlimited potential for the free publication of ideas with negligible gatekeeping? In Chapter 8, I described this Internet as the "Deep Web," and it is this Internet of which those most enthusiastic for this technology often speak. However, there is the matter of the Internet in practice, the Internet *in effect*. This is the Internet that is realized in everyday surfing and sharing. It is the popular and visible parts

of the Web, the commercial sites that dominate the search engine listings and garner the vast majority of user activity. This is the Internet whose website traffic obeys "power law" distributions. It is what I termed in Chapter 8, the "Shallow Web." This division of Internets does not fully describe the plurality of Internets. To be sure, there are other ways to conceptualize the Web's multi-dimensional characteristics. The distinction between Shallow and Deep Web is meant to illustrate that some conversations about the Internet unnecessarily characterize it one-dimensionally. Likely as the Internet continues to grow in richness of experiences and participation (narrowing the digital divide within socioeconomic groups and between developed and developing world), the need for multiple Internets will become increasingly clear. I believe that the activity of "discovery" of other Internets to be an exciting course of research and helpful in framing the controversies that surround the technology.

The Value of Multiple Methods

A second implication of this dissertation for Internet studies comes in how we may approach Internet studies. When studying a global, cross-cultural phenomenon like the Internet, the use of theoretical bricolage is helpful (Levi-Strauss, 1974). The Internet is a complex set of practices: social, economic, personal, communal, and global. As such, this study drew on perspectives of philosophers, sociologists, psychologists, anthropologists, linguistics, economists, historians, and political scientists to unpack the Internet's complexity. The power of multiple theories and perspectives allow for a wider range of questions to be asked and more inclusive answers to be given. Even if the questions that we ask are narrower than what I have offered here, the use of multiple frames may be helpful because as many of these chapters have shown, it is difficult to

separate the political, economic, legal, epistemological, and psychological effects of the Internet from each other. This advocacy of theoretical bricolage is not a novelty nor unique; rather, it is a confirmation for those informed observers of the Internet who already have cast their nets wide to capture the richness of the Internet as a project. This list includes many of the scholars referenced throughout this dissertation.

Direction for Future Research

A final set of implications of this dissertation is found in setting the direction for future research in Internet studies. Certainly, a field as undeveloped as Internet studies should offer a rich future of meaningful research. Many questions have yet to be fully developed and others that have yet to be asked of the Internet. One could take any of the questions posed in this dissertation and perform extensive further research, but what follows are what are some of the more provocative questions now and in the future.

Given the instability of the global political landscape, it is important for scholars studying the Internet to continue to explore, monitor, and interrogate its democratic value. What is the future of this bordered Internet? How successful will closed nations be in trying to leverage the Internet for maximum economic benefit while minimizing its political effects? In what ways will the Internet be used in the free elections of the future? The Internet is an intriguing development in politics, and likely a worthy course of future investigation. This may include further refinement in what it means for the Internet to be a democratic space, or how the Internet is used (or not) to advance the cause of democracy around the world.

There are also important questions about the future of the Internet and its impact on the storied self. As Internet penetration rates increase and the sophistication of the

Internet's narrative technology increases, how will users experience the Internet? What will this mean for our sense of self and our lives in the "real world"? How will an increasingly common Internet influence the collective human experience? At the impasse of the self and the Internet is globalization. To what extent could the Internet reduce the relevancy of national boundaries or local culture? This should include a consideration of the linguistic effects of this platform. What will be the enduring effects of the Internet on language evolution? If the Internet has flattened the world, will it also flatten language?

The nature of the Internet as a knowledge network was a central part of this dissertation and will likely continue to be integral to Internet studies for years to come. Important (and interesting) questions arise as we consider the way human beings have related to information over the millennia. With the development of oral history and writing systems, movable type and the codex book, the Internet is positioned to be another important development in how human beings store, organize, and interact with their collective knowledge. Seeing the wide-spread effects of movable type, scholars should be properly motivated to continue to consider the effects of the Internet on a burgeoning "knowledge society" (Hargreaves, 2003). Exploring more specific questions about knowledge producers and consumers should be a first priority for those interested in pushing the field forward. In particular, an extended examination of the role of search engines is an advisable next step. Perhaps this could include studies that compare the produced results of search engines and what they mean for different stake holders (information producer, consumer, and organizer).

Lesson #5: Implications for Education

Most departments and programs of education teach about the Internet, often in teacher preparation courses devoted to technology, but also as a component integrated into other courses such as subject methods courses, and in more specialized courses and programs devoted exclusively to technology education. A common practice for colleges of education is to house their instructional technology programs in educational psychology departments. This has created a healthy emphasis on the value of technology for teaching and learning. Often, educators ask, "How can this technology assist me in making a learning experience meaningful?" For a period of time, particularly in K-12 schools, we educators (I include myself) were quite enamored with anything involving technology. The focus for practitioners and colleges of education was in leveraging technology "properly," an agenda that was pursued with vigor. Legislators and policy makers seeking progressive solutions for the "problems" of American education saw technology as a magic bullet and acted accordingly. From 1990-2000, United States' federal spending on educational technology was a staggering $37.8 billion dollars ("QED's technology purchasing forecast, 2000-2001", 2001). This figure does not include what state governments, intermediate and local school districts invested in technology through state monies and local millages.

The overwhelming optimism that surrounded technology created a predictable backlash against the uncritical use of technology in education. Contrarians like Larry Cuban (2002), Clifford Stoll (1999), and Todd Oppenheimer (1997) called for a moratorium on technology spending in schools. Stanley Katz (2001) warned against confusing a tool with a goal. With funding fading after the dot-com bubble burst and influential thinkers questioning the value of educational technology, the relationship

between technology and learning cooled. In the years that have followed, a more balanced approach has risen out of the valley of the dot-com era and run-away optimism toward technology. Now, educators who speak to the value of technology for education do so with cautious optimism and a critical eye. In their comprehensive volume on teaching and learning, Bransford (2000) and his colleagues capture the spirit of the current times with technology:

> The new technologies provide opportunities for creating learning environments that extend the possibilities of "old"—but still useful—technologies—books; blackboards; and linear, one-way communication media, such as radio and television shows—as well as offering new possibilities. Technologies do not guarantee effective learning, however. Inappropriate uses of technology can hinder learning— for example, if students spend most of their time picking fonts and colors for multimedia reports instead of planning, writing, and revising their ideas. And everyone knows how much time students can waste surfing the Internet. Yet many aspects of technology make it easier to create environments that fit the principles of learning discussed throughout this volume (p. 206).

These words emphasize the importance of assessing technology through its use, as a pragmatist would. For the pragmatist, to ask whether the Internet is a good educational tool is to misframe the question of technology in education: "There is no such thing as educational value in the abstract," wrote Dewey (1987, p. 46). Such thinking places the emphasis of technology's role in education on its realized effects, not the technology itself. In many schools, colleges, and universities, the guiding question for the Internet, and for instructional technology in general is Deweyian: In practice, what kind of experiences does the Internet create for its users? And the answer to this question certainly will differ across the range of students and situations where the Internet is used in education, as "it is no reflection upon the nutritive quality of beefsteak that it is not fed to infants" (p. 46).

By and large, educators no longer blindly following technology's tune, like a pied piper, and we also recognize the naiveté of the contrarians who pine for a past that only exists in their memories. Rather, those who speak to the practice of teaching and technology do so with Bransford and Dewey in mind. Do I like the technological effects that I see? Is this technology creating a kind of experience for my students that we value as a school, district, department, or institution? A strong focus on effects is what being "critical" of the use of technology in education has come to mean.

In many ways, it is helpful to consider the impact of a technology on the landscape of education. To do so is to recognize, as Thoreau did, how the train sometimes rides upon us, rather than we on it. This position – that technology can be good or bad depending on how it is implemented – has been useful to educators. Consequently, pragmatic criticality is deeply embedded in the thinking of many preservice and practicing teachers, administrators, and technology directors. However useful or accessible this line of thinking may be, this dissertation hopefully demonstrated to some degree the importance of being "critical" toward technology in other ways. In particular, I have tried to model how one may ask questions of technology, those that may transcend the anecdotes and examples contained in the use of the technology (though use is still very important). Three lessons emerge from such an interrogation of technology.

The Medium-Knowledge Connection

First, I have argued that while meaning may be created through use, some values are "frozen" in the code (Bowker & Leigh-Star, 1999). By this, I mean that technologies are not neutral in their use or their design. They often create certain outcomes and effects

through the nature of their design. For example, the design of the codex book coupled with the printing press (which allowed for standardization of text) contributed to a different relationship between humans and their information and knowledge. Through the qualities of standard print, information organization favored indices, page numbers, tables, and outlines – the tools of hierarchy and linearity. As I argued in Chapters 2 and 3, the Internet presents a different kind *constructural* relationship than did the codex book, one that emphasizes *bricolage* and nonlinear, associative thinking and working. So while one cannot say that the Internet is always good or bad for education (how you use it does matter), one can discuss how the Internet – or any technology for that matter – predisposes us for certain kinds of existences, relationships, and interactions. In this way, I hope to have created a comfortable roost between the essentialists, who argue that technology is defined through its inherent properties, and the pragmatists, who emphasize the effects of technology through use. The two positions describe two sides of the same coin, but in education, we have tended to describe the "use" side of the coin in great detail at the expense of the essential properties of a technology. There may be rich applications of Microsoft PowerPoint in education, but the technology's design may also be predisposed to reductive thinking, as Edward Tufte (2006b) argued.

The Importance of Power Relations

Second, because many believe that the Internet will occupy an ever increasing position of importance in education and society at large, understanding the nature of power relationships on the Internet is increasingly important. As I explained in detail in Chapter 4, power relations permeate the development, use, and disregard for technology. Through the activity of knowledge production on the Internet, we see that power relations

are impersonal, distributed, and act on actions, not individuals. With a distributed sense of power, the relationship between searcher, information, knowledge, and search engine becomes apparent. Searcher, information, and search engine work together through a circuit of exchange to create knowledge. Without the attention of the searcher, the search engine is irrelevant; without the search engine, unknown information is nearly impossible to find among the billions of web pages; without the exercise of power between the two, knowledge will not be produced. This circuit of exchange explains why the Internet is architecturally open and yet still mediated by popular search engine services such as Google. Again, the purpose of such a statement is not to paint a picture for students of monolithic power exercised by large media giants, but to acknowledge a relationship between search engine and user – one that defines what knowledge counts on the Internet. This relationship should be part of information literacy discussions in secondary and post-secondary institutions. If students learn to question the Internet and how its field of power relations impacts the organization of knowledge, then they are likely to be less naïve about the claim search engines like Google make to objective, non-political results. Such an understanding should make credibility problems on the open Internet more manageable.

Credibility in Online Spaces

Related to the power-knowledge discussion, is a possible third vertex of a new criticality: educators should take into consideration how users of the Internet evaluate the credibility of Internet sources, rather than discussing how students *should* come to such decisions. Chapter 6 explains through theoretical and empirical evidence that users of the Internet gather a Gestalt understanding of a web source's credibility rather than using a

step-wise approach. It would be ideal if young users of the Internet would regularly employ algorithms for evaluating websites which encompass every one of the Association of College Research Librarians' (ACRL) Information Literacy Competency Standards for Higher Education, which according to the ACRL are "pinpoint specific indicators that identify a student as information literate" (ACRL, 2000, p. 5). However appealing a standards-based approach to information literacy may be, the ill-structured nature of the Internet resists such formal organization of credibility standards. There appears to be incongruity between how users perform credibility analysis, and how the process is taught in classrooms, as evidenced in media literacy scholarship (Gardner, Benham, & Newell, 1999; Thoman & Jolls, 2004). The solution to this incongruity may be more instruction, standards, and tests, but given that users bring outsides skills to the process, we should not be surprised if they continue to make such decisions using quick value judgments (Gladwell, 2005). It may be better to encourage the use of these intuitive judgments about the veracity of sites, which include how the site looks and whether it feels credible, just as students make snap judgments in their lives each day. Through their extensive and deep experience of surfing the Internet, students develop a dense familiarity of the range of information available. As they surf for pleasure, they employ gut-and-guess strategies to evaluate the nature of information, entity, or person on the Internet as they shop, chat, social network, and learn. It would not be surprising if within such Gestalt snapshots, one did not find in varying degrees some of the standards currently taught for information literacy. However, we should not – as Katz warned earlier in this chapter – confuse the tool for the goal. The goal is not to master information literacy standards, but rather, to make good decisions about online resources.

Coaching students to hone their abilities and rely on their organic experiences with the Internet rather than the artificial ones they have in school is a course of action that respects the Internet as a complex set of practices.

Ideas for Changing How We Teach Technology

I do not pretend that these three vertices of criticality would come as a surprise to those who practice or research education. Nor do I believe they are in any way comprehensive; rather, I offer them as a starting point in a conversation – one that should lead us away from the popular but limited conceptualization of criticality ("technology is neutral; how I use it is what matters"). An expanded understanding of criticality, as featured in these three "vertices," should nudge students away this "common criticality," one which only defines meaning through use, to a criticality that asks questions of technology not dictated solely by its implementation. This is quite different than how many educational technology courses teach teachers to be critical of technology.

Many courses frame criticality toward technology as a two-step process: (1) learn how to use the tool (hardware or software) and (2) determine how to integrate it into your teaching and your students learning. Such an approach assumes the neutrality of technology, something with which many philosophers, sociologists, and historians of technology would be uncomfortable. Perhaps what should change are not specific examples of critical examination of technology – as I have provided here – but the process by which we discuss technology. Rather than a simple two-step process of reflection, teachers should be encouraged to expand how they think about technology. While learning how to operate software or hardware, teachers should be encouraged to

consider the broader implications of the technology. Such a process should consider five themes of a "new criticality."

First, what values are embedded in the design of this technology? By the nature of the design, purpose, and features of the technology, there are some "values" that come through the service through all of its use. They are implicit to the structure of the technology. Tufte's (2006b) observation that PowerPoint induces hierarchical and reductionistic organization of ideas is the best known example, but there are others. Assessment technologies like eInstruction's "clicker systems" (in which students use small, hand-held devices to transmit responses to teacher questions) do provide a highly interactive environment and the possibility of individualized, ongoing student assessment. However, by virtue of having software for assessment, the kinds of questions teachers can ask when using the system are influenced. The eInstruction system allows for questions with clear choices (true/false, multiple choice) rather than open ended questions.

Second, teachers should question what is forced out of the classroom experience and the curriculum by the inclusion of technology. Classrooms are finite experiential spaces – there is an upper limit to what a class can encompass. Addition may require subtraction. This is easy to see as teachers enthusiastic about technology assign students PowerPoint presentations as a replacement for the conventional paper. A more subtle example can be seen in Burbules and Callister's (2000) treatment of Internet use, in which they encourage critical hyperreaders to question, "what isn't on the Internet?" As the authors describe, "...one of the most important and yet difficult dimensions of critical use...[is that] for all its encyclopedic content, the most striking thing about the Internet is

still its silences" (p. 77). Burbules and Callister's insights may be old by Internet standards, but the critical insight is important. By choosing this technology, what I am not choosing? Such trade-offs are inherent, perhaps limiting, but inevitable in the practice of teaching. The purpose of such a question as this is not to encourage teachers to lament the trade-off, but to be aware of it and encourage informed, choices.

Third, a new criticality toward of educational technology requires that teachers not merely implement the technology with intentionality, but also reveal to their students, as developmentally appropriate, how they intend to change the classroom climate with the technology. Put another way, "educational technology" can be educational in many ways, including using technology as a tool for conversation about criticality. Often, those in media studies think of media literacy as a separate curriculum; however, dialogue about the less visible attributes of classroom technology may be important to prepare students for a technology-rich world (if one is optimistic) or the burgeoning "media torrent" (if one is skeptical of the claims of media and technology, like Gitlin (2002)). Conversations about classroom technologies can be extended to consider a wide array of technological choices students make each day. Who better to model critical engagement than their teacher? This can be realized, by example, as teachers supervise their students' use of digital information in classroom research. Such is an opportunity to discuss the benefits and limitations of the Internet, the role of the search engine, and the distributed nature of power.

Fourth, while this it is important to recognize the non-neutrality of technology, its use is still an important factor. How we use technology does matter. Technology is not neutral, but neither is it determining (Feenberg, 1995). Though Tufte properly

understandings the hierarchical, reductionistic uses of PowerPoint, artist and musician David Byrne shows how PowerPoint can be used to create art. He reflects on his journey with the application:

> Although I began by making fun of the medium, I soon realized I could actually create things that were beautiful. I could bend the program to my own whim and use it as an artistic agent. The pieces became like short films: Some were sweet, some were scary, and some were *mysterioso* (Byrne, 2003).

Bending the program around one's own whim is a way of describing the agency of using technology. This principle is seen in most stages of human life: a child uses a yard-stick as a play sword, a teenager checks the condition of her hair in a window, and an adult props a door open with a tub of laundry detergent. Design does not dictate use; it only influences it.

Fifth, a new criticality requires a historical understanding of not only technology in the classroom, but also the evolution of the goals, purposes, and practices of education. Educational technologists often work in the present. They spend hours learning the latest developments in a wide range of hardware and software solutions. They are rewarded for a rich understanding of the current possibilities in educational technology, as well as their ability to forecast its future direction. Criticality requires that we not only understand the impact and value of present practices in technology, but also past practices. The study of the history of education's purposes and practices (as well as the social and economic context of those conditions) will give teachers and educational technologists a better appreciation and awareness of the relationship among technology, society, and education. Rather than thinking technology only in its present forms (which narrows our imagination), historical perspectives on technology will provide a "long view" of the recurring themes, questions, opportunities, and constraints across time. Chapters 2 and 3

of this dissertation can be seen as such an effort – situating a current technology (the Internet) in the long history of representational media.

These themes are presented as opportunities, not constraints. Because the Internet is new, Internet studies may be able to examine technology with fresh perspectives. The rules of the Internet have yet to be fully written, even after more than ten years with the World Wide Web. With enormous change comes incredible opportunity to critically reflect on what technology is, what it does, and how it constrains and creates.

The End of the Internet/ The End of a Dissertation

If you search for the "end of the Internet," you will find an unusual collection of pages that claim to represent the final page of the Internet. On such effort reads:

> The End of the Internet
> Congratulations! This is the last page.
> Thank you for visiting the End of the Internet. There are no more links.
> You must now turn off your computer and go do something productive.
> Go read a book, for pete's sake.
> (from www.shibumi.org/EotI)

In a decentralized, nonlinear environment that offers no beginning, middle, or end, the "last page" of the Internet is a contradiction in terms. Yet, the end of a dissertation can be equally difficult to locate. It would seem that one could go on indefinitely, adding layer upon layer of exploration and experimentation to the existing analysis found in this dissertation; yet, all stories must come to an end. A young fan of C.S. Lewis' *The Chronicles of Narnia* wrote the acclaimed author a letter asking if Lewis planned on extending the series past the seventh and final book. C.S. Lewis wrote back, "...once a story stops telling itself to me inside my head, like a tap turned off, I can't go on. And if I tried to, it would only sound forced." I cannot say that the story of the

Internet has stopped telling itself to me, but as some point, one story must end so another can begin. So it is with this one.

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