From Print Culture to Digital Culture: Effects on Communication, Culture, and Technology

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In 1440, Johannes Gutenberg introduced the World to a new technology that would change the fabric of communication, of human epistemology, and of so much more: the first moveable metal type. The printing press eliminated and reduced numerous barriers to entry for literacy and truly instituted the shift from an oral culture to a print culture. The invention of the printing press did not just make it easier for people to communicate via writing, it sparked an entire social and cultural change in the way people live and communicate. Pelias and Shaffer tell us, in *Performance Studies: The Interpretation of Aesthetic Texts,* that in "oral cultures, people learn by apprenticeship, by listening and doing. In print culture, people learn by reading, studying, and reflecting [. . . .] print develops new sensibilities, new ways of perceiving" (29). In order to develop new sensibilities and ways of perceiving, a major transformation of the human psyche must take place; and the effects were not subtle. The transformation from oral to print culture, then, is a defining moment in the history of the world because of the profound nature of change it had on society.

I believe that we are undergoing a transition in language that is similar in impact, if not more so, than the transition from oral to print. Communication as we know it today, is no longer experienced primarily through text, instead it is experienced through digital technology. The invention and widespread use of the Internet, wireless networks, and mobile devices has created the ability to stay connected to electronic media, technology, and people at all times. Thus, we are currently experiencing a move from a print culture to a digital culture. This digital culture is characterized by, but not limited to, hyperconnectivity, instant gratification, decentralized collaboration, and exponentially growing amounts of information. These characteristics have serious implications for the fabric of our society, and for how individuals view themselves.

Hence, it is vital to everyone to understand the current and possible future effects of digital culture.

The research and studies on digital culture are limited, and what we have is mostly from technical backgrounds, such as computer engineering, the consumer technology industry, and information and communication technology scholars. What other little data and research articles we have are limited to individual mediums, and any Meta notions of the effects from this change on society and culture as a whole are mostly speculation. Studying the shift from oral to print culture has always fascinated me. Not only were the effects extremely profound, but the change effected everyone in the world, even those that never learned how to read. Also, the effects were felt throughout the fabric of our society and culture, because a revolution this intense changed nearly every aspect of our lives. In conjunction with this fascination I have also always had a love for technology. When I was in the sixth grade I built my own computer, by high school I had three of my own websites, and now I fill my free time by reading about new technologies and digital services. I noticed that most of these technology articles focus on how the new technology will make some activity easier, cheaper, quicker, or all of the above. However, I found myself taking most of these articles one-step, or many steps, further. I began wondering how these new technologies would effect how we communicate, how we learn, and most importantly how people will interact with each other. As I began this somewhat unconscious process, I began to notice that these technologies, as a whole, have the power to create changes of similar, if not greater impact than the transition into a print culture. With this in mind I have compiled individual articles on technologies, along with research on hyperconnectivity and instant gratification to predict what major social, cultural, and communicative changes will occur from this transfer from print culture to digital culture.

The United Kingdom's Government Office for Science published a report in 2013 that aimed to come to a "broad and independent scientific view of changing identities in the UK through a synthesis of existing evidence form a range of academic disciplines, including computer science, criminology, the social sciences, and the humanities" (Government Office 4). In order to complete the report, the UK government also commissioned scholars from varying disciplines to publish twenty new articles to fill in areas of missing literature. These supporting articles provide a substantial amount of data for the report and without them this synthesis may not have been possible. The report was created as an aid to policy makers in navigating the recent, current, and future effects of digital culture on "identity" in the United Kingdom. It is also the closest published work we have to describing the effects of the transition to digital culture from print culture. I would not have been able to compile a report nearly as detailed as this one without these articles, and I hope that my own synthesis can act as a starting point for someone else as well.

The shift from a culture of orality to a culture of print and text altered the fabric of our society forever. The effects of this transition changed the ways in which humans communicate, obtain and retain knowledge, and more. These effects have been analyzed and dissected extensively, and this literature will be key to creating a framework for understanding what changes are already occurring within the switch from print to digital, and what possible shifts our society may undergo in the near future as technology continues to develop. Because the current literature on digital culture is scarce, we must look to an era of comparable impact for research that can be projected onto similarities in digital culture. At the heart of academic studies within this area is research by Walter J. Ong. His book, *Orality and Literacy,* has been translated into twelve different languages and is used extensively. The most important aspect of Ong's work is

its interdisciplinary characteristics. Not only will my work borrow from Ong's concepts on oral to print culture, but, I believe, it will also be useful for people other than simply communication scholars. The effects and implications of this work are useful for a wide range of scholarly disciplines, policy-making decisions, and nearly limitless commercial industries.

Understanding the history and origins of writing, such as its roots in Sumerian clay tokens, paints early writing systems as forms of digitization themselves. This can be used to better understand the similarities and differences between print and digital culture as the information systems that characterize writing can be seen as forms of digitization, and printing techniques as old as the 1500s created an important bridge between the printing press and the computer (Ong, *Digitization* 12). In studies about the characteristics of print culture it has been said that writing, in certain ways, brought language and knowledge to a climax for humans (Ong 266). However, by comparing the characteristics of print culture that create this "climax" in language and knowledge with the characteristics of the new digital culture, we can see that there is still much room for growth and improvement in both language and knowledge for humans with the assistance of technology. This has great importance, because it means that capacity for language and knowledge may only be limited by the technology that we yield, so there may still be more room for improvement. It cannot be said for sure because in the 1500s no one could have comprehended the digital culture we live in today, but it certainly is possible that we could witness another type of cultural revolution dealing with communication and language. If this were to happen, it would most likely occur much quicker than the change from print to digital because of the rapid pace of digital culture.

At the heart of digital culture is the interaction of humans with electronic devices that offer a wide array of platforms for communication, and thus interaction with other humans via

their electronic devices. Communication technology plays a much larger role in human interaction than it used to during print culture. Today's communication technology is not only much more efficient and powerful, but it is also interactive with the user and other machines. Thus, technology today is not only interactive with the user, but also with other communication technology devices. To truly grasp constantly shifting fabric of digital culture we need to understand the history and characteristics of the Internet, the electronic devices that construct the network, and the developing platforms that characterize these electronic devices. The history of the Internet is complex and involves many aspects – technological, organizational, and communicational, and these tools are used for electronic commerce, information acquisition, and communication (Leiner et al. 102).

The key to the rapid growth of technology and services within the Internet is due to free and open sourcing of almost all basic documents needed. The Internet community has grown from, and continues to promote, a "hacker ethic". The "hacker ethic" is characterized by information sharing, decentralized collaboration, distrust of authority, and programming as an art form, but all of this is being threatened by the ever looming dark shadow of the commercialization of the Internet, as the powers in electronic commerce are being fully realized by major corporations and mom and pop shops alike. Leiner et al. tell us, in *The Past and Future History of the Internet*, that the Internet is a tool for worldwide broadcast capabilities, information dissemination, and a medium for collaboration and interaction, without regard for geographic location (102). On top of e-commerce, the power for worldwide broadcasting capabilities is extremely important, especially with the recent success of social media and text messaging in social and cultural movements and protests.

While digital culture has many similarities with print culture, it also has important differences. The most important difference is hyperconnectivity, which can be described as "the use of multiple communication systems and devices to remain constantly connected to social networks and streams of information" (Government Office 22). It is characterized by being readily accessible, information-rich beyond any individual's capacity, and interactive between people and machines. While accessibility and information-richness are also common to the print culture, they are not common to the extent that they are in a digital culture because of the efficiency and aspect of always being connected. Hyperconnectivity is thus being praised in the business world for increasing productivity, is coveted in the consumer world for its convenience, and is exploited in the social media world for driving revenue. But it is also raising certain unknown questions. Are people finding it harder to disconnect themselves? Are our public and private identities becoming blurred together? What effect will hyperconnectivity have on our ability to remove ourselves from the present? These are a few of the issues that I will address regarding hyperconnectivity and its effects on our communication, culture, and knowledge.

Whereas in the transference from oral culture to print culture we saw the importance of memory dwindle, I believe that during the transference from print culture to digital culture we will not only see the importance of memory dwindle even more, but we will also see the importance and/or capacity of delay-processing dwindle. While the concept of instantaneous gratification has been available for decades and used across multiple disciplines, it is my belief that instantaneous gratification will be looked at in new ways as both a hindering product of hyper-connectivity and also a driving force of productivity and new technology. A *Boston Globe* article titled "The Growing Culture of Impatience Makes Us Crave More and More Instant Gratification," by Christopher Muther, lists the negative effects of hyper-connectivity as "a need

for instant gratification and loss of patience". We are beginning to notice that hyperconnectivity is inoculating us against delayed gratification. The positive to this is that the demand for more instant gratification is driving technological improvements that are eliminating large amounts of inefficiency. However, our love for instant gratification also comes with its downfalls. The effects and implications of an increased need for instant gratification can raise a great amount of questions as well. What effects will increased instant gratification have on our capacity for patience, and what limitations does this create on our communication, culture, and health? What positive implications can come from increased instant gratification? What implications can an increase in instant gratification create for consumerism and marketing? These questions will be used to create a broad picture of what effects and implications an increase in instant gratification will have on our society.

This analysis, while it covers a broad topic of concepts and ideologies, is central to the communication discipline. In *On Defining the Communication Discipline*, David Zarefsky tells us "the central concern of the communication discipline is the study of how messages effect people" (110). With a change from print culture to digital culture we are beginning to see an entirely new way to communicate our messages with new media and technology, and these new ways of delivering messages have new rules and norms that effect how messages are delivered and received. These differences are central to understanding what effects this cultural shift will have on societies all across the world. With the invention of the printing press the world did not dramatically change over night. However, over the more than 600 years later, the effects are profound. As with the invention of the printing press, the invention of the Internet did not dramatically change our world overnight; but, as we move farther and farther away from the initial inventions the changes become more profound, and with this analysis I highlight these

changes and help predict what these changes will mean for society as a whole in the near future. This synthesis should by no means be considered a complete doctrine. It is only meant to be a broad overview and analysis of the effects and implications current our transition to a digital age will possibly present to us. Its use should be wide spread as it can be used as groundwork in predicting future human communication, culture, and ways of knowledge. This synthesis offers a starting point for professionals in a plethora of fields, including: government policy, marketing plans, communication technology, social media companies, and many more.

From Oral Culture to Print Culture

To fully understand the implications of our transition from a print culture to a digital culture we must first have background on the last major shift of its kind, oral culture to print culture. According to W. E. Biernatzki, "writing appeared only when proto-civilizations had developed to the stage where they needed it," and whether that be for record keeping, continuity of religious practices, or for governing empires (29). Biernatzki uses the word "appeared" because according to many scholars writing is not an "invention," in the sense that it was not "a conscious search for the solution to a clearly conceived problem" (DeFrancis 215). The first system of "full writing" was gradually stumbled upon by people working over generations to improve and perfect simple visual codes. This was the only route to the creation of writing because it could not be "effectively projected in the imagination until after it had been realized" (Ong, *Digitization* 5). Digital culture is similar to print, in this sense, since electronically sending information could not effectively be projected into our imagination until after it had been realized, and it was realized through small developments in technology that slowly built into a massive electronic network. Where the two differ is the rate at which the creation was stumbled

upon; with writing and print technologies already in place, the rate at which the Internet developed was much more rapid than the development of a "full writing" system.

Print culture and digital culture share another development characteristic as well. Before the development of either cultural transition there was an urgent need that spawned the transition, and in both cases humans have been resourceful in inventing new modes of communication in a relatively brief time (Biernatzki 29). Writing systems were developed out of necessity, because when urban centers expanded and diversified something more than just oral communication was needed to keep social and economic order (Biernatzki 30). The same is true today; the rapid rate of our population growth and urban expansion has created a great demand for more advanced communication methods, ones with which technologies in print could not keep up. In order to account for this technological gap, the computer, Internet, and peripheral devices were created, and we can only assume that more advancement will continue to come as population growth continues to push demand for communication capacity and speed.

The first "full writing" system ever created was Sumerian cuneiform writing, and it is a product of an eclectic grouping of early information systems. The origins of writing began with the pictograph – a visual illustration used to stand for a visual object. After the pictograph came the rebus – a drawing that is used to call forth the sound of the word, such as drawing a bee to call forth the sound "be". The pictographic systems were numerous across the world, but few developed into the rebus stage (Ong 6). However, they both lacked the abstract thought and expressive ability that would be needed for a "full writing" system. Denise Schmandt-Besserat's *Before Writing* has produced extensively documented work on Sumerian, three-dimensional tokens, which preceded the pictographic. While the pictograph and rebus produce the general origins of writing, the specific origins of Sumerian cuneiform writing lay within three-

dimensional tokens that helped create the abstract thinking processes necessary for a complete writing system. The tokens date back to as far as 8,000 BC, were used for accounting purposes, and originally were not pictographic or iconographic. As the tokens evolved, so did the complexity of their organization and abstract meaning. During the beginning of the redistributive economy that marks urban life, the tokens took on more complexity as a concrete numbering system was attached to them – meaning that one token could now represent three sheep. From this base of a counting system, the cardinal number system was finally created, which we still use today. The system is a complete human construction and thus constitutes a form of abstract thought, the exact type of abstract thinking ability that is necessary to pair with pictographic systems to create a "full writing" system (Ong 8-10).

It wasn't until the invention of a new technology, the stylus – a wedge shaped utensil used to transcribe shapes onto clay tablets, that the characteristics of pictographic systems were paired with the abstract abilities of cardinal numbers to create cuneiform writing (Ong 12). Even in the BC era, the evolution of human communication, then, was dependent upon technology, and while a reed stylus may seem crude compared to a smart phone, in a way they share a lot of similarities in terms of importance in boosting our communicative capacity. The use of technology by humans, in conjunction with, communication has only become more prevalent and interactive with time, and in the future humans may face problems with the relationship between technology and humans. As the importance of technology to our everyday life continues to expand, so does our dependence and use, and this will certainly have an effect on how we view our identity with technology.

After Sumerian cuneiform writing came arguably the most important addition to the development of writing, the Semitic proto-alphabet. All forms of current alphabets trace back to

the Semitic form, and, as DeFrancis says, "no other writing system has been accommodated to so many different languages and cultures as has the alphabet" (215). The alphabet is also unique for a writing system because it is both "orality-friendly" and "computer-friendly". The characters in the alphabet individually hold no meaning, it is not until they are put together into a sequence and said aloud that they contain meaning. The printing press and computer take advantage of the alphabet by pairing it with the cardinal number system and various other symbols to create an alphanumeric system. Each unit in the alphanumeric system is moveable and discrete and that works to the advantage of digital systems. A printing press, in this case, is considered a digitized technology because, as Ong defines it, digitization is, "processing data in terms of numerically distinct units" (4). Digitization, then, is not the same as digital culture because it is simply referring to a type of information system that is characterized by "numerically distinct units," and digital culture is referring to an era of communication that is dominated by use of digital technology in our communication and daily lives. As we can see, a printing press as a digitized technology means it shares characteristics with a computer. In reality, the computer and the Internet are simply technological evolutions of the printing press, ones that are capable of exploiting alphanumeric systems for exponentially more possibilities.

It is clear that writing systems and the printing press have increased our ability for communication and knowledge, but it is also important to understand how this increased ability effects the individual. Numerous papers and research projects have been published on this topic, but it is Walter J. Ong, again, who leads the documentation and analysis in this area. One of the most important aspects of the creation of writing is that there is a "movement of verbalization from its initial oral field of speech into the visual field of writing" (Ong, *Digitization* 18). The movement from an oral field to a visual field is one of the primary characteristics of print culture

that creates much of its change. By moving into a visual field, language and communication takes a new form, and because of this it helps expand human communication beyond the previous capabilities. The most important new expansion from moving into the visual field is the ability to distance the knower from the known.

Havelock points out, in *Preface to Plato*, that one of the primary advantages of the visual aspect of writing is the distancing of the knower from the known. When language is put into writing, the object of knowledge becomes "out there," in the text; whereas in an oral culture the object of knowledge lies within the rhetor at all times. This abstract ability of thought is made possible dating back to the original Sumerian use of cardinal numbers, and with this the ability to view and analyze an object as separate from self was born. The greatest effect from this is that the reader gains a level of analyzability and intellectual dissection that was never possible for an audience member in an oral culture (Ong, *Digitization* 17)

The development of writing, its uses by humans, and the relationship of writing to language have changed over time, but if you were to examine one era, the European Middle Ages is the best era to study. The interaction of the oral and literary cultures creates a clash between the two, illustrating the effects of introducing the visual field to language (Ong, *Orality* 5). During this era the literate were mostly wealthy and educated, but a rise in literacy rates across cultures over time began to transform the relationship of writing to language. Medieval text was one of the closest writing forms to orality, as we have seen. At the time, most of the written texts were records and transcriptions of speeches and oral stories; even the primary writing genre was based on oral storytelling genres. The characteristics of literature at the time were flooded with orality, in other words; and because only the educated could read or write, academics provide a great example of the clash (Ong, *Orality* 7). At the time the center of

education was rhetoric, which was focused with preparing the rhetor, and most exams were not written, but were instead oral. The principal reason anyone learned to read and write was not for themselves, but to be able to become a better public speaker or rhetor (Ong, *Orality* 3).

The use of Latin in academics, a language that ceased being a vernacular centuries before the middle ages, assisted written language by expanding its uses (Ong, *Orality* 6). No on had spoken Latin as a mother tongue since approximately 600 AD, so everyone who knew Latin had learned it through writing. Because of this, Latin is a fully textualized language, meaning that Latin, at the time, had a very direct relationship to writing that other languages did not. The cultures that had produced a writing system for their language had a literary language, but they were not nearly as dependent upon the text as Latin (6). This "high" language further aided in establishing distance between the knower and the known, as the language is free of the emotional and unconscious contingencies that language carries when learned orally from birth. A language that is learned solely by text has different capabilities and advantages than a language learned since birth, orally. One such advantage is for science and philosophy, as it helped increase the objectivity of a researcher. Because the language is not learned

Towards the end of the Middle Ages Gutenberg invented the first moveable type printing press and a communication revolution took place. The ability to disseminate printed works in duplicate form, and in bulk, spread literacy across the world and separated text even more from orality. Though text will never be completely without orality, the printing press marks the moment when orality becomes the main benefactor of text, not the other way around (Ong, *Digitization* 12). The printing press also helped remove a major barrier to knowledge. As it disseminated texts to the masses and increased the literacy rate, no longer could the wealthy exclude everyone else from the ability to read and write. The printing revolution, then, enhanced

the ability to spread knowledge, to preserve ideas, and to generate new thoughts. It was printing that enabled the explosion in knowledge that led to the Renaissance, the scientific revolution and, eventually, to the knowledge-based economy that we enjoy today (Rash). Before the printing press was invented, the relationship between literacy and orality was already undergoing transformation. After invention, this transformation moves from the hands of the elite to those of the masses, and thus proceeds at a much more rapid pace. The reduction of barriers to entry for literacy and mass communication created an inundation of information, the likes of which humans had never seen, and which continues to grow at an exponential pace today (Ong, *Information* 11). With the invention of writing humans were able to record knowledge onto an object, thus knowledge was able to exceed beyond what a single mind could master. From this expansion in knowledge capacity, humans were faced, for the first time, with the problem of organizing, searching for, and validating the continuous flow of information, but the printing press turned this flow into a waterfall.

The development of writing was very long and arduous process that took centuries to complete, but with the addition of technology the process never truly is complete. As humans began to add technology to writing, such the reed stylus and the printing press, the strengths and weaknesses of writing shifted with each new invention. Also, the more advanced writing became the more its influence from orality was left behind. As this shift occurred, our primary form of language and communication shifted from an oral field to a visual field. This change allowed for many new capabilities, but the ability to separate the knower from the known, or be able to analyze an object as an entity separate from the individual analyzing. We also saw the use of languages that were learned only through writing, such as Latin. This textualized language, as it became, gives insight into the differences of text and oral languages, as Latin helped increase

objectivity in scientific writing. While it may be difficult to imagine that a time so long ago and so different from today could have such similarities to the culture we are experiencing now. But, the change to digital culture has had such profound effects on our daily lives, and will continue to. Thus, we must examine the current and possible future implications of a digital culture; there could be further room for expansion in language and knowledge for humans, or the relationship between humans and our technology could become overwhelming. The possibilities are nearly endless, but my synthesis will help sift through and focus on the most important and urgent issues.

Digital Culture

It is important to remember that we are only now experiencing what can be referred to as digital culture; and that, because of this, definitions and characteristics of the culture must be seen as fluid and not concrete. There have only been a few consistent characteristics over its short and disruptive timespan, and one of them is its constant and rapid evolution. The Internet has a similar relationship to digital culture as the printing press has to print culture. Both technologies carry enormous weight within their respective cultures, and both are responsible for turning a transitional period into a cultural revolution. However, the speed at which our World is changing can be debilitating at times. To put it in perspective, it took over 1500 years from the creation of the Semitic proto-alphabet to the printing press, 500 years from the printing press to the Internet, but it only took 10 years from the World Wide Web to the smartphone.

<u>History of the Internet and World Wide Web</u>

Just as the printing press was the catalyst for print culture, the Internet is the catalyst for digital culture, and, as mentioned above, the Internet and computer can even be seen as a

technological evolution of the printing press. The needs for this technological evolution were generated by advancements in transportation, which in turn created a demand for better communication and information systems. With the invention of the Internet and other supporting technologies (computer, smartphone, World Wide Web, etc) the amount of information systems we can save, categorize, and access instantly is theoretically limitless (Ong, *Information* 10). The rapid pace of advancement in digital technology and nearly limitless access to information is making it no longer just a technology but an interactive technology that has a much greater role in our lives and communication than print ever did. A brief history of the Internet and supporting technologies is necessary, then, because much of current Internet culture is characterized by its invention and development.

The history of the Internet is complex and receives influence from "early research in packet switching, the government, the military, industry, academia" (Leiner et al. 102). The first building blocks for the Internet were introduced in July 1961 when Leonard Kleinrock of MIT published the very first paper on packet switching theory. His theory led to communications using packets instead of circuits, however this would not be realized until 1966. In 1965, Lawrence G. Roberts, also of MIT, was able to connect a computer in New York to a computer in California through a dial-up telephone line. To Roberts' dismay, he realized that the circuitry of the telephone system was completely inadequate for the job; but in 1967, with Department of Defense funding, he published a paper for a computer network that would use packet switching, and it was called the Advanced Research Projects Agency Network, or ARPANET. In 1972, just three years before the release of the "personal computer," the first public demonstration of ARPANET took place. However, ARPANET was not being widely used in the defense industry or operational organizations until around 1983, and by 1985 the Internet "was established as a

technology supporting a broad community of researchers and developers," and it was also beginning to be used for daily computer communications, such as early forms of email (Leiner et al. 104-105). ARPANET's contributions to the current World Wide Web goes beyond infrastructure to include culture and norms.

From the beginning, ARPANET "promoted the academic tradition of open publication of ideas and results" and "worked as a close-knit community" (Leiner et al. 106). The decision to grant open and free access to basic documents and protocols was key to the rapid growth of the Internet as it allowed for collaboration from all disciplines and limited barriers to entry for contribution. It is also still central to Internet culture and digital culture. Davies and Razlogova have noted that the tension over government and corporate control of the digital world has given rise to a "free culture" movement that strives to foster collaboration and share information. They add that this movement consists of people following a "hacker ethic": an evolving, and sometimes contradictory, set of principles that include "information sharing, decentralized collaborative governance, distrust of authority, and understanding programming as an art form" (7). It is evident, then, that ARPANET's contributions begin at infrastructure (both hardware and software), but then bleed into Internet and Web as well. In other words, it bleeds into ideas and values, the fabric of the culture. These Internet culture characteristics become even more important as our Internet identities and cultures begin to influence and blend with our identities and cultures in reality.

While the government funded most of the early research on the construction of networks, the legwork of assembling a widespread infrastructure that worked at national, regional, and local levels was at first taken on by the academic community. The National Science Foundation Network, or NSFNET, created a wide-area network infrastructure with the intent of serving the

entire higher education community and to be independent of direct federal funding. Over a nine year period, $200 million in funding was invested into the NSFNET infrastructure, and the Internet grew to more than 50,000 networks worldwide. In 1991 the first people joined a community on a new Internet network called the World Wide Web. By 1995, the end of NSFNET's nine year investment, the majority of the people on the Internet were using the Web and did not view themselves as primarily researchers or developers. Thus, the World Wide Web Consortium, a new coordination organization, was created to implement strategies to ensure that the Web would become a global standard (Leiner 107). As of 2012, there were over 2.4 billion web users (Internet World Stats). That means that, in just over a fifty-year period, the Internet went from conceptualization to a network used by over two billion people. This rate of growth and inclusivity has never been seen before from a communication technology, and will surely have long-reaching impacts.

"The Internet is at once a worldwide broadcasting capability, a mechanism for information dissemination, and a medium for collaboration and interaction between individuals and their computers without regard for geographic location" (Leiner et al. 102). Many of these characteristics can also be applied to print media by substituting the computer with delivery and transportation services, but the Internet is instantaneous and its capacity for collaboration and interaction is far superior to that of print, and it is still expanding. Wherein the printing press broke down the barriers of entry to literacy for the masses, the Internet has broken down the barriers of entry to mass communication and collaboration for the masses.

Hyperconnectivity

The Internet by itself would be useless, because it is only a network; but because the Internet is a network, its applications are far-reaching (Biggs 48). To take advantage of its vast information database and to interact with others, a person must connect using an electronic device. The amount of networked devices is astounding: by 2011 humans, were already the minority of Internet users, as the number of network devices overtook the human population, and Intel has projected that we will reach 15 billion devices by 2015, and 40 billion by 2020 (Biggs 47). Hyperconnectivity is the use of multiple communication systems and devices to stay constantly connected to social networks and information systems, and attributes include, but are not limited to: always being connected, easily accessible, information rich, interactive, and virtually unlimited storage capacity (Fredette, et al. 115). With hyperconnectivity we have experienced an immediate increase in productivity in nearly all aspects of society, both private and public. But, hyperconnectivity is also still very new and the future is still very unclear. This is why we must pay special attention to hyperconnectivity as a phenomenon.

The future of hyperconnectivity is difficult to predict because of the volatile and rapid nature of digital culture; but by analyzing its current characteristics and reviewing some future technologies that could assist hyperconnectivity, we can identify a few key areas of change. With the addition of social networks to hyperconnectivity a virtual environment has been created that can be seen as just as important as our real environment (Biggs 50). In theory, with hyperconnectivity, humans can be connected to their virtual environment just as much as, if not more than, their real environment. This has significantly affected people's identities, and will continue to be a driving force for change.

Identity can be defined as the way in which individuals perceive themselves and their place in the world, and how others categorize them. Identity is a key concept in a range of

academic disciplines, and because of this there are many variations in its definition. Nonetheless, they have all shown that identity is socially constructed and highly complex (Government Office 9). Furthermore, an individual has multiple identities, which can overlap and change over time or with different circumstances. Because we have identities in both the real world and virtual world of digital culture, it is clear that hyperconnectivity has a strong affect on identities. Identities are integral to our mental health and wellbeing because they are fundamental to determining how we understand our place in the world, and how we relate to others. Being able to maintain and express identities freely is important for our well-being and social integration. Identities also influence our behavior, but are not necessarily predictive of it because there are too many potential variables per situation (Government Office 9).

For example, a student would be expected to travel to school in the morning, but because we have multiple identities, anyone at a particular time could disrupt another identity. To continue with the example, the same student may not travel to school and instead go to a job interview because he is also an unemployed individual seeking employment. Identities, in other words, can be a resource for social change via social relationships, shared aspirations, and ideologies.

With hyperconnectivity, unrelated groups can be more easily mobilized when interests temporarily coincide. A perfect example of this can be seen with the "Occupy Wall Street" movement. An assortment of groups and identities converged together, largely with the aid of social networks, the Internet, and smartphones, over a shared interest in economic disparity. Lastly, identities are not only highly valued by individuals as a principal part of themselves, but also have psychological, social, and commercial value. The commercial value of identities is a highly active topic as the private sector is eager to exploit online identities for targeted

marketing, but privacy concerns are coming to the fore as consumers are slowly learning just how much access these private companies have to our information. (Government Office 11). The two driving factors behind the commercial value of identities are social media and big data.

Social media differs from traditional communication technologies because, by being online, it "allows users to create, share, and collaborate on content in new ways" (Government Office 27). As of September of 2013, 73% of all Internet users use a social networking site, and 90% of Internet users age 18-29 use a social networking site ("Social Networking"). The amount of personal information that is on the Internet and social media is astronomical because all of these people are active participants, creating, sharing, and collaborating on content. To compound the problem, there are different rules for digital media and information than print because technically you are "sharing" this information. This means that, in some situations, the photos, videos, and comments you share on social networking sites may be retained by the website. Thus, as users of social media we must be attentive and cognizant of any personal information we share online, with the awareness that it may be retained and used by others. The policies and laws surrounding online content and ownership have been slow to develop, but with more advancements in "big data," policy makers will soon be forced to write new legislation regarding personal ownership and property rights online.

"Big data" is a broad term that covers any data set that has become so large that it can no longer be processed using normal data management techniques (CyberSightings 699). As discussed before, the Internet has created an overwhelming amount of information and data. Estimates from Biggs and other information communication technology researchers suggest that more data was created between 2008 and 2011 than in all history before 2008, and that the size of the digital data universe now doubles every two years (Government Office 35). New

technologies and mathematical models are being created to help mine, organize, and analyze this overload of data and information.

Hyperconnectivity, of course, plays an imperative role in big data pertaining to individual habits, preferences, and motives. The use of social media on both mobile phones and computers allows companies to mine information about nearly every aspect of our daily lives. GPS services on our mobile phones help us with directions and finding local businesses or people with similar interests near by, but they also allow companies to store the location of places that you frequent. The sharing and collaboration functions of social networking sites allow individuals to easily communicate and share with friends and family from anywhere, but all of the content that is being shared is also being mined by the websites. This can include: photos, videos, personal interests, biological information, and geographical information. Finally, every website you visit or search term you enter saves a little piece of data to your web browser, and this browser history data is available to all other websites that you visit.

It is extremely apparent that all of this big data, properly mined and organized, can produce near mirror images of our identities. From a business perspective, this is the ultimate goal. This level of information allows companies to better understand consumer preferences and offer unrivaled levels of personalized products, services, and marketing (Government Office 18). It would also be of great importance to governments as well to provide improved public services. The demand for consumer big data from the private sector has been so great that big data sets have now become a commodity, and thus can be traded, sometimes without the consent or knowledge of the individual. The looming power and uncertainty of big data will very likely be the driving force of change in policy, regarding online content and ownership.

A large portion of personal information and data pertaining to personal identities are things that would not have been normal to make public during the print culture era, so we are witnessing a change in attitude toward privacy; whether the change is consciously made or not is up for debate, but the fact is that people are certainly sharing more personal information on public domains than ever before. This increase in sharing of personal information is creating a convergence between previously private and public identities, and hyperconnectivity is creating a convergence between online identities and offline identities, and social identities and work identities. The interweaving and convergence of identities is sure to have an effect on how individuals view themselves. Miller speculates that "this breakdown in the barrier between separate identities could be among the most important and transformative consequences of social and technological changes" (Miller). Just what those consequences and important changes will be are too difficult to speculate because we have not experienced a change to the structure of identities as great as this since we became cognizant of the concept of identity itself. People may find it harder to disconnect themselves, or to maintain distinct identities in certain situations, but only time will tell.

While hyperconnectivity and social media makes it easier for companies to mine data on individuals and their preferences, the same duo makes it easier for these exploited individuals to band together and push for social or political change. The hyperconnected nature of communication technology, paired with the decentralized collaboration and distrust of authority characteristics of online culture, make facilitating political and social movements much easier (Government Office 28). Evidence of this can be seen by the recent mobilization of dissent in Egypt. Before digital culture, a movement to the extent of the one in Egypt would have been very hard to fathom. While support on a similar level could have been formed during print

culture, the speed and precision with which this unorganized mass mobilize could never have been obtained just ten years ago. As of today, the public has the ability to mobilize around a shared interest, and start a movement that has the capacity for serious social or political change.

Instant Gratification

Overall, everything in digital culture is much faster than it used to be; technological advancements in supply chain delivery, transportation, communication, consumer electronics, and more have reduced wait times for almost everything in our daily lives. The positives from this increased efficiency are immense, so much so that we may have trouble imagining how we ever got by without all of these new technological advancements. However, our digital culture and hyperconnected lives may have some negative implications as well. As improvements in technology continue to limit or eliminate wait times, we see another effect on the individual in relation to patience. Now that we can have instant access to a majority of life needs (or at least what we perceive, or socially construct, as needs) through hyperconnectivity, our conditioning for "delay discounting" is dwindling. Delay discounting "pertains to the willingness to postpone receiving an immediate reward in order to gain additional benefits in the future" (Cheng, Shein, & Chiou 129). It has also been widely demonstrated that delay discounting can effect one's health, wealth, and happiness (Daugherty & Brase).

It has also been theorized that the digital age is leading humans towards an intensive "continuous present" – a culture defined by "doing" rather than "being". The continuous present is at work when the individual is occupied in some way, and time for contemplation and reflection is blocked (Voase 2). Our constant connection to electronic devices means that we are almost always 'doing' something, and this limits our ability to think about the future or partake

in delay discounting. An inability to remove oneself from the present and reflect on the past, or dream of the future, could have devastating impacts on all parts of one's life. Evidence of a dwindling patience is already becoming evident by examining some simple statistics. A prime example is saving money. The US Department of Commerce Bureau of Economic Analysis found that Americans' personal saving rates have dropped from 9.7 percent in 1982 to 3.6 percent in 2012. While a variety of factors can help account for this drop, a decrease this vast in nature can help be explained by a decrease in ability to think with a future oriented mindset.

The infatuation with instant gratification, and decrease in delay discounting, has also led to an increase in consumerism, as individuals seek out other forms of instant gratification. A consumer society considers consumption a route to personal happiness and enjoyment of life, and the consumption produces instant gratification (McGregor). The lack of a future oriented mindset allows individuals to ignore the need for savings, and instead seek out more instant gratification via consumption. We no longer purchase commodities just for their need; our purchases are therefore an important way in which identities are explored and projected to others (Government Office 33). Also adding to the problem for consumerism is "big data" and e-commerce. One could argue that the demand for more online shopping has made it quicker and easier, or one could argue that the quick and easy route of online shopping created an increase in demand, but either way e-commerce is a booming business. Companies, such as Amazon, are now offering same day delivery for some items, and it is difficult for a retail company to compete without an online ordering platform. "Big data" has a direct effect on consumerism because retailers are now able to custom tailor advertisements and products directly to the consumer, and this must be increasing purchase habits.

With the civilian adoption of the Web in the late 1990's and the subsequent devices that would follow, such as smartphones and tablets, a hyperconnected society has been created. The implications of this are immense, and many are still not known, but the immediate benefits from it are certainly welcomed happily by consumers. The possibilities of a hyperconnected world are nearly limitless, but the same power and speed that make these changes possible, could also be crippling to our society if humans do not continually check their relationship with technology. Further, a hyperconnected world is limiting our ability to delay gratification as many of our daily life activities have become, either instantaneous or simply extremely quick. Once again these implications are not fully known either, but a significant drop in savings for Americans' is certainly alarming, as are the effects of increasing consumerism. As we move forward it is most important to, simply be aware of these changes around us, and to question what the implications of new communication technologies will have on the fabric of our digital culture.

Conclusion

It is easy to become enamored with the convenience and improvements that digital culture has brought to our lives, but we must also be wary of this great and powerful revolution. The pace of the world around us continues to speed up with advancements in technology, and with the quickening of the pace has come changes in the way we interact, view ourselves, learn, reflect, and so much more. It can be very easy to get lost in all of this new technology and online platforms, especially at this pace, and that is why it is important to be aware of this. The concept of living in the continuous present, being unable to disconnect from devices, or the blurring of identities all seem to be possible consequences of our new digital era in the short term, but these short term consequences have severe long term consequences as well. One of the most serious

implications that we must be mindful of is constantly 'doing' instead of 'being'. We have seen, from the oral-to-print change, that these revolutions can alter the ways in which we learn and come to know things. If this strong of a change is possible from a shift in language and communication, then it is highly possible that hyperconnectivity is, in essence, forcing us towards a 'continuous present'. The constant state of 'doing' is easy to get wrapped up in with hyperconnectivity because it is fueled by instant gratification. But, importantly, our ability to dream, set goals, and plan is key to our development as people. In the near future we will need to make sure that we are not spending too much time just 'doing'.

As individuals, we must also be aware of what information we release online. Concerns over privacy have seemed to diminish over time with digital culture, and information that would not be normal to give out in print culture, is now becoming the norm. Private companies and the government are not the only people interested in this information. With a rise in digital culture and information sharing, we have also seen a rise in cybercrime and identity theft. This is just another way we are seeing our real world environments collide with our virtual environments. The blending of identities and environments is just another thing we must be aware of. With hyperconnectivity, it is becoming more difficult to discern the difference between what is work time and what is not, or what is my Facebook identity compared to my family identity. Our identities are key to our health and wellbeing, and they help us define who we are. A disruption in identities is sure to have an impact, but once again what that impact is we cannot be sure.

As the Internet of Things continues to expand we also need to be aware of just how connected we are to this technology. For now, hyperconnectivity refers to humans constantly being connected to social networks and the Internet, but soon it could refer not just to humans. It is not just humans and their communication devices that are connected to the Internet; now, our

appliances, cars, security systems, etc. are all capable of being connected to the Internet. The more objects and technologies we add to the Internet of Things, the more our life becomes automated, and the more we automate our life with hyperconnectivity, the less control we have. It seems that with the speed and pace of digital culture a lot of the future is just too unpredictable. With this in mind scholars in the humanities need to consistently synthesize literature about current technologies and their effects on the individual and society to keep up with the rapid pace of digital culture.

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