

Adrienne Redd
Sociology, Anthropology, and Criminal Justice
Arcadia University
adrienne@redd.com
April 2, 2009

Abstract

A survey of histories of telegraphy reveals parallels between the social impacts of the first form of instantaneous and later instantaneous and Internet-based communication. Research into the social patterns stimulated by Internet-based communication may be elucidated by creating a taxonomy of modes of communication and considering five social effects of telegraphy. The five social effects examined in telegraphy are: 1) telecopresence, i.e. contemporal sociability facilitated by instantaneous communication, 2) acceleration and globalization of commerce, 3) perpetration, policing and fear of crime and deviance, 4) employment and other opportunities for previously disempowered groups, and 5) social reconstruction of time. Modes of communication that are often conglomerated under "Internet-based" or "instantaneous communication" are broken out in order to compare the four most analogous forms to two modes of telegraphy.

Keywords: Internet, instantaneous communication, telegraph, telegraphy, telegram, telecopresence, social effects

Social Effects of Instantaneous Communication: Parallels between Internet-based Communications and Telegraphy

Introduction

Telegraphy catalyzed an elemental shift in social capabilities and patterns.

In 1837, the year in which the seventh American president, Andrew Jackson, left the White House, and in which Victoria came to the English throne, neither of these heads of state harnessing their total resources could send a message any faster than could Caesar Augustus two thousand years earlier, via messengers on foot or by horseback, or by pre-electric forms of signaling.

There were two ways other than by courier to send a textual message in 1837. One was by optical telegraph, an expensive (Crowley and Heyer 2003) semaphoric relay that was put into use in the Napoleonic era and could transmit a ten-word message. The other was by homing pigeon, an animal conditioned to *return* to a fixed point. E.g., if one traveled to the European mainland one could carry a living bird in a cage, and to release it with a note tied to its leg. It could then fly “home” to a predetermined point with the correspondence. (Communication via homing pigeons was the first business model of Reuters, the British news service that operates under the same name today).

This paper breaks telegraphy into two modes and compares those two with their closest analogs among four modes of contemporary instantaneous communication. Five social effects shared by telegraphy and Internet-based communication are considered.

The comparisons are intended to demonstrate that parallels between the two

communication capabilities can be substantiated and that future research into social effects of instantaneous communication may be benefited by comparison with telegraphy.

Literature on Impacts of Electromagnetic Telegraphy

Comparison of telegraphy and later instantaneous communication have been made by historians of technology, including Mumford (1967), Gabler (1988), Oslin (1992), Coe (1993), and Standage (1998). A few contributors from the world of business, including Yates and Benjamin (1991), Moore (1991/2001), and Phillips (2000) draw comparisons between adoption cycles and social and commercial impacts of earlier and later forms of instantaneous communication.

However, there is a dearth of work in sociology or other social theory comparing the social impact of telegraphy with that of Internet-based communications. Marvin (1988), Mattelart (2000), and Gitelman and Pingree (2003) are among the few who systematically compare social effects of telegraphy and Internet-based communication.

Marvin (1988) explicitly draws parallels between adoption patterns of different communication technologies. She writes, "In a historical sense, the computer is no more than an instantaneous telegraph with a prodigious memory, and all the communications in between have simply been elaborations on the telegraph's original work." In her introduction, she emphasizes underlying power dynamics and asserts that telegraphy and instantaneous communication capabilities that followed it were not so much initiators of new social patterns as amplifiers and new avenues for the exploited or suppressed to grasp for social power.

Mattelart (2000) offers one of the few works explicitly exploring parallels between sociopolitical effects of telegraphy and the Internet. With only superficial attention to the complexity of the effects of the two communications capabilities, Mattelart's main point is that telegraphy and Internet-based communication produced social disruption.

Mattelart's primary assertion is that globalization as a phenomenon was far more powerfully accelerated by the confluence of rail and telegraphy than by the faster and cheaper transportation and communication technologies of the 1980s and 1990s. He also asserts that globalization is a misnomer and produces much more of a social fracture than a unification, this point being related to Harvey's (1989) and Giddens's idea (1990) of the distancing of space and time produced by what these two authors term "postmodernity" and "late modernity" respectively.

Mattelart explores parallels in universalization, flow of trade, “world time,” consolidation of the power base of both the nation-state and metanational political structures, utopian expectations for the power of diplomacy, a shift to an information-based work force and economy (rather than agricultural or manufactured goods), industrialization of culture, propaganda, transnationalization and the “postnational economy.” Mattelart’s is a little book (123 pages) of very big ideas with almost no empirical basis for the comparison and no systematic comparison of the elements of the technologies compared such as Lubrano (1997) offers or Zhao (2006) recommends.

Although their book ostensibly only covers “new media” through 1915, Gitelman and Pingree (2003) also explicitly compare common social impacts of telegraphy and Internet-based communications. They discount Standage’s (1998) “collapsed” comparison between telegraphy and the Internet and emphasize the social impact revealed in the subgenre of telegraphic fiction, of which the most famous example is *Wired Love* (Thayer, 1853). They concur with Marvin (1988, p. 5) asserting that study of the social impact of telegraphy should be shifted from narrowly defined social trends to ways in which “groups ...negotiate power, authority, representation, and knowledge with whatever resources are available.”

There is a fourth relevant work. Lubrano (1997) offers a thorough and systematic analysis of social change brought about by telegraphy (but without comparison to impacts of Internet-based communication). Her analysis carefully considers forms of social, economic and political impact of telegraphy: Public diffusion/adoption, monopolistic/oligopolistic control by commercializers of telegraphy, the differing role of government in the US, UK and France, “habits” of communication and social use of telegraphy, employment opportunities for a new lower middle class, effects on law and law enforcement, and American nationalism. In spite of its emphasis on material power relations and exploitation rather than the effect of telegraphy on the imagination and how people see the world, this work is an excellent model for future study and theorization of social impact of Internet-based communication.

A number of business writers and historians of technology look at patterns of past adoption in order to project future patterns. This is the case with Yates and Benjamin (1991) who are historians of technology. Similarly, Moore (1991/2001) is a marketing expert offering a “technology adoption life cycle” for early adopters, mainstream adopters and late market in order to guide manufacturers of new technology in “crossing the chasm” from technophiles to the belly of the bell-shaped curves. Phillips (2000) offers a paper intended to guide marketing, also for the benefit of other businesspeople.

The majority of writers who touch on the social impacts of telegraphy (or make any comparison with social impacts of Internet-based communication) are historians or

historians of technology. Having lived through nearly a century of the use of telegraphy and into the beginning of the age of the Internet, Oslin (1992) traces the development of the Internet as a culmination of its predecessors but offers only administrative and technological details rather than social theory. Another historian, Standage (1998) titles his book on telegraphy, "the Victorian Internet" but draws no parallel in social patterns other than glancing ones, predominantly structuring the book as a history of electromagnetic telegraphy. Writers including Marvin (1988) criticize him for aggregating the Internet as one communication mode that is simplistically analogous to telegraphy.

Communication Capabilities before Electromagnetic Telegraphy

By the 1840s, before steel rails crossed westward across the North American continent, it took ten and half days (and cost a private person 25 cents) for a one-page letter to travel 850 miles from New York City to Chicago. By the 1850s, railroads reduced that message delivery to two days at a cost of three cents. In that same decade, the electromagnetic telegraph made the transfer of one page of information possible between New York City and Chicago in a matter of minutes. This shrinking of the globe did not go unnoticed. Under the title, "A New Table of Distance," the following appeared in (American) *Vanity Fair* (1860):

The distance between the Atlantic and the Pacific curtailed to eight days – Commencing with to-morrow the distance between the Atlantic and the Pacific will be lessened to little more than a week. Telegrams can be sent over the wires to St. Joseph on the Missouri River, whence they will be conveyed to the telegraph line at Placerville, which will transmit them at once to Sacramento and San Francisco.

The social effects of telegraphy's astonishing conquest of distance and acceleration in volume and speed of communication began when the technology became widely available to the public in the 1850s, subsequent to its first public demonstration in 1844.

Development of Telegraph Technology

A score or more of tinkerers and scientists might share the credit for the invention of telegraphy. Charles Wheatstone and William Fothergill Cooke assembled the first viable system widely available in England. Their system did not use the "Morse" code of dots and dashes but a five-needle key that pointed to a subset of letters of the Roman alphabet, referred to again under Perpetration, Policing, and Fear of Crime and Deviance.

Samuel Finley Breese Morse, remembered as the American father of telegraphy, was not an inventor and was not the first to develop a workable transmission system. He was an accomplished portraitist driven by happenstance and vision. While traveling on a ship in 1832, Morse met Dr. Charles Jackson of Boston (the inventor of anesthesia), who explained the theoretical principle upon which telegraphy is based – reliable modulation of shorter and longer taps over an electrical wire. Morse wished that he had received the news of his wife's death sooner, of which it took him seven days to learn while on that ship. To that end, he pursued development of an electromagnetic telegraph. Six years later, Morse demonstrated the telegraph on January 10, 1838 in a factory building at Speedwell, New Jersey – now a national historic site.

Cooke and Wheatstone's telegraph employed five iron needles that rested in a vertical position when not in use. Each needle was moved either to the left or the right by electromagnets. Twenty letters could be transmitted by pressing combinations of switches. In use by the early 1840s, the system's limitation of was that J, C, Q, U, X and Z were omitted, making letter substitutions necessary to spell "Kwaker" (Quaker), "Kween" (queen) or "Aks (axe)." One advantage was that operators who had not learned Morse code could use the system. Morse's collaborator, Alfred Vail, actually designed the telegraph key, sounder, and the alphabetic system of signal modulation referred to by laypeople as "dots" and "dashes" and by telegraphers as "dits" and "dahs." Not invented by Morse, who wanted to use numbers for alphabet letters, this code of modulation is nonetheless named for Morse. Using the transmission technology and the code of dits and dahs, operators could then spell out words and "talk" nearly instantaneously across miles of distance for the first time in human history.

On May 24, 1844, Morse gave Annie Ellsworth the honor of composing the first message sent on the first permanent American line between Baltimore and Washington, D.C. Knowing how pious Morse was she chose the biblical interrogative, "What hath God wrought?" (Proverbs 30:24-25).

Two Groups of Telegraph Users

In order to compare telegraph use to contemporary instantaneous communication, two groups of telegraph users in the late 19th-early twentieth centuries will be considered: operators and lay users. The two modes were personal

communication via telegraphy by operators when they were not sending the messages of others and messages sent by paying customers (both business and personal messages) transmitted through professional operators.

Telegraph operators learned Morse Code and listened to the “dits” and “dahs” received through the key. They then (until teletypes were invented in 1902 and commercialized in 1907) decoded messages letter by letter and wrote them down by hand.¹

The point to be drawn from the five parallels between social impacts of telegraphy and later instantaneous communication is that existing patterns of communication, alliances, gratifications, deviance and power struggles may be amplified rather than being completely remade by new technologies. This idea of the extension of socialization via new communications media is made by Brown and Duguid (2000), Lubrano (1997), and Ødegård (1994), among others.

This is also true for companionship, friendship, romance and courtship via telegraph. Accounts from newspapers and other periodicals show that telegraphy was quickly employed in the pursuit of sociability and love between telegraphers and members of the general public.

Though telegraphy had commercial users, there is also documentation of telegraph operators conversing *socially* among themselves while the line was not

¹ A automatic writing machine that recorded telegraph signals with pen on moving paper was innovated in 1888 by Elisha Gray, and demonstrated at the Chicago World’s Fair in 1893. Technical problems with the invention not corrected until the 1960s limited the use of the device to ranges of five miles (Coe, p. 21).

transmitting other messages. These exchanges to pass the time, or make friendly or even romantic contact can be compared to chat, IM, and texting (via cellular telephone), described in Table 1 with categorization by the time cycle, directionality and access.

The second group of lay senders of telegrams (the word for the *communiqués* themselves). These senders dispatched messengers or physically traveled until the era of telephones in telegraph offices starting with the one at 195 Broadway in New York City (New York Times, p. 191) to dictate or pen messages which were then coded and transmitted by operators.

Because of the high cost, telegrams were mostly used for business transactions, news transmissions, and personal emergencies. Other than businesspeople and journalists (who received discounts) most people transmitted only a few words, thus the adjective “telegraphic” that persists today, meaning brief or communicatively economical.

Differentiation of Forms of Instantaneous and Internet-based Communication

This refinement of categorization of Internet-based communication is based on Eriksen (2007), Weinberger (2002), Zhao (2003, 2006), and others who have recommended taxonomizing modes of instantaneous communication. Table 1 shows ten Internet-based forms of communication and one other form of instantaneous communication (texting via cellular telephones) and organizes them in terms of time cycle, directionality, and access. Time cycle refers to whether communication takes place in real time, asynchronously, or semisynchronously. Directionality refers to

whether communication is one-to-one, one-to-many (as is the case with “mass” media), and/or within a defined group. Socioeconomic class and social capital are not closely examined in this paper (but are a realm for future theorization of affinities and usage by various groups. The third dimension of access refers to the openness of a given communication form – its structural characteristics as well as any cost associated with it availing widely or to more limited strata of society. Table 1 juxtaposes these modes of contemporary instantaneous communication with two modes of telegraphy.

Table 1. Time Cycle, Directionality and Access in Modes of Instantaneous Communication

	Description	Time cycle	Directionality	Access
email	Cousin to written/ printed medium of the letter (which can also be CCed or BCCed to more than one recipient).	asynchronous/ semisynchronous – turn taking can take place over hours, days or longer but is also possible in near real-time.	one-to-one or one-to-many	Limited access in that the missive must be precisely addressed. Largely private and unmediated. Requires access to computer and connection to Internet.
emailing list/ listserv	Regular email from a person or organization; cousin to the print medium of a newsletter. In a listserv, aspects of sending and response are automated.	asynchronous – messages are archived and searchable.	one source-to-many recipients	Limited access in that one has to be subscribed to the emailing list. Some regulation.
Usenet/ newsgroup	Usenet/newsgroup (or chat) are email with the capacity for asynchronous multilogue. Can also be thought of as an electronic bulletin board on a particular topic of interest.	asynchronous – permanently or semipermanently visible. Cousin to bulletin board. More permanent, so that it is possible to search archived posts.	contact among clearly defined group	Open access to view discussions but necessary to register in order to post. ²
public or lay use of telegraphy	Purchaser dictates or writes down message to be encoded, transmitted, and sent. Recipient receives written, delivered telegram.	asynchronous – written, delivered message.	one-to-one	Limited access in that telegram is sent from telegraph office and purchased by the word.
operators'	Operator fluent in Morse code-	synchronous – impermanent.	similar to a	Open – unlimited and

² An artifact of the openness is that where discussion on a special topic is unmediated, it has the capacity to attract “true believers.” Lack of moderation can lead to an aggressive tone.

use of telegraphy	to-alphabet translation hears spelled-out words.		party line in telephony	uncontrolled subsequent to training in Morse Code and use of the key.
-------------------	--	--	--------------------------------	---

Table 1. (continued)

	Description	Time cycle	Directionality	Access
instant messenger (IM)	Window-based text-only dialogue with other users invited to converse. A “room” dedicated to a particular topic, with multiple participants can also be set up.	synchronous – impermanent.	one-to-one or though possible to have simultaneous conversations.	Limited access since conversants sign up with one another and may block other would-be conversants.
chat room	Closed, virtual “room” provided by various companies (AIM, IRC, ICQ, Google chat, Yahoo IM) that participants “enter,” usually to talk about an agreed-upon topic.	synchronous – impermanent. Participants not physically copresent but contemporal and contributing to multilogue	simultaneous small group contact	Limited – sometimes closed until user registers with unique username and password. However, largely unmediated or controlled.
texting (via cell phone)	Extraordinarily close in use and social affinities to IM (and telegraphy between operators) with main difference being that transmission tool is a (portable) cellular telephone, not a stationary computer.	near-synchronous – impermanent. Closest to operator-to-operator in time cycle.	one-to-one or one-to-many – cell phone numbers are more difficult to acquire than email lists, limiting bulk testing somewhat.	Limited access because the sender needs to acquire the recipients cell phone number in order to send. Also, sender and recipient pay to send and receive message.
Massively Multi-Player Online	Typed and audio conversation ongoing during fantasy or other game. Conversation can be on topic or other. Used for social	synchronous – impermanent, though it is possible to record gaming sessions.	simultaneous small group social contact	Limited access because the participants are paying subscribers.

Games (MMPOG)	contact as well as ostensible purpose of the quest, raid, confrontation, etc.			
------------------	---	--	--	--

Table 1 (continued)

	Description	Time cycle	Directionality	Access
website	Linked, layered “pages” with text of various layout, fonts, and capacity for images and sound – cousin to medium of magazine. There exist websites with specialized purposes and demographic affinities.	asynchronous – remains permanently or semipermanently visible. Can be updated in nearly real time (“news cycle” of a few hours)	one-to-many with varying feedback, discussion boards and/or email contact with author(s).	Usually open access other than specialized sites or those for proprietary projects that are locked with a password.
blog	Related to website but oriented toward text not pictures, video, etc. Chronologically linear entries by known author. Cousin of the opinion column in a print periodical or newspaper.	asynchronous – semipermanent. Updated in nearly real time (“news cycle” of a few hours). Some bloggers post multiple times daily.	one-to-many with varying feedback. Author may develop notoriety so tone differs from other web presence.	Open access to read site. Varying degrees of feedback.
direct revenue website	Classified ad or other high-profile website oriented toward buying, selling or exchanging goods or services. Encrypted transmissions allow virtual monetary exchanges. Examples: EBay, Craig’s List.	asynchronous – statutory 10-year record retention. Ratings of buyers and sellers to promote trust and lubricate transactions.	largely non-social; one-to-one contact is geared toward transaction only.	Open access – necessary to register or some or be invited on others (registration usually free of charge)
ad-supported website	Content-rich, high-profile website providing information or service. Supported by advertising, views, site visits, or auction for keywords as in the	asynchronous – permanent	largely non-social; one-to-one contact is geared toward transaction.	Open access. Varying degrees of feedback.

	case of Google). Examples include You Tube, Internet Movie Database.			
--	--	--	--	--

Two Modes of Telegraph Use Correspond to Forms of Instantaneous Communication

This paper differentiates two modes of telegraphy use and compares them most closely to three modes of Internet-based communication plus texting via cell phone. The thesis is that there are parallels in the social impact of telegraphy and Internet-based communication in: 1) telecopresence, 2) acceleration and globalization of commerce, 3) crime and deviance, 4) employment and other opportunities for previously disempowered groups, and 5) social reconstruction of time. These warrant further investigation.

Zhao (2001, 2003, 2004) is the originator of the term “telecopresence,” defined as emotional togetherness across physical space facilitated by instantaneous communication. Zhao (2001, p. 2) identifies three components of telecopresence: 1) synchronous or truly instantaneous, as is copresent conversation, 2) lagged, or asynchronous telecopresence, and 3) virtual telecopresence that is two-way as in a Skype interaction (not one-way as in the telepresence to watchers of entities on television).

The decentralized communication of the Internet is based on sending a chunk or “packet” of communication. An important addition to Zhao’s theorization of telecopresence is that it is not solely the instantaneousness of telegraphy (or later electric or electronic communications) per se that is new. The innovation of telegraphy was the “syn-ack” component of packet technology also at the heart of Internet-based communications. An exchange via packets is opened with the hail, “I would like to

synchronize my computer with yours” or “*syn.*” The receiver then records the sequence number from the sender, and replies with an *acknowledgment* or “*ack.*” This dialogue— with a green light that the receiver is ready and acknowledgment that the packet has been received exists at both the electrical and functional level of telegraphy and this was the first time in the history outside of voice and face transfer of information that this was the case (outside of the few exotic non-face-to-face but not technologically amplified examples such as yodeling and Canary Island whistle language— both arguably extensions of voice and therefore both limited in a bodily way). Technological amplification plus technological and social reciprocity is what differentiates telegraphy and subsequent communications forms from all previous communication forms.

The syn-ack component of telegraphy and later instantaneous communication is also fundamentally different from the sociomental make-believe explored by Chayko (2002). The “ack” both provides feedback and inspires confidence in both communicators that response is forthcoming so that the connection is not merely imagined nor a message in a bottle— cast into silent seas.

All of the forms explored in Table 1 share the reciprocity of the “syn-ack” dynamic, though it is diminished with the last four types, which are all types of websites. These last four are the virtual type of telecopresence set out by Zhao (2001), in which the website is a proxy for its author(s).

Table 1 highlights the forms of instantaneous communication most analogous to two major groups of telegraphic users. Use by the general public of telegraphy in its

first decades was most similar to sending correspondence via the postal service. The equivalent today is electronic mail or email, originally spelled with a hyphen as “e-mail.” Telegraphy by the public was asynchronous, one-to-one (different from email which can be sent one-to-many) and constrained by the sender’s need to know the specifics of the closest telegraphy office of the addressee in order to close the loop of communication (unlike physical postal delivery, which can be mass-mailed to “occupant” or “resident” and still reach its destination).

Operator’s use of telegraphy can be analogized most closely to chat, IM, and texting. Operators “chatted” one-to-one in real time (without writing down the conversation). Access was limited in that operators had to be trained and employed. However, once they were working for a telegraph office, the conversations were uncensored, unrecorded, and not monitored by any authority, though other operators could hear a “conversation.” Telegraph lines were open and any operator on a given line could hear the code being generated by any other operator, similar to “party lines” used in the mid-20th century in telephony, on which one could hear other conversations when one picked up the telephone to make a call.

Access by operators also bears comparison to Usenets/ newsgroups, and MMPOGs shown in Table 1. Users are elite in some sense, but access is unrestricted and unmediated once elite membership is attained. (Listservs differ in that there is moderation to persuade participants to stay on point, to discourage use of profanity, and to discourage overly intense or intimate emotional content.)

Selection of Five Social Impacts

The selection of the five social impacts: 1) telecopresence, 2) commerce, 3) crime and deviance, 4) opportunities for previously disempowered groups, and 5) social reconstruction of time builds on the taxonomy of modes and considers a range of social effects both cultural and economic at micro, meso and macro social levels.

Comparison between texting /IMing and communication between telegraphers is being compared in the psychosocial interaction of telecopresence in Table 2. Social effects catalyzed by email / public use of telegraphy are being comparing in the other four social effects shown.

Table 2. Dimensions of Five Social Impacts of Instantaneous Communication

	cultural-economic	micro-meso-macro
telecopresence	psychosocial	micro
accelerated-globalized commerce	econo-cultural	macro
crime and deviance	econo-cultural	meso
opportunities for previously disempowered groups	econo-cultural	meso-macro
social reconstruction of time	paradigmatic-cultural	macro

Telecopresence is a psychosocial phenomenon that occurs in dyads or very small groups. Accelerated or globalized commerce is an economic and macro consideration. Crime and deviance can be considered both as economic and sociocultural responses to new technologies and occur at the meso level of society. Opportunity for previously disempowered groups is an issue of gender, class, ethnicities and other disadvantage for subaltern groups and is a meso-macro phenomenon. Perpetration of economic crime

and deviance and employment opportunities can be regarded as subcategories under commerce. The social re-construction of the paradigm of time is a cultural macro phenomenon. Standardization and reconceptualization of time constitute a fundamental and worldwide cognitive shift.

Contemporal Sociability Facilitated by Instantaneous Communication

Defined as emotional togetherness (including feedback) across physical space enabled by instantaneous communication, “telecopresence” is a term originated by Zhao (2001, 2003, 2004). The assertion of this paper is that the syn-ack property of telegraphy created the possibility for telecopresence – emotional, social and reciprocally relations at a distance such as those experienced when people are physically and temporally copresent.

Facilitation and Globalization of Commerce

That telegraphy facilitated and further globalized commerce has been documented by Gabler (1988), Oslin (1992), Lubrano (1997), Coe (1993), and Standage (1998) among others. The capability for merchants in Great Britain (and other colonial powers) to send dispatches to branches in distant colonies, the ability to order goods via telegram, confirm that they had been sent, etc. accelerated and extended commerce, with political, social and other effects are noted in empirical research and by numerous authors. Marvin (1988), Lubrano (1997), and Mattelart (2000) have examined how telegraphy in some cases exaggerated power dynamics to the advantage of the

powerful and in other cases allowed for escape, innovation or opposition on the part of previously disempowered groups.

There are numerous parallels between facilitation and acceleration of commerce because of telegraphy and the effects of faster, cheaper communications via the Internet; these have not been explored as thoroughly, however. Future research could employ the differentiation of modes of communication presented here to systematically compare and contrast how telegraphy and modes of communication via the Internet have stimulated commerce.

Perpetration, Policing, and Fear of Crime and Deviance

Breaking of unwritten rules and transgression of boundaries not yet fortified has arisen with the new communications capabilities of telegraphy and later instantaneous communication. Such deviance and disobedience has been noted by many authors including Connolly 2004, Standage (1998), Thurlow, Lengel, and Tomic (2004), and Wall (2001). From historical accounts, incidents of deception and theft via telegraphy emerged almost as soon as the technology became available to the public (Marvin 1988, p. 92, Standage 1998, p. 50, Connolly 2002, p. 3). Crimes and publicly expressed fears about increased deviance enabled by telegraphy are also mentioned in Coe (1993), Gabler (1988), Marvin (1988), and Oslin (1992)

Mentions by historians of crimes and perceptions of crimes and deviance via telegraphy fall into the categories of: 1) deception and cheating, 2) (sexual) deviance and libertinism and general societal fears about new capabilities for certain groups and 3)

attempts by the disempowered to collude to their benefit or, more commonly, effort by the already-powerful to concentrate their powers using new communications capabilities.

There is little systematic accounting of increases in theft and other crime enabled by telegraphy, but public accounts of the late 19th century have numerous expressions of fears of increased crime because of a new way to communicate. Cited by Connolly (2002, p. 3) Inspector Jon Bonfield asserted in the *Chicago Herald* in 1888: "It is a well-known fact that no other section of the population avail themselves more readily and speedily of the latest triumphs of science than the criminal class." There are also, according to Connolly (2004, p. 3), "numerous reports of instances between 1840 and 1880" of gamblers attempting to delay (telegraphed) results of games of chance and horse racing so that they could place bets on a known result. This resulted in a law in England that made it a crime to willfully damage telegraph equipment.

As is the case with Internet-based communication and access to information, telegraphy brought concerns about security and potential for collusion. Oslin (1992, p. 132) reports that there was a concern during the American Civil War that the press would leak secret military or governmental information.

According to Oslin (1992, p. 285) technological innovations in telegraphy, telephone and other branches of communication also led to new laws and violations of both intellectual property laws and antimonopoly laws. Oslin reports that in 1875, Congressman Charles A. Sumner gave a speech on this topic in San Francisco

conveying fears about of the use of the telegraphy as an instrument of power and control:

The Western Union has a twin connection with another incorporated thief and highway robber known as the Associated Press. They are banded together in the strong bond of mutual plunder and rapacity against the people. (Oslin, p. 241).

There seems to be an even greater number of examples of telegraphy being used to fight crime, however. An early and notorious example shows both how the telegraphy was used to capture a criminal (and how humans as filters for information complicate the process of using a new communications medium).

Recounted by Gay (1957), Standage (1998, p. 50), and Miller (2002), John Tawell poisoned his mistress Sarah Hart in 1845 in the town of Salt Hill near Slough, England. Tawell then wearing the garb of a Quaker took a train to London. Miss Hart had called out in her dying throes, attracting the attention of a witness who had seen Tawell leaving her residence. The rural police telegraphed to Paddington Station, describing the murderer and asking that he be detained. "He is in the garb of a Quaker," read the proposed message, "with a brown coat on, which reaches nearly to his feet."

The message had to be relayed through the station at Slough. Attempting to spell "Kwaker" because there was no 'Q' in the alphabet of the five-needle equipment (see Development of Telegraph Technology) and because the clerk at Slough was interrupted by the clerk at Paddington, who asked him to "repent," presumably for casting aspersions on a supposedly religious person. The Slough clerk's repetition was interrupted again, until a boy at Paddington urged that Slough should be allowed to

finish the message. “Kwaker” was then understood, and as soon as Tawell stepped out on the platform at Paddington the police spotted him, followed him arrested him in a coffee tavern.

Tawell was caught, tried and hung, and the notoriety of the case demonstrated how telegraphy could be used to convey information capture criminals. Some historians attribute the acceleration of the adoption of telegraphy in England to the notoriety of the case during the early used of telegraphy.

Telegraphy continued to play a role in law enforcement. As late as the 1960s, a map of 38,000 miles of telegraphy lines was availed to the National Crime Information Center of the Federal Bureau of Investigation (of America) to enable federal, state and local official to track criminal activity, criminal movements and stolen property (Oslin 1992, p. 353).

From accounts in periodicals of the 19th century, the public paid the greatest attention to the potential for suitors and lovers, particularly young women, to engage in courtship (or even marriage in a few celebrated accounts) via telegraphy. Women were occasionally cast as victims in telegraph-enabled romance and weddings but a number of cases seem to indicate that they were exercising their wills against the wished of elders.

Employment and Opportunity for Previously Disempowered Groups

Being ability to communicate in such a way that one’s face and body are not present is at the center of fears of crime and deviance enabled by telegraphy, and later

by Internet-based communications. Unlike telephony that bears the bodily trace of a recognizable voice, telegraphed and emailed (texted, etc.) messages can be completely anonymous. This is one reason for striking similarities in the social impact of telegraph and later forms of disembodied instantaneous communication. Telegraphy also raised societal concerns because people who used it could communicate without traveling great distances or being seen. The ability for young people, in particular, to conduct personal communications by telegraph opened freedoms for them and concerns on the part of their parents and guardians.

From the 19th into the 20th century, a vast web of etiquette, gate-keeping and other restrictions impeded women from communicating with suitors and pursuing other social contacts of their choice; the barriers were as much informational as they were material. Evasion of this control, empowerment, and new forms of employment for women and other groups were made possible by telegraphy. Similarly, subaltern and oppressed groups have seized powers for themselves because of contemporary instantaneous communication.

Perception of the *potential* for crime projected from the few incidents seems to be more prevalent in newspaper and other accounts of the late 19th and early 20th century. Resistance to new communication (and other) technologies seems to be framed in terms of warnings about emergent deviance and criminality. Related to public fears about the use of telegraphy to engage in what was considered indecorous behavior or to commit crime is the liberation for some groups that came with telegraphy.

With the capacity to transmit one's words telegraphically without needing to transport one's body came both liberation from Victorian strictures for young women (and men) and fears of impropriety. Marvin (1988, p. 5) examines this reshaping of power relations in writing, "New media intrude on... negotiations by providing new platforms on which old groups confront one another. Old habits of transacting between groups are projected onto new technologies that alter, or seem to alter, critical social distances. New media may change the perceived effectiveness of one group's surveillance of another, the permissible familiarity of exchange, the frequency and intensity of contact, and the efficacy of customary tests for truth and deception. Old practices are then painfully revised, and group habits are reformed."

Marvin's assertion is consistent with that of Cassell and Cramer's (2008) assertion that the "outrage" and "panic" over the potential for victimization of girls via Internet-based communication "has nothing to do with the actual risks faced by girls on the Internet." Using critical discourse analysis, the authors examine public expressions of fear about four new communications technologies and conclude that what is being framed as a warning and a concern is simply a way of blocking girls from attaining technological proficiency in a medium that is seen as inappropriate for them, in part because of the liberation it affords.

The gendering of work to the diminishment of women's economic opportunities and social independence in the 19th century is well-documented (Jordan 1989, Coffin 1996, Meyer 2000). Numerous theorists of labor (Gabler 1988, Downey 2002) and of

women and work (Hewitt and Lebsack 1993, Jepsen 1997, Jepsen 2000), and of telegraphy have noted the liberation and opportunity afforded to women in the mid-19th century when they could earn an income in a new realm of employment not yet impenetrably gendered.

Both Lubrano (1997, p. 135) and Gabler (1988) note that telegraphy provided employment for women and Irish immigrants, particularly during their 19th century migration to the U.S.

The American census of 1860 lists approximately 2000 men who were employed as telegraph operators. Perhaps 100 or so women were similarly employed, though it is difficult to estimate the number with any certainty, since the census of 1860 did not break down occupations by gender. Virginia Penny, whose book, *How Women Can Make Money*, was written in the early 1860's, noted that around fifty women were employed at that time in the Northeast by the New York and Boston Magnetic Telegraph Company; it is reasonable to assume that an equal number of women were employed in other parts of the country. Women worked as telegraphers from the inception of the telegraph industry, in the late 1840s; it was one of the first, if not the first, technical profession open to women according to Jepsen (1997).

By 1870, the American census listed four percent of telegraphers as women. The peak number of telegraphers in the U.S. occurred in 1920, when about 21 percent or nearly 80,000 telegraphers were women. (Jepsen 1997) They were educable enough to learn Morse code and relay messages but came predominantly from a working class or

lower middle class background. (Jepsen 1997)

Gabler (1988, pp. 78) offers case studies and anecdotes providing empirical basis for assertions about immigrants groups – Irish, and also Germans – who would have previously been blocked from climbing from low level service jobs to management or who would have been relegated to the industrial class. With the inception of a new technology, they were able to enter the communications industry as telegraph operators. Gabler demonstrates this with primary source letters, newspaper texts and other texts that indicate that immigrants who had performed industrial work were eager to have their sons and daughters have “white hands” or “clean fingers,” and light, pens, pencils and paper around them (Gabler 1988, p 90).

This willingness for a social disempowered group to enter a new field because of discrimination in other points of entry to the economy is related to Sowell’s (1975, 1981) concept of a “middle man minority,” examples being Jews entering the film industry or Koreans opening convenience markets in blighted urban neighborhood; disadvantaged groups are willing to take a risk to advance themselves. A survey of women telegraphers in 1880 showed over seventy percent of them to be Irish (Gabler 1888 p. 119). The census of 1900 further showed that over forty percent of female telegraphers were Irish. This trend was reinforced by women being perceived as extraordinarily competent as telegraphy operators and there being no law at the time against paying them lower wages than men; the combination made them highly desirable as workers.

Other groups not examined here included boys (Downey, 2002) who could find honest and gainful employment as telegraph messengers; and as is the case today with people who migrate from poorer to richer countries for economic opportunity, communication technology of the late 19th century also fueled massive-scale migration from poorer to richer countries because would-be immigrants were able to communicate reliably with those who had already made the trip.

Standardization and Social Reconstruction of Time

Scholarly and other writing on the reconceptualization of time during the inception of modernity and the age of nationalism is the most fascinating of accounts of social change due to communications. Mumford (1966) recounts how the clock was created by monks in the Middle Ages and subsequently adopted by the rest of society. He views this paradigmatic tool rather than the steam engine as the pivotal invention of the Industrial Revolution. He identifies the clock and subsequent human control of time and time use as a catalyst of modernity and the Industrial Revolution.

Auerbach (1946/1953, p. 3-23) and Anderson (1983/2006, p. 25) further assert that modernity brought with it the perception of simultaneity. Anderson goes on to elaborate that the modernity of the age of nations was specifically secular (not time under the management of a divine being).

The triggers for the social reconstruction of time were new technologies and capabilities. When people began traveling by train, hundreds of miles in a day, the calculation of time became a serious challenge. Operators of the new railroad lines

realized that a new time plan was needed in order to offer a uniform train schedule for departures and arrivals.

Since every city used a different time standard, there were over 300 local sun times to choose from. The establishment by railway management of 100 railroad time zones proved to be an unwieldy solution.

Standardization of time occurred as a direct result of the confluence of telegraphy and rail transportation. By the mid-19th century, the synergy of rail travel with telegraphy necessitated standardization of time. Until the invention of telegraphy and train travel it took sufficient time to communicate across or traverse physical distance that local sun time sufficed. With faster travel, a passenger moving east or west had to change his or her watch by one minute every twelve miles. When the transatlantic line was successfully laid in 1866, people could communicate across a quarter of a day, by sun time.

In 1830, the U.S. Naval Observatory was created to cooperate with Great Britain's Greenwich Observatory to determine time based on astronomical observations. In 1847, The Royal Greenwich Observatory established an official standard of Greenwich Mean Time for England, Scotland, and Wales. This was immediately adopted by the Railway Clearing House and by almost all railroads the following year.³

³ It was gradually adopted for other purposes, but a legal case in 1858 held "local mean time" to be the official time. This changed in 1880, when GMT was legally adopted throughout Great Britain (Howse (1997).

A pre-1883 clock in the Budapesti Történeti Múzeum illustrates the mind-boggling difficulty of time agreement as the world began to globalize due to rail travel and telegraphy in the mid-19th century. It displays sun times in 36 European cities in contrast to a central dial showing sun time in Budapest, Hungary.

At noon on November 18, 1883 at the request of the railroad companies, the U.S. Naval Observatory changed its telegraphic signals to correspond to four standard time zones for the continental U.S. Lubrano (1997, p. 118) notes that federal government assumed "responsib[ility] for applying telegraphic technology to time, standardizing it and disseminating it across the entire United States."

Today the 24 time zones to which inhabitants of the earth conform are used as a direct result of rail travel and telegraphy. Around the globe, 24,000 miles in circumference, people inhabit a 1000-mile wide zones behave in concert because of the social alignment of time. Bostonians and people in Traverse City, Michigan may go to work or eat or go to bed at about the same time, though the sun is in a different place in the sky where they are. The sun set at 8:25 pm on June 20, 2009 in Boston, but the sky remained light until after 10 pm in northern Michigan, which is in the same time zone. Conversely, residents of Nevada and Utah may separate their activities to a greater extent because the former is in Pacific Time and the latter in Mountain Time.

Ongoing social reconstruction of time because of contemporary communication capabilities is still underway. Quantitative research on the social impact of the Internet is largely done as multiple regression analysis on survey data about time-use.

Weinberger (2002), Zhao (2006) and others note that time-use analyses, even by the same authors revisiting their work, produce contradictory findings as to whether Internet-enabled communication forms produce more social ties, or fewer, impoverishment of time spent on other activities, or enrichment, etc.

Researchers and theorists have only begun to consider how the on-demand and asynchronous services and activities availed through the Internet will shape people socially and in terms of their conception of time. Weinberger (2002) says:

My time with EBay was different. As I investigated different auctions, placed a bid, and checked back every few hours to see if I'd been outbid, I felt as if I were returning to a story in progress, waiting for me whenever I wanted. I could break off in the middle when, for example, my son came home, and go back when I had the time. The Web is woven of hundreds of millions of threads like this one. And, in every case, we determine when and how we will participate based solely on what suits us. Time like that can spoil you for the real world. (Weinberger, pp. 6-7).

One social remaking of time as a result of Internet-based communication is for those who order from online catalogs, or who use call centers, help desks or libraries. That such resources are now presumed to be available 24 hours per day and all but a very few days per year means that people can order goods or conduct research around the clock. This may have a *fragmenting* rather than unifying (as in the case of the time zones) effect on social patterns as consumers revert to their own idiosyncratic body "clocks." This may one aspect of what Weinberger (2002) is implying.

Related to this phenomenon is the shift scheduling of workers thousands of miles away for whom it is day when others want online access to websites or other resources at night. Specifically, the desire of companies or institutions to serve first world clients

around the clock drives the employment of English-speaking staffers in the Indian subcontinent.

This potential disruption of the social time of workers would be consistent with Sassen's (1991, 1994, 1998) analysis of a globalized society in which the service class convolutes its patterns to accommodate the needs of a professional class.

Social reconstruction of time as a result of the communications capabilities of telegraphy and the Internet offers the greatest opportunities for both original theory and original research. With a foundation like the literary analysis from Auerbach (1946/1953) and exploration of the centrality of time to the imagining of the nation-state (Anderson 1983/2006; Giddens, 1990; Fukuyama, 1992 and Albrow 1996) the conception of time can be further traced through modernity, the industrial revolution, the information age and beyond.

Conclusion

The goal has been to improve the explanatory power of research into the social effects of the Internet by differentiating two modes of use of its predecessor, the telegraph, and comparing them with four forms of Internet-use.

The impact of telegraphy occurred in the context of several emergent and interrelated technologies, including rail travel, standardization of manufactured parts, the typewriter, etc. This said, Checkland (1964) identifies the electric telegraph as the single most important innovation demarcating the second phase of the industrial age, saying that the telegraph "revolutionized" communications "throughout the world."

For the scholar who concurs that there are useful parallels between social changes influenced by the telegraph and by the Internet, future work in understanding emergent and magnified social patterns entails sorting out the influences of other technologies, refining the taxonomy of Internet-based communication modes and selecting a methodology. Exploration of the effect of the telegraph on the public imagination regarding perception of crime and deviance and in the social reconstruction of time are possible via critical discourse analysis of newspapers and other publications, as has been suggested by Marvin (1988) and Cassell and Cramer (2008). The second reference section listed the popular sources of account from the era of early telegraph use.

There are also crime records available showing the actual number of deceptions and thefts via telegraphy; authors such as Naím (2005) and Wall (2001) have begun this tabulation in connection with the Internet.

Power dynamics among groups may not be fundamentally transformed but their struggles may be transported to new forums. Accepted scholarship on identity, representation, intimacy versus social distance, and social experimentation versus surveillance and control will all come into play. With a clearer differentiation of the modes of Internet-based communication and further unpacking of the five social effects, there are promising areas for future inquiry.

REFERENCES:

- A New Table of Distances. (April 21, 1860). New York: *Vanity Fair*. 1(1): 267.
- Albrow, Martine (1996). *The global age: State and society beyond modernity* (Stanford, CA: Stanford University Press)
- Brown, John Seely & Duguid, Paul. (2002). *The Social Life of Information* (Boston: Harvard Business School Press).
- Checkland, Sydney George. (1964) *The Rise of Industrial Society in England 1815/1885* (London: Longmans).
- Chayko, Mary. (2002). *Connecting: How we form social bonds and communities in the Internet age* (Albany, NY: State of University of New York Press).
- Coe, Lewis. (1993). *The telegraph: A history of Morse's invention and Its predecessors in the United States* (Jefferson, NC: McFarland & Company, Inc).
- Coffin, Judith. (1996). *The Politics of Women's Work: The Paris Garment Trades, 1750-1915* (Princeton, N.J.: Princeton University Press).
- Connolly, Kevin. (2004). *Law of Internet security and privacy* (New York: Aspen Publishers Online).
- Cassell, Justine. and Cramer, Meg. (2008). 'Digital Young, Innovation, and the Unexpected,' (Cambridge: *MIT Press Journals*): 53-75.
- Crowley, David and Paul Heyer (eds) (2003) 'Chapter 17: The optical telegraph' in *Communication in History: Technology, Culture and Society*, (Fourth Edition). (Boston: Allyn and Bacon): 123-125.
- Downey, Gregory. (2002). *Telegraph Messenger Boys: Labor, Communication and Technology* (New York: Routledge).
- Eriksen, Thomas Hylland. (2007). 'Nationalism and the Internet', *Nations and nationalism* 13(1): 1-17.
- Fukuyama, Francis. (1992). *The end of history and the last man* (New York: The Free Press).
- Gabler, Edwim. (1988). *The American Telegrapher, A Social History, 1860-1900*. New Brunswick, NJ: Rutgers University Press.

- Giddens, Anthony. (1990). *The consequences of modernity*. Stanford, CA: Stanford University Press.
- Gitelman, Lisa. and Geoffrey B. Pingree. (2003). *New Media, 1740-1915*. MIT Press.
- Harvey, David. (1989). *The condition of postmodernity: An enquiry into the origins of cultural change*. Cambridge, MA: Blackwell.
- Hewitt, Nancy. and Suzanne. Lebsack. (1993). *Visible women: New essays on American Activism* (Chicago: University of Illinois Press).
- Howse, Derek. (1997). *Greenwich time and the longitude* (London: Philip Wilson).
- Jepsen, Thomas. C., (1997). *Ma Kiley: The life of a railroad telegrapher* (El Paso, Texas: Texas Western Press at The University of Texas at El Paso).
- Jepsen, Thomas. C., (2000). *My sisters telegraphic: Women in the telegraph office 1846-1950* (Athens, OH: Ohio University Press).
- Jordan, Ellen. (April 1989). 'The exclusion of women from industry in 19th-century Britain', *Comparative studies in society and history*, 31(2): 273-296. Cambridge: Cambridge University Press.
- Lubrano, Annteresa. (1997) *The Telegraph: how technology innovation caused social change* (New York: Garland Publishing, Inc).
- Marvin, Carolyn. (1988). *When old technologies were new: Thinking about electric communication in the late 19th century* (New York: Oxford University Press).
- Mattelart, Armand. (2000). *Networking the world: 1794-2000*. L. Carey-Libbrecht and J. A. Cohen (trans) (Minneapolis: University of Minnesota Press).
- Meyer, M. (2000). *Care Work: Gender, Labor, and the Welfare State* (New York: Routledge).
- Miller, Geoff. (December 2002). 'Famous murderer caught by the wire', *The Pharmaceutical Journal*. 269(21/28): 905-907.
- Moore, G. (1991/2002). *Crossing the chasm: Marketing and selling high-tech products to mainstream customers* (New York: HarperCollins).
- Mumford, L. (1967). *Technics and human development* (New York: Harvest/HBJ).

- Naím, M. (2005). *Illicit: How smugglers, traffickers and copycats are hijacking the global economy* (New York: Doubleday).
- Ødegård, O. (1994). 'Telecommunications and social interaction – Social constructions in virtual space', Oslo, Norway: *Teletronikk* 4(93).
- Oslin, G. P. (1992). *The Story of Telecommunications* (Macon, Georgia: Mercer University Press).
- Phillips, R. (June 2000). 'Digital technology and institutional change from the gilded age to modern times: the impact of the telegraph and the Internet', *Journal of Economic Issues*. 34(2): 226-250.
- Sassen, Saskia. (1991). *The global city* (Princeton, NJ: Princeton University Press).
- Sassen, Saskia. (1994). *Cities in a world economy* (Newbury Park, CA: Pineforge Press).
- Sassen, Saskia. (1998). *Globalization and its discontents: Essays on the new mobility of people and money* (New York: The New Press).
- Sowell, Thomas. (1975). *Race and Economics* (New York: David McKay Co).
- Sowell, Thomas. (1981). *Ethnic America: A history* (New York: Basic Books).
- Standage, Thomas. (1998). *The Victorian Internet : The remarkable story of the telegraph and the 19th century's on-line pioneers* (New York: Berkley Books).
- Thurlow, Crispin, Laura Lengel and Alive Tomic. (2004). *Computer mediated communication: Social Interaction and the Internet* (Thousand Oaks, CA: Sage).
- Wall, David. (2001). *Crime and the Internet* (New York: Routledge).
- Weinberger, David. (2002). *Small pieces loosely joined: a unified theory of the web* (Cambridge, MA: Perseus).
- Yates, JoAnne. and Robert I. Benjamin. (1991). 'The Past and Present as a Window on the Future', in Michael S. Scott Morton (ed), *The Corporation of the 1990s: Information Technology and Organizational Transformation*, (New York and Oxford: Oxford University Press): 61-91.

Zhao, Shanyang. (2001). 'The increasing presence of telecopresence in the Internet era' presented at the annual conference of the American Sociological Association.

Zhao, Shanyang. (2003). 'Toward a Taxonomy of Copresence', *Presence*. 12(5): 445-455.

Zhao, Shanyang. (2004). 'Consociated contemporaries as an emergent realm of the lifeworld: Extending Schutz's Phenomenological Analysis to Cyberspace', *Human Studies* 27(1):91-105.

Zhao, Shanyang. (2006). Do Internet users have more social ties? A call for differentiated analyses of Internet use. *Journal of Computer-Mediated Communication*, 11(3), article 8.

Zhao, Shanyang. (2007). Internet and the lifeworld: updating Schutz's theory of mutual knowledge, 20(2), *Information Technology & People*.