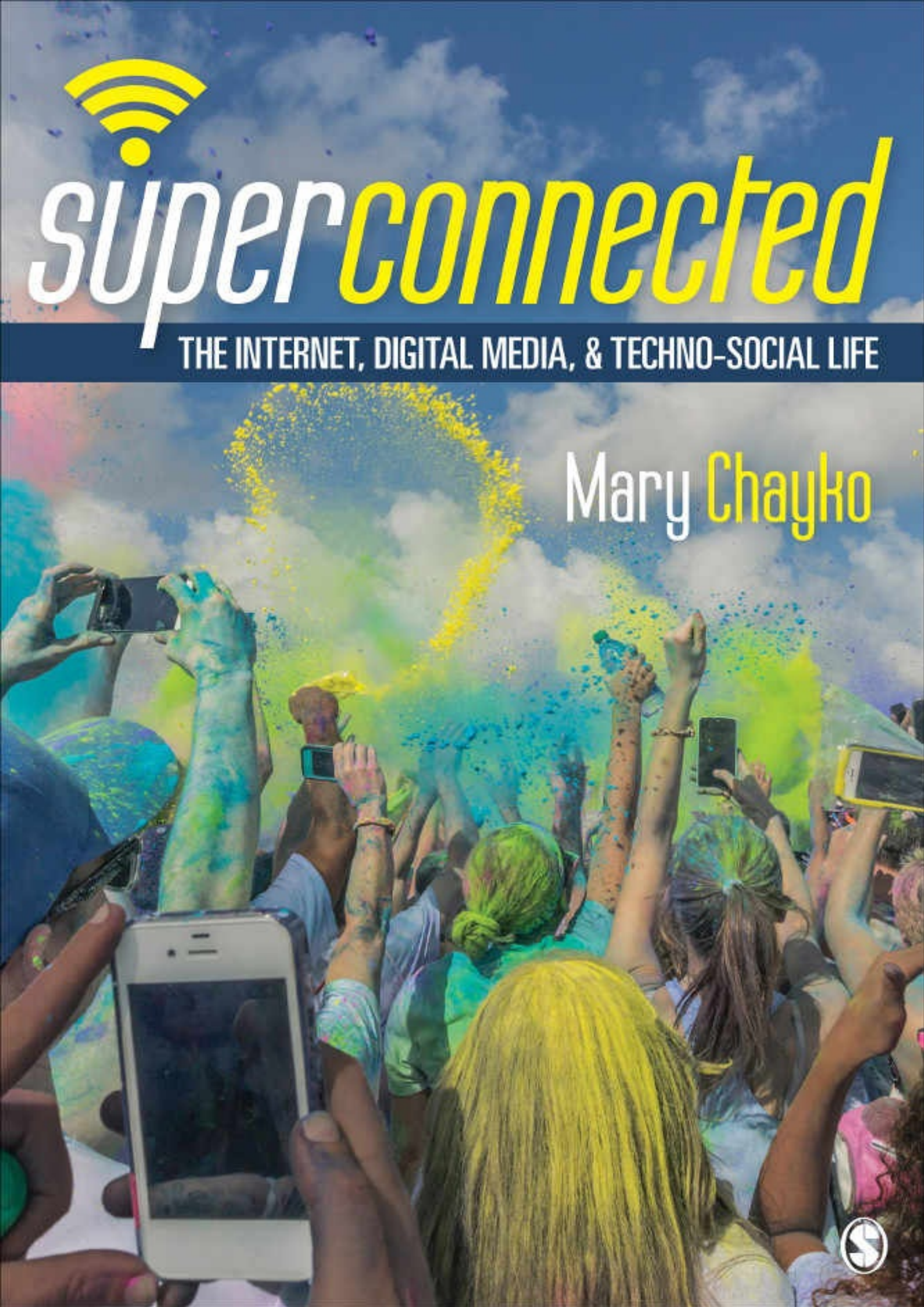
superconnected

THE INTERNET, DIGITAL MEDIA, & TECHNO-SOCIAL LIFE

Mary Chayko



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2 Creating the Internet Age

A (Very) Short History of Information and Communication Technology

Communication is much more than an act of technological mediation, or even a process of writing or talking. Communication is prehistoric, preliterate, preverbal, and even nonverbal—think of how much is communicated by body language. Prior to the invention of words and writing, people sent messages to one another using gestures, grunts, cries, and crude symbols like cave paintings, stone carvings, and smoke signals. Then, as now, these messages were probably imperfectly received and interpreted, but they speak to the timeless human desire to communicate with one another, to be seen and known and understood.

In prehistoric times, before records of these processes could be kept, communication consisted primarily of gestures, grunts, and body language. Slowly, communication became verbal and more complex; grunts became words and words became spoken languages. Formal languages began to coalesce and spread, probably between 150,000 and 350,000 years ago, though it could have been even earlier—it is extremely difficult to pinpoint with accuracy things that happened before written records were kept (Perreault & Mathew, 2012). Famed communication theorist Marshall McLuhan has compared language to transportation technology, invoking French philosopher Henri Bergson in writing that "language does for intelligence what the wheel does for the feet and the body." Language enables the intellect to "move from thing to thing," McLuhan said, and allows people's thoughts and ideas to be transmitted and to be more easily shared (McLuhan, 1964, p. 83; see Chayko, 2002).

When languages began to take root, people could share information with one another more widely but also more concretely. At first, they'd share easily memorizable facts, such as lists of kings or names of clans, that they thought important to pass along to future generations. When they did so, those facts could become fixed in people's minds and in the collective memory of the group. It would then become more important for future group members to know such facts—and knowing them would become part of their role and identity as group members. Sharing information in this way became part of how people related to one another and helped connect them to one another.

Somewhere around 5,000 to 8,000 years ago, in Mesopotamia, China, or Egypt, formal systems of writing began to appear, originally simply to keep count of things and record business transactions. Technology external to the body, such as bones and shells dipped in plant juice or animal blood, recorded information on available surfaces (Gabrial, 2008). Phonetic elements and alphabets emerged as well. This allowed people to communicate with even greater specificity and breadth. People were freed from having to retain everything they knew in their minds; now that they were able to write much of it down and pass it along, messages could be more complex, more abstract, and could have greater longevity. People who lived at different points in time could learn in greater detail about those who had come before them. It became possible to form detailed, complex social connections that would span time and space (see Chayko, 2008, pp. 10–13).

Words and symbols were etched into stone and clay and then later printed on parchment, cloth, and paper with styluses and ink. These early forms of media (software, really!)

allowed data and messages to be stored and communicated to others. Hand-printed and copied scrolls, books, pamphlets, and newspapers—the first mass media, intended to reach larger audiences—followed. These documents were painstakingly prepared and copied by hand until the invention of movable type, in which molds of original pages were cast in a material such as clay, wood, or, most durably, metal, allowing them to be printed and reprinted.

In or around 1450, Johannes Gutenberg introduced a mechanical movable type machine called a printing press and ushered in the era of mass production and communication. Books, including the Bible, could now be mass-produced—indeed they could become bestsellers. The technology quickly caught on; within fifty years, tens of millions of copies of books had been printed. Pamphlets, newspapers, and magazines soon became set in movable type as well. The mass-media era was now swiftly underway, ushering in a time of rapid social change, as political movements (like the American Revolution), social movements (civil, labor, and women's rights), and the beginnings of public education all gathered large-scale strength with the ability to disseminate ideas and information widely. Since this time, ICTs have helped bring about social changes small and large and have, in fact, become indispensable to such causes, as we discuss further in Chapter 5.

In the early 1800s, technologies that allowed the harnessing of electric power, such as electromagnetism and batteries, became sufficiently advanced that practical applications of electricity followed. These applications included many that facilitated the sending of messages electronically, such as the phonograph (which was originally acoustic), telegraph, telephone, and the mass media of film and radio. Messages could now move much more quickly from one place to another. The 1900s brought improvements on the prior century's innovations, plus television, videophones (oddly, a very early invention that never really caught on until the era of the webcam), computers, and giant brick-sized early model cellular phones (which did not have computerized capability beyond telephony and are discussed later in this chapter, along with mobility in digital communication). Interestingly, as new technologies are invented, they do not necessarily supplant those that came before but are often used in combination with them, sometimes inspiring changes in how the existing technologies operate or are used (see Dunbar-Hester, 2014; Jenkins, 2006; Volti, 2014).

By the 1900s, data could be stored and shared so widely, in so many ways, that the word *media* had many meanings. It could be defined by the type of platform used to deliver it (broadcast, print, digital, mobile, social/interactive, multimedia), its content (news media, advertising media), or its recency (traditional media, new media). To speak of *the media* is generally to reference the totality of all these types of media. And one of the newest and most important of the media that could reach many people nearly instantly—the internet—was on the horizon.

A (not quite as) Short History of Computing and the Internet

The forerunners of modern computers actually date back thousands of years, when people began to develop nonmechanized (and later mechanized) means to count and calculate sums and to automate very basic functions. The first known use of the word *computer* actually referred to an individual who, in the early 1600s, was considered extremely adept at arithmetic and talented at computing. Such a person would be called a "computer" for short. Now, of course, when we think of *computers*, we think of machines that are programmable, perform complicated tasks, use digital encoding, and can be linked to other computers so that information can be transferred from one to the other.

Computers became more modern and began to fit this vision throughout the mid to late 1800s and into the early 1900s. Notable advances were made by Charles Babbage, who in 1837 designed the first programmable mechanical computer; Ada Lovelace, considered to be the first computer programmer (1840s); Herman Hollerith, who in the 1880s invented the keypunch machine that launched information processing; and Alan Turing, who in 1936 designed the first electronic digital computer.

Many consider the modern age of computing to have begun in the 1930s and 1940s. Engineer and mathematician Vannevar Bush began thinking about how machines could automate human thinking, and, in 1931, built a huge, almost room-sized machine called a differential analyzer that could analyze differential equations. In 1945, a landmark article he wrote and published in the *Atlantic Monthly* magazine titled "As We May Think" described how a machine called a memex might extend human memory by making links between documents (presaging computerized hyperlinking), allowing a person to build "a trail of many items," occasionally inserting "a comment of his own, either linking it into the main trail or joining it by a side trail to a particular item" (Bush, 1945). Bush's work was constrained by the level of technology of the time, and he died before the web and hyperlinking were invented, but his ideas directly inspired those who actually built the internet and the web.

In the 1950s, a number of computer scientists, psychologists, physicists, and other scholars began to imagine and develop interactive computers of the type that the internet would use. Some, led by computer scientist John McCarthy, concentrated on the development of *artificial intelligence*, or computing systems able to perform tasks that would otherwise require human intelligence, such as visual perception, speech recognition, and decision making. McCarthy and his colleagues conducted research into *artificial intelligence* that led to the development of computers that could best human beings in games like checkers and chess and solve problems of logic. The U.S. Department of Defense funded much of this research, clearly committing to the importance of "smart machines." In 1954, American inventor George Devol laid the foundation for the field of robotics with the first digitally operated and programmed robot, named Unimate, which worked on a New Jersey assembly line. An extension of artificial intelligence, *robots*, guided by computer programs, would take on rote tasks that could be automated, but they would also, as we shall see, take on more complex tasks over time and become more lifelike.

At the same time, other researchers, such as psychologist J. C. R. Licklider, realized a particular need for the development of computers that could perform the more mundane steps of multistep tasks. He envisioned a human-computer partnership, or symbiosis, that would feature a “very close coupling between the human and the electronic members of the partnership” (Licklider, 1960, p. 4). Licklider described all kinds of possible uses for computerization, including digital libraries, e-commerce, and online banking, and he also envisioned a point-and-click system for using the computer.

Licklider’s fellow pioneers into interactive computing began to develop the technologies needed for networked computing to become reality. Doug Englebart, who was strongly influenced by Vannevar Bush, set forth a vision for a human intellect augmented by computers and then created a research lab at which the technology for hyperlinking and the computer mouse was developed. A method by which blocks of data could be transmitted, called packet switching, was developed, independently, by Paul Baran in the United States and Donald Davies in the United Kingdom. Computer hardware, software, and the programming codes that would instruct computers what to do became increasingly more sophisticated. Protocols for connecting computers together, network standards, and assigned domains began to spring up. Conditions were ripe for an internet to be born.

What we now think of as the internet actually began as an initiative of a Department of Defense agency responsible for the development of technology for military use. It is called the Defense Advanced Research Project Agency, or DARPA. A computer research team at DARPA, including Licklider, Baran, Leonard Kleinrock, and project manager Larry Roberts, all of the Massachusetts Institute of Technology (MIT), began to invent and test out various models. Similar research was also underway at RAND, the global nonprofit research and development organization that conducts military and weapons research, and at the United Kingdom’s National Physical Laboratory (NPL), where Donald Davies worked. In 1965, working with Thomas Merrill, Roberts connected a computer in Massachusetts to a computer in California with a low-speed, dial-up telephone line, creating the first wide-area (though tiny by today’s standards) computer network. Roberts called this idea of networked computers the ARPANET (Leiner et al., 2009).

Several academic institutions soon became keenly interested in this project. ARPANET computer sites were set up at University of California, Los Angeles; University of California, Santa Barbara; the University of Utah; and the Stanford Research Institute. Paul Baran argued strenuously and ultimately successfully that the internet’s nodes, or annex points, should not feed directly to a single centralized source but be distributed so that the whole network would not collapse if one portion of it were to fail, and so that it could not be taken out all at once in an enemy attack. Coordinated activity among these sites—mostly the sharing of resources and performance of mathematical functions—began in 1969, and in 1970 additional computers were added to the network. The system was successfully introduced to the public and demonstrated by Robert Kahn at the International Computer Communication Conference in 1972.

ARPANET evolved into what we know as the internet, as research continued not only into the means of connecting and networking dispersed computers but into the possible uses of such a network. Interested researchers, business professionals, and government and military users began utilizing these computers to share information with one another. An

initiative called BITNET attempted to link all academic mainframe computers. In 1974, the term *internet* (short for *internetwork*) was first mentioned in a document on transmission protocols by Vinton Cerf, Yogen Dala, and Carl Sunshine (1974). And before long, it would become obvious that one of the internet's most enticing uses would be neither military nor academic, nor even particularly industrial, but *social.*

Now that the ARPANET was up and running, applications could be developed, and almost immediately a platform people could use to interact was developed. In 1972, Ray Tomlinson, a defense department engineer, sent the first email message (he has since forgotten its contents, he says!) and made the highly influential decision that the @ symbol would be used as the electronic locater symbol. Larry Roberts wrote an email utility program, and almost immediately people began creating mailing lists, allowing groups of people with similar interests, such as science fiction devotees or wine tasters, to share information and engage in discussions. "We could see instantly that email was a *social medium*, in addition to simply being an interoffice memo system," recalls Vinton Cerf (as cited in Standage, 2013, p. 219, emphasis added). The simple but powerful ability to exchange messages electronically quickly became one of the most popular uses of the internet, eventually becoming an everyday activity for billions of people (see Rainie & Wellman, 2012).

Experimentation into other kinds of applications, such as gaming, file sharing, and voice communication, began. Some early group messaging and bulletin board systems existed (see social networking and social media, discussed later), but relatively few people thought to or were able to use them. Computers themselves were not common and neither were the slow, sometimes expensive dial-up connections that were required to connect them to other computers and networks of computers. Few had the specialized knowledge needed to operate them, for graphical, "windows-like" modes of network navigation (like point-and-click interfaces) had not yet been invented.

Still, small local computer networks (LANs) sprang up, and throughout the 1970s larger ones appeared. Some researchers, business professionals, and members of government and military organizations began using these computers and the young internet to share information with one another. At the same time, computers were coming down in size and in price. The invention of the microprocessor—a small chip that contained most of a computer's circuitry—allowed computers first to fit on the top of a desk, and then, years later, in one's hand.

In 1973, IBM and Hewlett-Packard introduced the first of these desk-sized programmable computers. These were mostly used for scientific and research purposes. Other early personal computers were introduced by Xerox, Commodore, Radio Shack, and, perhaps most famously, by Steve Jobs and Steve Wozniak, who created the first Apple computers in 1976 in Jobs's family garage. During this time, Microsoft founders Paul Allen and Bill Gates began to develop an operating system to allow computers to interpret and execute their coded instructions. By the late 1970s, early adopters were purchasing personal computers and these computers were becoming successfully marketed, although their uses were still quite limited.

In the late 1970s, a packet switching system called X.25 began to spread internationally, and a worldwide network infrastructure was spawned that reached from the United States

and Europe to Canada, Hong Kong, and Australia. By 1982, protocols by which data could be transmitted and received (called TCP, Transmission Control Protocol, and IP, Internet Protocol) were standardized, and the resultant worldwide network of interconnected networks became widely referred to as “the Internet” (always with a capital *I* back then; it was also sometimes called the information superhighway). In 1985, The National Science Foundation Network funded five large, interconnected supercomputing centers that would become connected to regional networks and to colleges and universities, along with the equipment and circuits needed to facilitate connection to this network. This sprawling network (or network of networks), called NSFNET, became considered the “backbone” of the modern internet (Cyber Telecom, 2014).

Though the internet as we know it today was taking definite shape, still only about 10% of Americans in 1983 owned personal computers, and only about 10% of those people—approximately 1.4% of the U.S. population—were using the internet to send and receive messages (Rainie & Wellman, 2012, p. 60). The applications and uses of computers were still not apparent, and their operation was slow and cumbersome. There was also a big structural obstacle: The National Science Foundation’s acceptable use policy forbade *any* personal or commercial use of the NSFNET “backbone” network (although smaller connecting networks could formulate their own policies). The larger network, the internet itself, was supposed to support research, education, and nonprofit firms only. But before long, this policy was challenged. The internet would not be contained.

In 1990, one of the regional networks connected to the internet, a Michigan network called MERIT, proposed to the National Science Foundation that the commercial potential of the internet be explored. A for-profit corporation was permitted to develop and own computers and transmission lines and solicit customers. Though this development was not without controversy (indeed, congressional hearings regarding the appropriate future of the internet were held), commercial internet service providers were eventually allowed to become part of the quickly expanding network, whose infrastructure and services were now being frequently updated. Communications-based corporations like Sprint, AT&T, IBM, and MCI helped fund and establish the needed technology to expand and privatize the internet. CompuServe (1979), Prodigy (1984), and America Online (AOL; 1985) began offering service packages and the means for people to “get onto” the internet, and Microsoft began developing and providing browsers and servers in addition to its operating system. In 1995, the National Science Foundation ended its sponsorship of the project and the internet could be considered privatized (Harris & Gerich, 1996).

Although private companies began to become involved as vendors or service providers, there was no central or global agency controlling the internet—not the Department of Defense, not a research think tank, not a university. Crucial to the successful development and identity of the internet was its open and distributed architecture. Openness, of course, has its benefits and its drawbacks. Malicious programs written and programmed to disrupt the operation of computers and networks, called *computer viruses,* began to be written and deployed. Malicious code called *malware* could spread rapidly from computer to computer, erasing hard drives, stealing data, or monopolizing the screen with a graphic that would not go away. Junk email, or *spam,* that could potentially damage a computer could be sent simultaneously to countless accounts (Naughton, 2012). In time, malware- and spam-blocking services and filters became sophisticated enough to derail a good

portion of these problems, but, as we shall see in Chapter 4, hacking and computer crimes now proliferate.

Still, the openness of the internet, considered critical to its functioning and social applications and central to its very identity, was preserved through each iteration and innovation that allowed it to expand. Each link in the network could stand on its own; the larger network did not rely on any one portion for it to work. When a “web” of services and applications began to diffuse across the still relatively young internet, its impact was immediate and profound.[1]

The Web is Born

As recently as 1990, the internet was still a relatively small-scale phenomenon. There were probably fewer than 5 million internet users worldwide. “Only people with specialized knowledge could find what later came to be called ‘web sites,’” Rainie and Wellman have pointed out, “and only real specialists could build them” (2012, p. 61). Though the internet was technically open for business, it was difficult to navigate and work within, and so its *affordances*—its possible opportunities, effects, and benefits—were still largely unknown. The internet was still strange, incomprehensible territory.

All this changed with the development of the World Wide Web (WWW) during the 1989–1991 time frame. The WWW was the brainchild of Tim Berners-Lee, a British engineer who worked for the European Organization for Nuclear Research (called CERN) and who had begun developing what he called the “WorldWideWeb”—originally all one word. It was, and still is, a collection of documents that are linked together through a system called *hypertext*, which had been invented without a context for widespread usage by American engineer Doug Engelbart and his team at the Augmented Research Center back in the 1960s. Hypertext contains *hyperlinks* that allow the user to click easily and nonlinerally from one bit of data to another and has become a central feature of internet use. By ensuring that documents could be embedded with hypertext links that would take users anywhere on the web, Berners-Lee saw to it that one portion or branch of the web would not be able to dominate or overtake the entire system. Documents could be linked and interlinked in a sprawling, weblike structure, hence the name—which soon became abbreviated to “the web.”

Just as important as Berners-Lee’s technical and intellectual contributions to the web and the internet was his determination (and that of CERN) that the web be decentralized and available for free for anyone to use. In 1993, CERN made web technology available to the world at no cost to any particular organization—a key moment in internet history that meant that unfettered access to it would be the web’s most striking and enticing feature. Aided by the internet’s open architecture, this would herald the web’s worldwide (though not universal) spread and influence. The Telecommunications Act of 1996 called for all U.S. classrooms, libraries, and hospitals to become connected to the internet. Thanks to the invention of email and data transfer technologies (including files, chats, phone calls, and streaming video), the web became a place where people began to congregate, to reach out to one another, to be social, and, eventually, to build networks and share media.

Technologies that supported the widespread development of the web were rather quickly invented and enjoyed rapid adoption and diffusion among computer users. Mosaic, a web browser that was graphical and easy to use, supplanted the clumsier text-based browser Gopher in 1993 and was soon followed by the even easier to use graphical Netscape Navigator. Now, people could travel or “surf” the web without possessing specialized knowledge and skill. Web pages became visually interesting entities—simpler versions of what they are today, but much more colorful and refined than the earliest versions. The Digital Millennium Copyright Act (or DMCA) of 1998 governed the use of copyrighted content in the United States, shielding websites from liability for users’ possible copyright infringement (though contested content had to, and must still be, taken down temporarily). Web directories, such as Yahoo, began to catalogue things on the web. Early versions of

web-based commerce and banking were offered.

Search engines, which provided a means for people to find what they were looking for on the web, soon followed, but they were not immediately seen as critical tools. The internet was envisioned as "an infrastructure of connection, not of sorting or of organization," Christian Sandvig has noted. "To the typical Internet user of that era, computers did not usually sort content in any way that was meaningful. They did not sort (recommend) music or movies, email was not automatically highlighted as 'important' or 'spam,' and search engines were not particularly useful" (2015). In fact, the success of AltaVista, the first important search engine, launched in 1994 following earlier engines WebCrawler and Lycos, was not foreseen. The prevailing belief was that it was not possible or necessary to efficiently sort and catalogue the web (Sandvig, 2015).

Google, developed by Stanford Ph.D. students Larry Page and Sergey Brin in the mid 1990s, became available to the public in late 1997 and took web searching to the next level. Rather than ranking search results by the appearance of the desired search term, Google determined a website's relevance by the number of pages that linked to it (the PageRank system). In 2001, Google revolutionized the process of web searching again by developing complex, rule-based formulas, or *algorithms,* that sorted and organized information even more efficiently. Over time, these algorithms became progressively more sophisticated, allowing searches to become personalized in order to supply you—the searcher—with links that would be of greatest interest to you (and learning quite a bit about you in the process—we explore the implications of this in Chapter 4).

These innovations paved the way for the development of increasingly interactive software, media platforms, and specialized programs called applications or *apps.* People with special interests from a wide range of backgrounds began to create the intricate and sophisticated web pages, sites, and blogs that now populate so much of the web. The imagination of many was caught with this stream of innovation, and ways to create content and associated technologies became more apparent, available, achievable, and inexpensive. The shaping of the internet by people without technical expertise was underway.

However, the internet was still not, and is still not, universally accessible. The technology that would facilitate internet connectivity began to penetrate Europe in the mid-1980s, Asia in the late 1980s, and Africa in the 1990s. Still, as noted in Chapter 1, only about 40% of the world's population uses the internet today (ICT, 2014; McKinsey and Company, 2014). In many areas of the globe, the electronic (and physical) infrastructure is still underdeveloped or too expensive for all but the richest citizens to access. Furthermore, authoritarian or totalitarian regimes may censor or filter the internet, denying people the ability to freely access and disseminate information. Mobile phone communication, however, is spreading more widely, even in developing areas of the world, providing many individuals with internet access they would otherwise not be able to obtain (we discuss global impacts and inequalities, and the implications of these inequalities, in Chapter 5).[2]

Wireless and Mobile Communication

One of the biggest advancements in information and communication technology, and in digital technology in particular, has been the development of the ability to communicate wirelessly. By making the mediated world and all that it offers portable—accessible nearly anywhere and at any time—wireless and mobile technologies have become an essential component of life in modern societies and in many ways characterize these societies. Though we think of mobile (or cell, and now smart) phones as the first and most important of these technologies, they were preceded by many innovations that allowed individuals to move farther and farther away from one another in physical space and to still establish and maintain social connections "on the go." These innovations include roads, railroads, cars, planes, stone tablets, pen and ink, books and newspapers, transistor radios, and handheld cameras, all of which help make portable communication possible. The continuous invention of ever-smaller, ever-more-portable devices with which we can communicate reflects the desire of many modern individuals to access information and enjoy social connectedness while on the move.

Wireless communication dates back to the late 1800s, when electromagnetic waves, which make wireless connecting possible, were discovered. Radio waves were used for electronic transmissions via two-way radios, such as citizen band (CB) radios, and for the sending of telegrams. Later came radio and TV shows and global positioning systems (GPS), used to determine location in cars, boats, and aircraft. As of the mid-20th century, cellular, satellite, and other wireless networks became the foundation for modern mobile telephony, computer connectivity, Wi-Fi, and wireless broadband internet.

Mobile phone technology first appeared in the form of car phones, which made their debut appearance in 1946. They were enormous and expensive and, of course, limited by the technology of the time. Though they were mobile, they couldn't utilize the cellular and transistor technology that had yet to be invented and perfected, and so calls were more like CB radio transmissions in which one person had to wait for the other to finish talking before continuing the conversation. Others could easily listen in. The earliest phones were the size of a suitcase, and "the only call one could make would be to the service station, as the power required to make a call actually killed the car battery" (Dead Media Archive, 2011).

Motorola led the development of the modern mobile cell phone that was not anchored to a car. Engineer Martin Cooper made the first mobile phone call in 1973 in New York City. The phone weighed almost two and a half pounds, and its battery lifetime was only 20 minutes, but that wasn't too much of a problem, Cooper has been quoted as saying, "because you couldn't hold up the phone that long" (John Dixon Technology, 2012b).

It took until the 1990s for enough radio frequencies to be assigned that mobile phones could become a viable mass technology, and even longer for the size and price of phones to come down so that they could enjoy wide acceptance. Not until the 2000s did phones become truly "smart"—able to serve as mini-entertainment and information centers, with text messaging and web browsing as standard features. Four "generations" of mobile phone technology (called 1G, 2G, 3G, and 4G—introduced approximately 10 years apart) have been designated to mark differences in the capabilities of these phones.

Improvements have included the ability to transfer calls from one cell site to the next as the user traveled between sites during a conversation (in the first generation, 1G, introduced in 1981) and the replacement of this kind of circuit switching by the internet's packet switching technology, which enabled a higher density of streaming audio, video, and phone calls (4G, in 2012).

But enabling phone conversations is no longer the primary purpose of a smartphone. In the late 2000s, cell phones and smartphones began tofeature full keyboards rather than just embedding letters within number keypads, and wireless data price plans began to come down in price, both of which enabled text messaging to become a mainstream activity. *Texting* was, and is, a relatively simple, convenient, and unobtrustive way to communicate. It can be done silently in the midst of any number of activities and environments, often without others aware that it is happening. Texting is such a convenient and efficient way to communicate that it allows, for many, near-constant interpersonal connectedness (a state that we examine further in Chapter 9).

The proportion of the American population that texts has risen dramatically in recent years, while using cell phones for voice conversations has decreased just as dramatically. From 2006 to 2011, the percentage of the adult American population that texted nearly doubled, rising from 31% to 59%, and this number continues to increase (Rainie & Wellman, 2012). Over 75% of American teenagers text, with older teens sending an average of over 100 texts a day (Lenhart, 2012). As modern smartphones are really mini-computers that include cameras, word processing capabilities, internet access, and numerous apps, one wonders whether mobile "phones" may eventually be called something else.

Mobile phones have now diffused across the globe, reaching even into traditionally poor, rural, or low-population areas that might not otherwise be able to utilize the technology, although in such areas people are much more likely to use a rudimentary phone that may not be able to access the internet, and it is not uncommon for several people to share a phone. (For more on global digital communication, see Chapter 5.) Many mobile web users rarely or never use a desktop, laptop, or tablet to access the web. Advancements in mobile tech and the technology of *virtual reality*, or immersive nonphysical environments that simulate the physical, have also brought about a huge increase in games and gaming that are enjoyed on mobile devices (John Dixon Technology, 2012a).

Early Online Networking

A bunch of individuals (or groups, or organizations) can be said to be *networked* when they are connected or tied together such that they have some relationship to and influence over one another. To consider entities networked is to be able to trace and chart the many ways, some subtle and some even invisible, that this occurs.

Online social networking is often described as one of the most recent applications of the internet and the web, but it actually predates both. The first computerized interpersonal social networks arrived in the mid-1970s. They had great historical significance in terms of facilitating the exchange of messages among physically separated people, and there was an incredible sense of excitement that accompanied their use in those early years. The feeling of being part of a grand social experiment—a pioneer on a brand new frontier—was frequently invoked among those developing this new kind of social interaction in those not-so-distant times. They seemed to sense, correctly, that they were at the vanguard of a revolutionary form of sociality.

Many consider Murray Turoff to be the "father" of social, interactive computing. In his work in the early 1970s, first for the government and then as a professor at New Jersey Institute of Technology, he designed several initiatives that allowed dispersed individuals to share information via computer. Perhaps the most well known of these (developed with Starr Roxanne Hiltz, also a professor at NJIT and Turoff's spouse) was a teleconferencing system called the Electronic Information Exchange System (EIES), which included very early versions of online educational courses. Interestingly, it also encouraged face-to-face meetings among its users. Many who designed the online networks that followed EIES have mentioned how influential this early online initiative was in their conception of what it might mean to be digitally connected and networked.

One way that people could be networked online was via a system whereby someone would electronically post a message and someone else could respond. At first, this exchange had to be asynchronous—in fact, in these early days, it could take days or even weeks for a response to appear! Some very early 1970s experiments that allowed the exchange of messages included Community Memory, which used hardwired terminals in various neighborhoods near Berkeley, California, to allow people to submit and respond to questions; PLATO, developed at the University of Illinois, which allowed people to share "notes" (at first education-oriented), play games, chat, network, and eventually spread these messages around the world; and the Computerized Bulletin Board System, which originated in 1978 in Chicago, Ilinois, and was intended from the start to be accessible to the larger public through dial-up access. Thereafter, post-and-response setups were often called bulletin board systems, or BBSs, and, eventually, simply message or discussion boards or forums.

Online gaming was born and gained steady popularity in the 1970s as well. Some games were adventure based and encouraged their players to create what have been called virtual "worlds" together. These games were and are called MUDs (multiuser domains), MOOs (multiuser object-oriented domains), or MPORGS (multiplayer online role-playing games). In them, large numbers of users cocreate meaningful domains or environments in which they interact, play games, and form relationships, including romantic and

cybersexual relationships. Players depend on one another to create and inhabit the game space or "world."

Prior to the development of graphical interfaces, these worlds were text-based only and did not feature images or avatars. Still, they gave the player the sense that he or she was in a multidimensional environment. The sprawling, cocreated environment provided a "place" for people to not only play the game but to get to know one another as well, which was (and is) a critical aspect of the gaming experience. Rudimentary graphics and a host of interactive games (such as Dungeons and Dragons in 1974) and "worlds" (such as The Sims, a "life experience" video game in 2000) followed. Participants felt truly immersed in social interactivity and sometimes in virtual reality experiences that felt—and, indeed, were—very real.

Very early entrants into the world of social networking were usually "techies"—people with above-average interest in computing or gaming (or they wouldn't have had knowledge of and access to the still-rare computerized technology in the first place). They needed patience to deal with extremely slow data transfers and waiting time for responses and were both curious and interested in connecting in this brand new way. These persistent early adopters and users gave this new experience, this new techno-social activity, a chance to take off and grow.

In 1980, a somewhat different way for people to share and discuss articles and posts was invented by Tom Truscott and Jim Ellis at Duke University. Called Usenet, it was originally intended only for the use of those at Duke and at the University of North Carolina. It used the ARPANET rather than the internet. Usenet had no single central authority or server. It was, instead, a sprawling, decentralized way for groups of people interested in different topics to find one another in text-based, categorized newsgroups; to post and retrieve articles and messages; and to discuss these communications in a free and uncensored way (as it had no central authority that could censor it, though newsgroups were moderated). It spread fairly widely fairly quickly. Unfortunately, due to its open and uncensored nature, an unfettered spread of pirated and illegal material and pornography throughout the system eventually threatened its position as the premier online social network. That, plus competition from the discussion groups and forums beginning to proliferate on the internet, many of which were characterized by graphical interfaces that were easier to use, spelled the downfall of Usenet. Usenet eventually moved to the internet and become so decentralized that it couldn't be simply shut down all at once. In fact, it still exists, though it can not claim any kind of dominance as a social network. A whisper of its former self, as of 2010, Usenet was no longer even operational at Duke University.

In 1984, physician Larry Brilliant convinced Stewart Brand, publisher of the liberal magazine *Whole Earth Review*, to join forces to create a unique online social network that would be part community and part business. Brilliant's idea was simple (and brilliant?): "Take a group of interesting people, give them the means to stay in continuous communication with one another, stand back, and see what happens" (Hafner, 2004). This experiment would pay off big; appropriately named the WELL (Whole Earth 'Lectronic Link), it resulted in a quirky, unique social network characterized by intense exchanges among members, many of whom shared their lives with one another in great depth and provided all kinds of support to one another, including, at times, the sending of money and

the initiation of face-to-face meetings. The WELL would influence nearly every form of social networking that followed, including an early online community for college students called Tripod (established in 1992) and GeoCities (1994), a site which allowed users to create websites modeled after urban areas.

Throughout the 1980s and 1990s, the WELL grew in size and scope, and the spirit of the WELL—the idea that the internet could be highly social—began to permeate the common consciousness. In 1994 and 1995, the *wiki*—a web application in which groups of people could collaboratively build and edit documents and sites online, even in real time if they liked—was invented. AOL's Instant Messenger (AIM; founded in 1997), which allowed participants to chat with one another in real time, was becoming extremely popular. Blackboard (also founded in 1997), an educational course management system, provided a structured means for teaching and learning to occur online. And blogging had begun to make the web a kind of personal, albeit public, space for expression.

The very first blog, though it was not yet so named, is generally credited to Swarthmore student Justin Hall, who began posting online about his life in 1994 at links.net (which, as of this writing, is still in active operation; see Hall, 2014, and Silleson, 2014). Such sites, soon to be called weblogs (for they "logged the web"), and later known as just blogs, consisted of collections of links, diary-like musings and confessionals, information dissemination, or some combination of these. Beginning in 1999, the platform Blogger provided individuals with a simple way to create and share blogs, thus helping to popularize the practice. As the internet was still not widely understood, many wondered why anyone would choose to share private thoughts and feelings online. Indeed, in 2002, blogger Heather Armstrong was fired for complaining online about her job as a web designer and graphic artist, an early example of the potential pernicious consequences of online sharing. Still, within a few years of the birth of Blogger and other blogging and journaling sites like Xanga and LiveJournal, blogging had become widely accepted, and by 2006 more than 40 million blogs had been published on the internet (Standage, 2013, p. 228).

The birth of Wikipedia came in 2001, and wikis and collaborative practices, such as video, audio, and text conferencing, continued growing. Wikipedia is an extensive expression of the gathering of large amounts of information in an easy-to-access place. It is similar to an encyclopedia (from which its name is partly derived), but it is continually updated by the over 20 million users (or "editors") who contribute to it (most of whom are males with tech skills; see Hargittai & Shaw, 2015). It began as a supplement to and later replacement for the more professionally edited online encyclopedia Nupedia. Wikipedia is also notable for using *open source* software which means that its content is freely distributable and reproducible. Such a system can compromise reliability and safety for openness, but those who oversee Wikipedia attempt to minimize inaccuracies, providing oversight of entries and requesting additional information when needed, and the accuracy of entries ideally improves over time. It is not a foolproof system, nor is it a gold-standard tool for research, but when used with a critical eye it can be an excellent starting point for the exploration of a topic. It also, at this writing, has no corporate biases, as it does not accept advertising and claims that it never will.

These early networking systems were significant not only because the technology that

would connect people online was proving to work but, very importantly, because of the strong and *real* sense of community that was invariably the by-product whenever they were established. Those who communicated via these online networks very often came to feel bonded—like members of a community or club in which they were genuinely, often deeply, engaged. It was, for sure, a new way to initiate sociality. Early pioneers on what John Perry Barlow called the "electronic frontier" were showing everyone else that time spent online could come to have a social, communal quality that was real and meaningful (Goldsmith & Wu, 2006, p. 17). Soon, this quality would practically be synonymous with the internet.[3]

Full-Featured Social Network Sites (SNSs) and Social Media

In the very late 1990s and around the turn of the 21st century, a number of sites sprang up that were sufficiently different from earlier experiments that they began to be known by the specialized name *social network sites* (SNSs) (boyd & Ellison, 2007). These sites were different from those that preceded them in that their users could easily see and articulate lists and profiles of "friends" and "followers." These friends and followers were typically people that they already knew, or knew of, personally. Members on SNSs also had the capability to create profile pages, substantially personalizing their use of the site. Compared to sites that had existed in the past, they were generally easier to use and became more and more user-friendly over time.

These sites also differed from those that came before in their scale. They could serve the one-to-one or one-to-many functions of communication equally smoothly, giving them both a personal and a "mass-media" feel and function. Material on these sites could generally be easily shared and reposted, and information and profiles could be accessed by search engines. SNSs are sometimes called new media, but their social functions are so profound and prominent that the moniker that has really stuck is *social media*, especially for those platforms with obvious media-sharing capability.

The first site generally considered to provide all these functions, and therefore to be the first full-featured SNS, may have been 1997's Six Degrees. Though AIM featured buddy lists, members of Classmates.com could affiliate with their high schools or colleges and search for people to connect to, and some early dating and community sites allowed the creation and posting of profiles, Six Degrees was the first to combine all these features. It was also, perhaps, a bit too "ahead of its time" (boyd & Ellison, 2007). While it attracted millions of users, they were so widely geographically dispersed that good-sized networks of people who knew one another face-to-face failed to form. One of the first truisms of online social networking began to become apparent: People mostly use online social networks to maintain and enhance connections with people they also know face-to-face.

The next widely used SNSs were organized around journaling (LiveJournal), community interests (AsianAvenue, BlackPlanet), business (Ryze), and virtual worlds (Cyworld). In 2002, Friendster was launched; this SNS had the explicit goal of helping friends of friends (and friends of friends of friends, and so on) come into contact and possibly meet. Friendster's rapid growth created problems both technically and culturally as the company struggled with how to keep up with facilitating the functions users seemed to most want, and users became disenchanted. Interestingly, just as Friendster's popularity was fading in the United States, it took off in the Phillipines, Singapore, Malaysia, and Indonesia. Its success, for a time, helped convince many groups to launch their own SNSs, and from about 2003 or so there was an explosion of such sites (notably LinkedIn, Tribe.net, and MyChurch).

Social network sites were also becoming organized around the sharing of media. Before long, media-sharing sites like Flickr (photo sharing) and YouTube (video sharing) added social networking features to their sites and became full-fledged SNSs and true social media sites. Today, social media and social networking are in many ways synonymous, since most SNSs allow (indeed encourage) both media sharing and networking and users

often perform these activities together. MySpace, which launched in 2003 as a full-service SNS, was particularly welcoming to music and bands. People began connecting with others based on their musical preferences and all kinds of other shared interests. The most popular SNS of its time, MySpace grew in size as its members (increasingly teenagers) encouraged their friends to join. In time, it was sold to a corporation and implicated in several underage sex crimes and scandals; it subsequently lost much of its status as a top SNS.

The decline of MySpace coincided with the rise of Facebook (initially, "thefacebook"), which would eventually become the world's largest and most influential SNS. Established in 2004 as a Harvard-only site by Mark Zuckerberg, assisted by other Harvard students, it spread to other colleges and high schools in 2005 and to professionals and then the wider world beginning in 2006. As of this writing, it is by far the most populated and well-known SNS, with about 1.25 billion users and over three-quarters of a billion daily users (Sedghi, 2014). Some, however, feel that its growth has come at the expense of the intimacy and "coolness" that characterized the early Facebook.

Decisions by Facebook to commercialize the site with advertising, embed its "like" buttons throughout the internet, and allow numerous applications to become activated and used in conjunction with the site in what has been called "frictionless sharing" have been criticized as eroding intimacy and community at the expense of monetization. Facebook develops and uses algorithms that help determine much about who its users are and how to best reach them and encourage them to become more deeply engaged in the site. Then it begins to make money from (*monetize*) their participation—usually through the gathering and selling of their data (see Chapter 4 for more on data mining). Other social networking sites, such as Twitter and Pinterest, do the same. An SNS can also make money through selling advertising or stock in its company.

Facebook has proven that social networking can be very big business. Social media and networking sites and blogging sites are now plentiful. Some, such as Twitter, Instagram, and Foursquare, and blogging sites like WordPress, Blogger, and Tumblr, have become popular and influential, with users numbering in the millions. Social media specialists, designers, writers, and managers have joined computer scientists, information technology professionals, and other tech careerists in becoming a large and rapidly growing sector of the modern workforce. It should be noted, though, that much web content is contributed and shared free of charge on many sites and blogs, complicating the situation for those who wish to be paid for such work. More and more people are finding jobs in these "knowledge industries" (Machlup, 1962), in which not goods, or even services related to goods, but the production and exchange of ideas—in fields like education, science, and the mass media—predominate.[4]

The Triple Revolution of the 2000s

The ever-increasing prominence of the internet, mobile communication, and social media networking has catalyzed nothing less than a revolution in social connectedness that has come about largely since 2000. Social network researchers Lee Rainie and Barry Wellman call the confluence of these three advancements the *triple revolution* (2012). Societies at all levels of technological sophistication have been affected.

Prior to this century, it was relatively rare to access the internet with broadband service or wireless technology. Mobile connectivity and social media were in their infancy. Now, approximately 40% of the world's households are connected to the internet (77% in technologically developed societies; 31% in poorer, developing areas), with those in more developed areas increasingly utilizing fairly speedy, often wireless broadband service to do so (Castells, 2011; ITU, 2014; McKinsey and Company, 2014; Zickuhr & Smith, 2013). Of course, in the world's poorer areas, computers and internet service are far more scarce (Castells, 2011; Gronewold, 2009). A wide and deep *digital divide* (see more on this in Chapter 5) separates those who can participate in digital life from those who cannot or do not.

Mobile phones, often kept by users' sides or even attached to their bodies (Katz, 2003; Katz & Sugiyama, 2006), are rapidly becoming ubiquitous. With lower start-up costs than most other forms of digital technology, and with cellular networks increasingly available, mobile phones are becoming more common even in less developed areas, with an overall penetration rate of 89% in developing nations and 63% on the African continent (Pew Research Center's Global Attitudes Project, 2012; see also Castells, 2011). Though, as has been noted, mobile phones are used in much more limited ways in poorer areas of the world, which often have inconsistent internet access and unreliable and/or unaffordable service, the ability to obtain networked information and jobs opens up possibilities for improvement of users' circumstances (Castells, 2011; Pew Research Center's Global Attitudes Project, 2012; see Chapter 8 for more on jobs and work in the digital era).

Increasingly, mobile phones and devices like iPads and other types of digital "tablets" are used to access and make connections on social network sites. In the developed world, about half of all adults use social network sites like Facebook, Twitter, Pinterest, and LinkedIn, including over 80% of adults aged 18 to 29, skewing toward individuals who are college educated and have higher incomes (Pew Research Center's Global Attitudes Project, 2012). When people obtain internet access, social networking is one of the first activities they tend to engage in. This is true even in less developed areas of the world.

Starting in the 1990s, all kinds of specialty services and sites began to jockey for a place on the internet. Online radio stations (beginning in 1994) and retailers such as Amazon (1994) and eBay (1995) found audiences alongside onling gaming, hobbyist sites, and pornography. Sports, news, entertainment, and celebrity gossip sites proliferated. In 1999, Shawn Fanning launched a peer-to-peer file-sharing program called Napster that ushered in a new era in music sharing, distribution, and production. Though it would be shut down two years later due to legal issues surrounding copyright and ownership of the music, it introduced a culture of music dissemination via the internet and digital media that iTunes (2001), YouTube (2005), and streaming services like Netflix and Hulu (both 2007)

exploited with great success (see Chapter 4 for more on Napster, the making and sharing of media, and the dynamics of this participatory culture).

As the web began to experience massive growth in the mid-1990s, investments in broadband capacity began to increase so that there was enough *bandwidth* or information capacity to meet the demand. At the same time, large internet service providers and companies like Microsoft, Google, and Amazon required vast computing power, servers, and online storage. The result was *cloud computing*, one of the most significant computing developments of the 2000s. Cloud computing is "a model for delivering on-demand, self-service computing resources with ubiquitous network access and location-independent resource pooling" (in Naughton, 2012, p. 149). That is, all this digital activity and storage occur in a nonphysical space that exists independent of any hardware and can be accessed from any computerized device. However, serious vulnerabilities exist when data are digitized and remotely pooled.

Information of all kinds began to be generated and spread in abundance. Increasingly collected in large databases, the management and analysis of these big datasets—popularly called *big data*—became ever more critical, especially as knowledge began to accumulate exponentially (Gleick, 2011; Schilling, 2013). As information had become a "primary good" in tech-intensive societies, members began to feel called upon to produce and act on information nearly constantly (Dyson, Gilder, Keyworth, & Toffler, 1994). Skills in accessing, critiquing, and authenticating information became critical. As a result, such societies are sometimes referred to as *information*, *knowledge*, *information-network*, or *network* societies.

The triple revolution is indeed a global revolution. While the benefits of digital technology still disproportionately benefit those who are more powerful, and many are still denied full access, the technology can provide a mechanism, a pathway, for networks to develop and resources to flow to the less powerful. For example, initiatives to bring computers, internet connectivity, and digital literacy to underserved areas have in many cases aided economic conditions and empowered local communities and groups (Alkalimat & Williams, 2011; Hampton, 2010; Haythornthwaite & Kendall, 2010; Haythornthwaite & Hagar, 2005; Mesch & Talmud, 2010; Newman, Biedrzycki, & Baum, 2012; Schuler, 1996, 2008; Schuler & Day, 2004).[5]

This overview of the history of communication technology and media has focused on what is really a small slice of human history—the actions and attitudes that have propelled the creation of technology-rich, computer-saturated societies. We should keep in mind as we reflect on the history of information and communication technology that technology is shaped as much by those who adopt and use it as by its official inventors. Many technologies end up being used in very different fashions than their creators imagined. Perhaps one of the most notable examples of this is the printing press, intended by Gutenberg as a means to mass produce the Bible. Gutenberg was a staunch Catholic and would surely be astonished, and probably appalled, by some of the decidedly nonbiblical content that his technology now helps to produce and popularize. Alexander Graham Bell's telephone invention was intended by him to be a kind of hearing aid, and instead it has been used for people to communicate across distances and is now at the center of a mobile communication revolution. It is the people in a society—you and me, along with

the more socially and technologically powerful, of course—who determine the paths that these technologies will take and the type of societies they will help to create.

Technology brings a critical set of realities to our everyday lives. Think of the ways your life would be different—at the individual, small-group, organizational, and societal levels—if computerization were not impacting it. Your relationships, your online and offline environments, and the experiences you have in them would be different in countless ways. Even *you* would be different. In the next chapter, we take a close look at how techno-social environments are inhabited—how tech-influenced spaces are constructed and experienced. As always, you are asked to personalize what you learn, to apply it to your own life and to seek to better understand the lives of those who may live in different circumstances but likely have similar needs: to survive and find meaning in our complex, rapidly changing world.

Notes

1. For a more detailed history of computing, the internet, and the web, see Griffin (2000), Leiner et al. (2009), Rainie and Wellman (2012), Hafner (1998), Naughton (2012), Standage (2013), Stewart (2014), Cyber Telecom (2014), and Computer Hope (2014), all of which contributed to the foregoing.

2. See note 1.

3. For a more detailed history of early social networking sites and full-featured SNS and social media, see Curtis (2011), Stewart (2014), Naughton (2012), Standage (2013), boyd and Ellison (2007), Hafner (1998, 2004), Rainie and Wellman (2012), Cyber Telecom (2014), Computer Hope (2014), and Ofcom (2008), all of which contributed to the foregoing.

4. See note 3.

5. Portions excerpted from Chayko (2014).

3 Inhabiting a Digital Environment

Sociomental Spaces, Cultures, and Societies

Human beings have always used media and technologies—whether they be cameras, print and electronic media, or computers and mobile devices—to build the environments in which they live and form their relationships. When these environments are digitized, they are always potentially portable. And since they can be accessed by mobile phones and other forms of portable technology (tablets, laptops, wireless devices, even wristwatches, glasses, and implantable computer chips), they can be constructed and carried along wherever an individual goes. Portability is one of the most salient features of a digital environment.

These spaces, and the activities, bonds, and connections formed within them, can also be described as *sociomental* because the connectedness is interpersonal (the *social* part) and relies on cognitive rather than physical activity for its creation and maintenance (the *mental* part). Even people in the closest of face-to-face relationships are sometimes physically separated, so all social connectedness has a strongly sociomental component. But social spaces in which numerous interactions and relationships are developed via a variety of cognitive acts are predominantly sociomental in nature.

One of the very first sociologists, Emile Durkheim (who helped establish the field of sociology), claimed that a society not only transcends the individual; it also transcends the physical. That is, societies are, at their essence, large, collective, nonphysical entities. Durkheim (1893/1964) taught that a society is a "conscience collective"—a collective, shared *consciousness* (mind, or awareness) and, at the same time, a collective, shared *conscience* (morality, or tool for determining right and wrong). Note the subtle but important difference between *consciousness* and *conscience*; in Durkheim's native French, the word *conscience* translates as both "mind" and "morality." This is important because it means that one of the all-time premier theorists of what a society is—someone who has influenced the thinking of millions and who was a primary force in the development of sociology as an academic discipline—has theorized a society as being both mental *and* moral at its essence. For Durkheim, a society encompasses both of these nonphysical states simultaneously and indissolvably and thus (though he did not use the exact word) would be considered a sociomental entity.

A society is made up of the thoughts, ideas, information, norms, values, beliefs, and morals of all of its members. It is a veritable "soup" of mental ingredients, plus the material products created by its members, such as art, books, buildings, and clothing. Collectively, we call these mental and material products the *culture* of a society. People's lives shape, and are shaped by, these products in a process so penetrating and constant that those groups of people who share cultural products are often themselves called a culture. And yet a society, and a culture, is even more than all of this. Something special, almost indefinable, happens when human beings get together. A group "effervesces" and produces an energy, a force, a "vibe," all its own. It is not only mental and moral, it is alive with energy and emotion (Durkheim, 1912/1965).

Though the internet was centuries away from invention when Durkheim was alive, his insights set the stage for the sociomental nature of digital groupings to be better understood and for these groupings to be considered real, legitimate social units. Other

sociological theorists, including Georg Simmel (1908/1950), George Herbert Mead (1934/2009), and Charles Horton Cooley (1922/1964), wrote extensively about the strength, consequences, and reality of *social, mental* groupings. Such groupings, they claim, are the bedrock of society, literally life-affirming and life-saving. People are far worse off (even more prone to suicide, Durkheim famously evinced [1897/1966]) when they are not firmly integrated within social groups and societies that have strong, cohesive *norms* (expected behaviors) and *values* (beliefs).

All social connections and groupings, including those that originate face-to-face, exist in their most complete form in the minds of their members. Social groups are almost always either too large or too widely dispersed, or their participants too busy, for members to get together face-to-face more than occasionally (if indeed then). Just because a social bond or grouping can be described as face-to-face does not mean that the people involved in it spend massive amounts of time physically together. In fact, in a fast-paced, mobile society it may be the case that people do not gather together very often at all. But that does not mean that they cease to be connected when they are not gathered. Groups persist even in the dearth or absence of physicality and even as members come and go (see Anderson, 1983; Cooley, 1922/1964; and Simmel, 1898, on the persistence of social groups).

Digital spaces—social media sites, websites, chat areas, discussion boards, online games, workspaces, classes, conferences, and hangouts, even the spaces in which we share email and text messages—are sometimes called *virtual*. Digital work teams and organizations, in particular, are commonly described as virtual in nature. The use of the term *virtual* is misleading, though, for it implies that something is almost, but not quite, real. And where digital spaces are concerned, that is simply not the case. As sociologist W. I. Thomas has classically stated (in what has come to be called the Thomas Theorum), if people "define situations as real, they are real in their consequences" (Thomas & Thomas, 1928). Digital experiences and the spaces in which they take place are quite real and have real, definite consequences. For this reason, many consider descriptors such as *sociomental, networked,* and/or *digital* preferable to *virtual* in describing these spaces and societies (see Chayko, 2008; Dyson et al., 1994).

Why not *Cyberspace*?

You may have also heard digital space referred to as *cyberspace.* Activities associated with such spaces have also received the *cyber* prefix—for example, cybercrime, cyberpunk, cyberbullying, and cybersex. But many scholars are moving away from calling digital spaces *cyber*, and the story of why this is happening is quite interesting because it is the inventor of the word *cyberspace*, science fiction writer William Gibson, who now warns against its misinterpretation and misuse.

Remember, it was not very long ago that the online experience was brand new and highly unusual. In the 1980s and 1990s, people struggled to define and describe what was then a brand new experience. The most powerful description—the one that stuck—came from Gibson, who, in his 1984 novel *Neuromancer,* stated that when people use computers a "consensual hallucination" could emerge. This collaborative kind of hallucination would exist, he said, in a "notional space" that seemed to be located behind and beyond the computer screen. Gibson called this environment *cyberspace* (1984, p. 69), borrowing the prefix *cyber* from *cybernetics,* which is the study of how various kinds of systems and networks function. *Cyber* has since come to suggest something computerized or modern, of the computer era.

In the early years of trying to understand and predict the impacts of computer use, it was important to have collectively understood concepts with which to describe it. It still is. But the conception of cyberspace as a "consensual hallucination" has become increasingly problematic over time because the experiences and consequences of computer use are now widely understood to be completely real. Computerization is many things, but it is rarely hallucinatory.

Let's follow Gibson's thought process in some depth as he discusses where the term *cyberspace* came from and then consider the possibilities and limitations of the term. Gibson has said of writing *Neuromancer* that

> I was painfully aware that I lacked an arena for my science fiction… . I needed something to replace outer space and the spaceship. I was walking around Vancouver, aware of that need, and I remember walking past a video arcade, which was a new sort of business at that time, and seeing kids playing those old-fashioned console-style plywood video games. The games had a very primitive graphic representation of space and perspective. Some of them didn't even have perspective but were yearning toward perspective and dimensionality. Even in this very primitive form, the kids who were playing them were so physically involved, it seemed to me that what they wanted was to be inside the games, within the notional space of the machine. The real world had disappeared for them—it had completely lost its importance. They were in that notional space, and the machine in front of them was the brave new world.
>
> The only computers I'd ever seen in those days were things the size of the side of a barn. And then one day, I walked by a bus stop and there was an Apple poster. The poster was a photograph of a businessman's jacketed, neatly cuffed arm holding a life-size representation of a real-life computer that was not much bigger than a laptop is today. Everyone is going to have one of these, I thought, and everyone is going to

> want to live inside them. And somehow I knew that the notional space behind all of the computer screens would be one single universe… .
>
> But what was more important at that point in terms of my practical needs was to name it something cool, because it was never going to work unless it had a really good name. So the first thing I did was sit down with a yellow pad and a Sharpie and start scribbling—infospace, data space. I think I got cyberspace on the third try. (as quoted in Newitz, 2011)

Computerization, of course, has since migrated from huge plywood video games and barn-sized consoles to interfaces that are smaller and more portable. But William Gibson's view of cyberspace as the universe "behind all the computer screens" was, and still is, critical to helping us envision, understand, and define the environment and the experience of becoming involved in computer use.

As Gibson himself has stated more recently, though, this universe has changed from this original notion, and dramatically so. "Cyberspace, not so long ago, was a specific elsewhere, one we visited periodically, peering into it from the familiar physical world," he wrote. "Now cyberspace has everted. Turned itself inside out. Colonized the physical" (Gibson, 2010). In other words, Gibson notes, the space behind the screens has become enlargened and intersects with—even encompassing at times—the physical. Incidentally, Gibson believes that Google is the primary "architect" of this new universe (Newitz, 2011).

But a more damning critique of *cyber*, and therefore of *cyberspace* as a construct, is found within Gibson's own description of cyberspace above, in the first paragraph, in which he shares his sense that "the real world had disappeared" for the children playing computerized video games. This was an early view of, and a widespread worry about, computer-mediated communication (CMC) and internet use. Mass media and computer use were often seen as generating pseudo, imaginary, or parasocial (one-sided) connections rather than genuine, potentially reciprocal ones (see Beniger, 1987; Caughey, 1984; Giles, 2002; Horton & Wohl, 1956). As clear evidence of the authenticity of these connections and the reality of techno-social life began to mount up, though, it became apparent that cyberspace was anything but a hallucination, consensual or otherwise.

As researchers learn more and more about how real and consequential digital environments are, and how authentically they are experienced, the term *cyberspace* is becoming less and less precise a descriptor. Along with other *cyber*-prefixed words, it has become subject to misinterpretation. Phenomena described as cyber can too easily be seen as less than real, their qualities and consequences seeming to derive more from their connection to computerization than from the behavior itself. For example, cyberbullying can seem to be harmful *because of* the technology by which the behavior takes place, rather than due to the harassing behavior itself, which would be harmful delivered in any form. Cyber infidelity can seem to be caused by one's habit of spending time on the computer, rather than by the decision to betray a partner during that time, which many would find hurtful in any context. The *cyber* prefix implies that the technology in and of itself is what matters most about a tech-related phenomenon and causes its outcome, rather than the person using the technology, which, as we have seen, is called technological

determinism. Bullying, harassment, cruelty, and betrayal are harmful and troubling in any context—digital or face-to-face—and are the handiwork of humans, not machines.

At this writing, the term *cyberspace* seems to be fading from use (Rennie, 2012), but technological determinism is still very much present. Examining the range of ways in which people use and are impacted by digital technologies is a more fruitful course of action than blaming the technology. The adoption and use of terminology that encourages such examination would be widely beneficial. In digital contexts, as in all contexts, words matter.

Online Communities, Networks, and Networking

Much research has been devoted to the study of how communities and networks operate in these digital, sociomental spaces. Community, perhaps the most sociological of all concepts (Wolfe, 1989, p. 60), is also one of the slipperiest. It can describe a group of people who live within a specific geographical area, and at the same time it can refer to the intangible, often highly emotional sense of belonging to such a group (see Bell & Newby, 1974; Chayko, 2002, 2008, 2014; Fernback, 2007; Gottschalk, 1975; Hewitt, 1989; Hillery, 1968; Hunter, 1974; Parks, 2011; and Scherer, 1972, for discussions of this distinction). It can also be appropriated by organizations hoping to reap the benefit of the term's warm connotations for commercial and marketing purposes (Baym, 2010, p. 74; Preece & Maloney-Krichmar, 2003).

But a community is far more than warm connotations. Both good and bad things happen in communities, and these things—and these spaces—are not always warm and fuzzy. To become and feel part of a unit larger than oneself, whether that unit has spontaneously arisen or been deliberately constructed, has a wide range of consequences for individuals. Being a part of groups and communities that we can turn to in good times and bad helps people live a balanced, healthy life, even as it provides that life with infinite complications.

Communities are constituted of, and provide for their members, regular, patterned, personalized social interactions. In them, people develop a shared identity, culture, purpose, and fate, and feelings of togetherness and belonging. All of this is critical to helping individuals find meaning in life and form interpersonal attachments. These qualities have been considered by sociologists to be key components of community since the earliest days of the discipline. And the internet and digital media readily inspire and facilitate the creation and establishment of communities (see Cooley, 1922/1964; Durkheim, 1893/1964; Simmel, 1908/1950; and, more recently, Amit, 2002; Anderson, 1983; Baym, 2010; Bell & Newby, 1974; Bellah, Madsen, Swindle, Sullivan, & Tipton, 1985; Bourdieu, 1985; Chayko, 2002, 2008, 2014; Erikson, 1966; Fischer, 1982; Hampton & Wellman, 2003; Hillery, 1968; Jones, 1995; Kanter, 1972; Mazlish, 1989; Parks, 2011; Shibutani, 1955).

Online communities are "social aggregations that emerge from the Net … to form webs of personal relationships" (Rheingold, 1993, p. 5). They can exist wholly online or can have a face-to-face component. When asked to describe the social groupings they form or encounter online, people often invoke the word *community*, as did the overwhelming majority of those whom I interviewed in my *Portable Communities* research exploring the social dynamics of online and mobile connectedness (2008). They repeatedly referred to the online groups to which they belonged as communities, even though I did not use the word in my initial interview questions to them. Furthermore, these groupings were invariably described as close and meaningful. People responded to my questions about the experience of being part of such groups by saying things like "I feel I am part of a tight-knit community that cares about one another" and "My group is an extremely tightly bonded community that simply cannot be found in normal daily life" (Chayko, 2008, p. 7; see also Baym, 1995, 2000, 2010, p. 64–75; boyd, 2006, 2007; Cavanagh, 2009; Cerulo, Ruane, & Chayko, 1992; Chmiel et al., 2011; Haythornthwaite & Kendall, 2010; Kendall,

2002; Licklider & Taylor, 1968; Parks, 2011; Poor, 2013; Rotman & Preece, 2010).

Not all individuals form online connections and communities with ease. Some people seem to be more likely than others "to accept online friendship formation as possible, or even desirable," sociologist Zeynep Tukekci suggests in her study of friendship on social network sites (2010, p. 176; see also Tufekci, 2008). She calls those who form online connections less easily and less often the cyber*asocial* and notes that for such individuals, "face-to-face interaction has inimitable features that simply cannot be replicated or replaced by any other form of communication" (2010, p. 176). This does not mean that the cyberasocial necessarily refuse to use all digital technologies—they may be more comfortable using technology in some circumstances, such as to coordinate plans, more than others, such as to hang out online or to broaden their social networks (Tufekci & Brashears, 2014). It should not be assumed, then, that everyone uses digital tools and participates in digital contexts similarly, with the same aims.

Online groupings are so often considered to be genuine communities by those who create them in part because ICTs tend to give those who use them a very strong "sense of place" (Meyrowitz, 1985; see also Polson, 2013). Storytelling via oral and written communication is known for its *transportedness* (Biocca & Levy, 1995; Gerrig, 1993; Kim & Biocca, 1997; Lombard & Ditton, 1997; Radway, 1984). In providing forums for the telling and retelling of stories, social media specializes (as do the mass media of television, radio, books, etc.) in mentally transporting people who share similar ideas and interests to specific, similarly envisioned environments.

Stories shared via technological mediation tend to be envisioned as occurring in a specific place—often a neighborhood or a community (Kim & Biocca, 1997; Lombard & Ditton, 1997; Morley & Robins, 1995; Schwartz, 1981). Communal language and imagery are plentiful on social network sites, as in "Facebook helps you share and connect with the people in your life" (Parks, 2011, p, 106; see also Gere, 2012). The metaphor of the neighborhood or community gives members a common image they can use to make their digitally mediated experience more collective, more visible, even more tangible (Hampton, 2007; Lambert, 2013; Parks, 2011).

Online groupings, then, are readily referred to and experienced as communities. And "communities are clearly social networks," sociologists Keith Hampton and Barry Wellman contend (1999, p. 648). The development of social networks permits and encourages the emergence of group cultures and communities (Yuan, 2013; see also Adams & Allan, 1998; Amit, 2002; Cavanagh, 2009; Lee & Lee, 2010).

The study of social networks harkens back at least as far as the teachings of Georg Simmel (1908/1950), who at the turn of the 20th century wrote about the impact of a network's size on the nature of the interactions among its members. Simmel studied social units even as small as two and three (called *dyads* and *triads*) and considered them to be social groupings that can teach us a lot about how groups are structured and affect people. Simmel demonstrated, for example, that when a network expands from two to three, relationships in the network are changed most critically, for alliances and collusions become possible. The nature of the network can be altered by the number of people in it and by its form or structure even more than by its content or the specific nature of the activity people in it engage in (1908/1950).

More modern analyses of networking have contributed much to the understanding of how social networking operates online. In his study of what has been called the *small world phenomenon*, psychologist Stanley Milgram asked people to forward a letter intended for a certain person to someone whom they thought would most likely know that person. He found that it took on average only five or six forwards for most letters to travel to their destinations—a finding which has given rise to the phrase "six degrees of separation" (Milgram, 1967). Network researchers Duncan Watts and Steven Strogatz (1998) have applied this concept to different kinds of networks with much the same results, concluding that most of our human-created networks are well connected and interconnected (see also Boase & Wellman, 2006).

Barry Wellman, along with many of his students and coauthors, has pioneered the study of how digital social networks connect us both locally and globally (see, e.g., Boase & Wellman, 2006; Hampton & Wellman, 1999, 2003; Quan-Haase & Wellman, 2002; Wang & Wellman, 2010; Wellman & Tindall, 1993). If societies are undergirded by a scaffolding of networks, as this (and related) research suggests, it makes sense that people would use the internet and the web to build and grow these networks. Individuals come to count on the resources, connections, and social capital that are obtained and exchanged via these networks. They then become motivated to create more and more networks and develop a strong reliance on them.

For those with access to mobile and social media, online networks and communities can be formed nearly any time, anywhere. They are especially popular in the United States, with over 72% of American adults engaging regularly in social networking online, including 89% of adults 18 to 29 and 43% of those aged 65 and older (Brenner & Smith, 2013). In what Lee Rainie and Barry Wellman have termed *networked individualism*, people strategically operate, switch among, and use these networks as needed. "Networked individuals have partial membership in multiple networks and rely less on permanent memberships in settled groups," they explain. "Technologies such as the internet and mobile phones help people manage a larger, more diverse set of relationships… . The new media is the new neighborhood" (2012, pp. 12–13).

The strength of the ties and communities that connect people in high-tech societies is frequently questioned. In fact, both strong and weak ties—and everything in between—are found in online networks (Brenner, 2013; Ling & Stald, 2010; Wang & Wellman, 2010; Hampton, Goulet, Marlow, & Rainie, 2012; Hampton, Goulet, Rainie, & Purcell, 2011; Rainie & Wellman, 2012; Chayko, 2008; Haythornthwaite, 2005). The closest of relationships are built and sustained via digital technology, but more fleeting, ephemeral ties are in evidence as well. Most individuals' social networks contain hundreds of social ties that are weak, strong, and in between and that are both face-to-face and digitally enabled (Caughey, 1984; Chayko, 2008; Hampton et al., 2011; Preece, 2000).

Even so-called weak social ties have great utility. As sociologist Mark Granovetter has established (1973), weak ties bring into contact people who might otherwise have no way to know of one another at all, thereby opening up pathways which eventually provide *all* members of one social network with access to *all* the members of a second network. Novel information and social capital move along these pathways from one set of people to another (Bakshy, Rosenn, Marlow, & Adamic, 2012; Haythornthwaite, 2005).

Communities are dense with these crisscrossing pathways and networks, and they provide numerous opportunities for people to become connected online and offline, for new groupings to form, and, in all this connective activity, for societies to become more cohesive. In essence, networks help to “stitch” societies together.[1]

Creating Digital Environments

People build their social spaces and environments as they communicate with one another. Shared symbols, such as language, images, sounds, gestures, and avatars, help people envision, build, communicate about, and understand the meanings of these spaces. Symbolic representations of other people (thoughts of them, images, photos) remind us of others when they are not physically with us so that we can continue to bond with them, even in their absence.

Members of groups create and use symbols constantly: sports teams and schools have slogans, logos, and representative colors; friends and families have favorite foods, nicknames, and catchphrases; and religions and nations grant great importance to icons, statues, pictures, and documents. These symbols, in effect, stand in for people and groups because a group is "too complex a reality" to be retained in the mind (Durkheim, 1912/1965, p. 252). Most modern individuals are part of many groups that cannot all remain in our minds all the time. So the symbol—like a flag or a logo—is "treated as if it were this reality itself" (Durkheim, 1912/1965, p. 252). It brings the group into the minds of its members whenever it is seen or deployed and does so so reliably that it inspires the same powerful feelings as the group does. It can even be treated *as* the group.

This is why people can become so intensely emotional at the performance of a symbolic gesture like flag burning or flag saluting or the playing of a religious or national anthem. Flags and anthems bring to mind the reality of a nation or group so concretely and powerfully that they bring the reality of the group to the fore. The burning of a flag, for example, can feel like the actual destruction of the nation. Of course, whether we are face-to-face or online, we can never interact with an entire nation or even the entirety of a large group, but because the symbol stands in for it, we are still able to *feel* our sense of belonging to that nation or group—we can feel and appreciate its complex reality. We can feel community with others in the group even though the group is not, and may never be, physically gathered in one place at the same time.

Symbols, therefore, are critical to helping people to express and experience the reality of their digital worlds. Along with metaphors, they also help people explain their worlds and evaluate the comparability of items within them. This helps people determine their "place" in these worlds. Digital phenomena can be compared to books (Facebook), clouds (the nonphysical space where so much data are stored), streams (a flow of or mode for the delivery of data), bulletin boards (online discussion spaces), and town squares or forums (the Foursquare app, online message forums, etc). Even the web and the net are metaphors. Look for the many examples of this online—of physically separated people using metaphors that suggest physical objects or spaces. Metaphors and symbols help the individual imagine and envision things, people, and places that are otherwise abstract or invisible, and they also help groups of people envision them similarly.

However, metaphors are limiting as well, for they represent assumptions that constrain us from thinking about things differently. For example, thinking about data as being collected and stored in a seemingly airlike, remote "cloud" may prevent people from pursuing further details about exactly how their data are being stored and secured, and at whose hands. The casual use of metaphors, therefore, can hinder more precise understandings of

digital and data-related phenomena and the impact they can have (see Hwang & Levy, 2015).

Ritual activities performed by members of a group also bring groups of people to mind similarly and reliably. Activities performed periodically in ritualized ways (religious services, holiday gatherings, parades, etc.), whether face-to-face or technologically, enable people to have regular interaction and involvement with one another. People who post updates to Facebook, Twitter, or any other social networking site frequently, or who text one another (perhaps in a group text) in a patterned way, open up a portal by which they can be reliably seen and contacted. This provides them with regular opportunities to view and exchange symbols with others and to have an ongoing sense of the group, which generates strength and coherence for the group (Chayko, 2002, 2008).

The mass media also assist in making digital spaces similarly envisioned and experienced. Television, radio, newspapers, and magazines (and even old-school media like billboards, posters, bumper stickers, flyers, etc.) can popularize and spread a group's symbols (even elevating some of them to iconic status), inspire rituals, and keep groups in the public (and their members') eye. Along with social media, the mass media depict actual members of groups engaging in activities from time to time (whether it be marching in protest, enjoying a concert, or attending a party). All this mediated activity can strengthen the group further and help bring it more concretely into members' minds (Chayko, 2002, 2008).

A digital space called a *platform* is a computerized framework on which an application can run. Platforms can be blogging sites like Blogger and WordPress, social media sites like Facebook, Twitter, and Instagram, video-streaming sites like Netflix, Hulu, and YouTube, or audio sites like iTunes and Spotify. While platforms are initially designed from the top down, they are also shaped from the bottom up, each taking on a style, logic, and grammar—or vernacular—all its own. For example, the Twitter *hashtag* (or #) was developed by users rather than being "designed-in" (Bruns & Burgess, 2011). It then spread to other platforms, such as Facebook and Instagram, and is even used in face-to-face conversation, sometimes accompanied by a gesture intended to replicate the symbol. Platform vernaculars, then, are communally developed, shared, and spread and are anything but fixed or static.

The hashtag, in which the # symbol is followed by a word or phrase, is a way for people to mark a topic or a moment in a digital environment and then identify and find others using the same word or phrase—forming, if one wishes, a kind of group with them. The hashtag facilitates the gathering of people in online spaces for "Twitter chats" and the communication and curation of information at conferences and other events. It is also used rhetorically in at least five distinct ways: to emphasize, critique, rally people together, identify characteristics of the writer, or iterate a well-known internet *meme.* Like other cultural artifacts, memes—representations of pop culture that can take the shape of a text, video, or photo with words that are often jointly created and remixed by multiple individuals—can evoke such a sharp or emotional response that they can spread widely and quickly through digital networks and be said to go *viral* (Bruns & Burgess, 2011; Daer, Hoffman, & Goodman, 2014; Milner, 2013; Zittrain, 2014).

In all these ways, digital spaces and the activities that take place in them are

collaboratively envisioned and created. They are shaped and reshaped, individually and jointly, again and again, as people enter and exit these spaces and come to feel a sense of one another as truly *there*. In the process, digital environments are given form, texture, contour, depth, and detail—in short, *reality.*

Reality, Presence, and Proximity

Digital life is, simply, real life. The reality of living with technology, especially in computerized/digital form, is sometimes described as an *augmented reality* (Jurgenson, 2012a), which means that digital technology has enhanced, or augmented, the environment to a significant extent. For people who live in technology-intensive societies, this happens all the time. But the truth is that even before the age of computerization, life has been augmented by technology.

From the earliest of times, human beings have created tools that would enable them to build shelters, utilize fire, colonize the natural world, transmit information to one another, and defend their territories—in short, to do whatever it took to survive. As we saw in Chapter 2, the invention of spoken and then written languages allowed people to make greater sense of the raw phenomena they encountered every day and to communicate in increasingly more abstract and complex ways across time and space. People have always used tools and technologies to build and augment their societies. In modern societies, all kinds of ICTs enable the transmission of concepts and ideas.

Online experiences, and the social connections and environments created with the assistance of digital technologies, are a critical component of modern techno-social life in which people's responses are genuine, meaningful, and often profound. When we are online, our brains and bodies think and feel and act. We may experience bodily fatigue or pain, worry or be delighted, make a friend or become involved in an altercation, strengthen a relationship or destroy one. What a person does online has an influence on the rest of one's life because it is *a part of* that life, not a separate thing. It is important, then, to think about and describe this environment in ways that highlight its realness—for example, *not* to call the face-to-face realm IRL (which means "in real life" and wrongly promotes the idea that the face-to-face sphere is more real than the digital).

In my interviews with people who find and form connections over the internet, I heard many descriptions of how unexpectedly deep and authentic these connections could become. For example, as a member of an online group dedicated to religion told me,

> I didn't come (to this online group) looking for friendship, and am surprised at how some of the regular posters have become real people to me. Some of them just have a very personal way of expressing themselves that I've come to recognize, and sometimes, to like very much. This has nothing to do with spelling or mental brilliance or even depth of faith, for that matter. I think what draws me to some people here is their authenticity and their willingness to be imperfect. But even the ones I don't especially like have touched my heart to the extent that I sometimes worry about them and wish I could reach through the computer and help them, somehow. In fact, now that I think about it, it is amazing how real some of these distant, unseen, frequently anonymous message board posters have become. But, of course, they *are* real! (Chayko, 2002, p. 114)

The authentic and deeply personal nature of the connections and communities that are

formed in digital spaces has been a common theme throughout my research.

People also told me that they felt that they could get to know very well even those individuals whom they encountered exclusively online, absent any face-to-face interaction. In response to my request for a description of the "personal" nature of the online relationship, one young woman mused,

> How can it be personal? It *feels* like it is. If people said, "Oh, gee, do you know so and so?" I would say yes. I wouldn't say, "Oh well, I met him once." I'd say, "Oh yes, I know him." (Chayko, 2002, p. 86)

Because online social connections are so often experienced as absolutely real and deeply personal, it is but a next step to perceive digitally encountered others to be *present.*

The internet and digital media facilitate the perception and experience of proximity and presence in ways that transcend the physical. When connecting online, those with whom we connect are often perceived to be "really there." This sense that the other is "really there" is called *social presence.* According to the Social Presence Theory advanced by communication scholars John Short, Ederyn Williams, and Bruce Christie, a communication medium can provides its users several ways to become aware of one another's presence. They can know one another's qualities, characteristics, and inner states and begin to perceive and experience one another as socially present (Short, Williams, & Christie, 1976). This theory, which predated the internet and digital media, has since been updated to explain the variety of ways that people can use these technologies to be cognitively present to one another even as they are physically distant (see Chayko, 2002).

Feeling the nearness or presence of others across distances has been called *perceived proximity* (O'Leary, Wilson, & Metiu, 2014) and, when electronic media facilitates the connection, *electronic propinquity* (Korzenny, 1978; Walther & Barazova, 2008). In a large-scale international study, professors of business Michael O'Leary, Jeanne Wilson, and Anca Metiu found that colleagues working hundreds of miles apart from one another communicated as often, on average, as colleagues who were located in the same office. Additionally, colleagues separated by distance felt the same level of shared identity and sense of cognitive and affective closeness as those who worked together in the same location. Individuals at work, the researchers determined, can form strong bonds despite being separated by large distances.

Similar effects have been found when popular culture is the mediating element among physically separated people. Sharing common interests in a television show, movie, or type of music can bring about a strong sense of shared identity and community among devotees. They, too, can come to feel that they inhabit a social world with one another. Cultural products and franchises that can inspire such involvement among users have an excellent chance of popular success. Communication and media professor Henry Jenkins calls this "the art of world making" (2006, p. 21; for more on this, see Chapter 9).

With the advent of digital and mobile technology, however, members of any group or "world" can enjoy *ambient copresence*—an ongoing but background awareness of the

presence or nearness of others (Ito & Okabe, 2005, p. 264; see also Chayko, 2008, 2014; Gray et al., 2003; Quan-Haase & Wellman, 2002). Portable devices allow users to keep their channels to one another open nearly all the time if desired, checking in on one another often and even leaving "away messages." These short, frequent updates convey that one is "there" (see Park & Sundar, 2015). It is becoming common for groups of people (especially younger people) to stay in near-constant contact with one another this way via group chats, texts, and tweets (see Chayko, 2008).

Social media and blogs do much to enable a sense of presence among dispersed users. They allow the presentation of experiences and stories neatly and simply. They provide opportunities for individuals to share ideas, enter a conversation, and gain a sense of the presence of others in the conversation or group. Core members of social media and blogging communities, the most active participants in the group, are most likely to welcome new members or to monitor and enforce (formally or informally) the rules and norms of the group. Having had a stake in it the longest, they tend to take on the responsibility for safeguarding and communicating the group's collective memory and identity. But even those who lurk in the group or participate less actively help to shape it and can have their presence sensed (Chayko, 2008).

Often, ambient copresence takes place in spaces defined either formally or informally as online "hangouts"—the kind of spaces in which people can spend unstructured time with few (or no) obligations and responsibilities. Over 70% of adult U.S. internet users go online at least occasionally just to pass the time or to have fun (Rainie, 2011). They may pass the time leisurely lurking or hanging out on a social media platform like Facebook or Twitter, checking out a discussion board, visiting a chat room, playing a game, reading a blog, spending time in a Google hangout, or some combination of these. It is possible to spend large amounts of time in such spaces, entire days and nights, just hanging out, checking out what others are doing and saying—not necessarily interacting with them but still sensing others' presence in an ambient way, feeling a sense of perceived proximity and community with them. "I just like being there," one woman told me, describing her affinity for an online hangout, "and I don't know why" (2008, p. 30).

Sociologist Ray Oldenburg calls these kinds of hangouts *third spaces* (1989). They are places other than homes and workplaces—the first and second spaces—in which people spend time and relax, usually without a fixed agenda. While Oldenburg focuses on casual offline places, such as coffee shops, pubs, beauty shops, etc., the concept is quite useful to also describe the kinds of informal online spaces in which people simply hang out. And such spaces are plentiful.

Hangouts, both physical and digital, are important because they provide a space for people to spend unstructured time in the company of others. They permit individuals to engage different aspects of their lives and identities than they do at work and at home. By spending time with those who are like-minded, simply experiencing a sense of shared identity and culture, individuals can feel known and accepted.

Presence in third spaces is optional and voluntary and there are no requirements. In them, people can get to know one another (or not) in a low-obligation, low-pressure way. Spending time in third spaces can help people relieve everyday stresses while they make contacts and feel a sense of community. Being around others in this kind of environment

can help people relax, since the kinds of obligations that exist at work and at home are absent. They can also make the individual feel part of the larger society, part of the culture, connected to others.

Lurking or participating minimally, or lightly, in third spaces can provide the opportunity to be part of a larger dialogue, to gain a sense of others and their conversations. It also provides that all-important, life-affirming feeling of being "plugged into" or integrated into a society (we discuss this in greater depth in Chapter 9). Because it is so critical for people to feel connected in this way, it is generally healthy to spend some time in third spaces, and so these spaces can be seen as good or "healthy" for the society as a whole. Spending too much time in them, though, can certainly represent or lead to an unhealthy escape from offline responsibilities.

Sometimes, to be sure, people do not feel the nearness of others when they are online. They feel solitary, alone. But more often, they feel proximal and connected, part of meaningful social worlds. And, as it turns out, the brain is wired to consider these social worlds to be fully and completely real.

Reality and the Brain

The mind and body are intricately connected. They affect one another continuously, as can be seen in physical illness that derives from psychological disturbance, or in mental confusion that results from physical fatigue. Our minds and bodies "talk to" and inform one another all the time. They are a unit, finely meshed (Chayko, 2008, p. 41; Goleman, 2006).

The brain considers both digital and physical forms of connectedness equally real. Mental images that correspond to all kind of experiences—whether physical or digital in nature—are recorded in the same part of the brain. The same exact cognitive processes are used to encode, process, and retrieve these images, whether they originated in physical experience or in mental experience. This is how we can sometimes be unsure whether something in our past actually happened or whether we simply imagined that it occurred. As brains store both physical and mental phenomena in the same way, in the same place, they "code" physical and mental phenomena as equally real (though, like all body parts, brains are also imperfect and fallible; see Chayko, 2002; Neimark, 1995).

Human beings can respond to both digital and physical phenomena in similar ways as well. Once an event has occurred—whether in physical or sociomental space—it becomes interpreted and assigned meaning. Realness—or degrees of realness—can be assigned to any event. Individuals can also identify different types or spheres of reality as being meaningful and consequential. These realities—which include the "reality of everyday life," dreams, fantasies, games, fiction, religious experience, erotic experience, and even drug-induced states—each carry their own norms, rules, and logics and can feel entirely (if temporarily) real (see Berger & Luckmann, 1967; Caughey, 1984; Davis, 1983; James 1893/1983; Schutz, 1973). "We live not in one reality but in two (at least)," sociologist Murray Davis notes of everyday life, "and we continually alternate between them, often against our will" (1983, p. 10).

Furthermore, the brain and body often respond to mediated and digital events in the same way that they would respond to those that take place face-to-face. When watching TV or a movie, reading a book, listening to music, or using social media, it is common to become so cognitively and emotionally engaged in the event that the body responds as if the event were unmediated. The brain's cognitive and perceptual systems prepare the body for the situations that are confronted, and, physiologically, the body and brain respond. We cry, we laugh, we sweat, we cheer, we move our bodies (Bellur & Sundar, 2010; Reeves & Nass, 1996).

People can even on some level come to perceive their computers and cell phones as interactants with whom they have a relationship and can respond to them in kind (Chayko, 2002; Reeves & Nass, 1996). Voices (like the iPhone's Siri), images (like an avatar), and actors and others who appear on media screens can be cognitively and affectively encountered and sometimes even communicated with. These perceptions can easily resemble those of human-to-human interaction and relationships.

Robots and *bots*—humanlike machines and web-based software applications that run automated tasks—are becoming in some cases interactive and seemingly personable. Such machines and applications can be comforting and help people cope with challenges and

even provide some forms of social support (see Kellerman, 2012), although there are limits to the types of communication that the artificial intelligence of computers can perceive (Siri, for example, cannot detect sarcasm; see Zawacki, 2015). Despite the rich, seemingly human interactions enjoyed by the fictional protagonist Theodore and his computer's automated intelligence system Samantha in the movie *Her*, or the relationship between Caleb and the robot Ava in the movie *Ex Machina*, computers and software as currently configured lack the human experiences and understanding of emotional subtext necessary for communication to be deep, nuanced, and truly human.

Still, people can engage in meaningful ways with digital technology and especially those machines that are most realistic. Robot dogs, dolls, and toys have been known to comfort those who spend time with them—particularly those in greatest need of comfort, such as the elderly (see Turkle, 2012a). People report that their children with special challenges and needs have been helped through digitally mediated interaction. Parent Ron Suskind, for example, has described how his autistic son came out of his shell through engagement with Disney characters, while Judith Newman has written of how her autistic son Gus's conversations with Siri improved his communication skills and provided him with companionship (Newman, 2014). Newman reports that Gus's practice conversations with Siri have resulted in increased facility in interacting with human beings. So many people now indulge in conversations (whether playful or serious) with these kinds of digital tech "assistants" that SRI International, the research and development company behind the voice of Siri (now owned by Apple), is focusing research efforts on enhancing the ability of the assistant to engage in even more complex and realistic conversations (Newman, 2014).

For the most part, those who use such technologies understand the difference between physical and mediated realities. Judith Newman makes it clear that her son Gus is well aware that Siri is mechanized and not an actual human. Fictional characters and disembodied tech voices are generally encountered as created constructions that retain a strong element of reality. One can be well aware of but still "play with" the difference between fiction and nonfiction. In enjoying fictional or mediated experiences, it is common to play freely and flexibly with the concepts of reality and fantasy. In other work, I have theorized that mentally approaching fictional characters as real heightens the pleasure of the fictional experience and can even provide a practice space for making and maintaining digital relationships with real people (Chayko, 2002; see also Chayko, 1993; Jenkins, 1992; Harrington & Bielby, 1995).

Some people claim that digital environments are rife with deception and hence less real than offline spaces—that the relative anonymity found in many digital spaces breeds deceit, falsity, and danger. Indeed, deception is a possible outcome of digital tech use, given that face-to-face accountability is diminished. Other possible negative outcomes include nasty or hurtful verbal exchanges, harassment, the causing of physical harm, stalking, identity theft, drug sales and trafficking, and a greater availability of pornography and sexually oriented material. It is worth remembering, though, that these behaviors exist in physical space as well—albeit in different ways, with different social dynamics and outcomes.

Deception and secrecy are common in the physical world and so would be expected to

exist digitally as well (see Baym, 2010). People lie to one another frequently—multiple times nearly every day, by some estimates (DePaulo, 2004; Feldman, Forrest, & Happ, 2002; on secrecy, see also Nippert-Eng, 2010). This kind of behavior occurs online and offline. But conscious, deliberate attempts to deceive others online, and the taking on of different identities, do not occur to the extent that many worry about (Baym, 2010). When gender switching takes place, for example, it is usually a role-playing or game-playing experiment rather than an act of deliberate deceit. The majority of those online do not undertake experiments in which they take on a different gender identity, and most of those who do abandon the practice (Roberts & Parks, 1999; see also Martey, Stromer-Galley, Banks, Wu, & Consalvo, 2014). For the most part, when people interact online, they do so as themselves, carrying with them their identities, personal values, and standards (see Chapter 6).

In Western society, the mental realm tends to be stigmatized relative to the physical, so people often do not consider mental phenomena to be as consequential as the physical. The mental is still often seen as not *really* real—mental illness, for example, is less well understood than physical illness; it may not even be covered by some insurance plans because it is not considered "real" illness. When people say that something is "all in your mind," it is implied that something authentic is absent. But this is a false and even dangerous bias that minimizes or discounts people's lived experiences.

It simply isn't helpful to think of digital, mental activity as a species separate from, outside of, or less than real life—not when real life (whatever that is) is drenched in cognitive activity. It is a false dichotomy. The mental *is* real, and it is all around us, not just in our heads. And the physical and the mental are inextricably enmeshed. As a result, online experiences can be as richly emotional and deeply intimate as those that directly emerge in face-to-face interaction.

Emotionality and Intimacy

It is common for time spent online to have an intimate, emotionally rich dynamic. Intimacies and emotions are exchanged profusely and nearly instantaneously online. In fact, they serve as a kind of "glue" for the relationships that form there. This "emotional glue" is especially important in the absence of the "physical glue" that face-to-face interaction can provide.

Digital environments and the experiences created in them can be extremely, perhaps surprisingly, intimate. As social creatures who desire interpersonal closeness, human beings are highly creative in finding and forging intimacy, including in digital settings. While a wide variety of types of relationships can form online, spanning the spectrum of human intimacy, even the most fleeting of relationships can be highly intimate when those involved disclose a great deal about themselves and feel that they have come to understand much about the other person as well. It is this kind of personal disclosure and understanding, and the positive progression of a relationship (even if it does not turn out to be especially long term) that render it intimate and meaningful. Short-term relationships can be highly intimate, just as they can be offline.

The human need and desire to form intimate relationships is so strong that it happens all the time online, often without great difficulty. Mobile and social media play a big part in this. Since many people take cell phones with them wherever they go, they can use small bits of time to check in on others and/or provide updates, whether by Facebook or Twitter or some other social media platform. Interestingly, this is how intimacy tends to develop face-to-face as well—in the small, everyday moments of connection as much as in grand gestures and experiences. And with a device with which to connect and network always at one's side, it has never been easier to remain in constant contact with others, even a large number of others, and to find that intimacy has developed, sometimes quite unexpectedly and swiftly (see Chayko, 2002, 2008; Fortunati, 2002; Fox, 2001).

The emotions that arise in digital environments are those that sociality inspires in all of its forms. Feelings of warmth, belonging, intimacy, even excitement are commonly generated online. Fear, anger, and disgust are elicited as well. A surge of emotion often arises when two or more people feel that they "click," whether online or offline (Baker, 2005; Chayko, 2008). This feeling can be so strong and satisfying that to obtain it can be central to people's desire to use social media (Chayko, 2008; Chmiel et al., 2011).

I have termed these emotional surges "the rush of human engagement" because they are generated in and by the human engagement so often sought and found online. In my research, many described it exactly that way—as a "charge" or a "rush." People told me of crying real tears when learning of a tragedy online, experiencing a surge of excitement upon getting good news or receiving just the right text at the right time, becoming angered or enraged when a negative comment was placed on their blog, or becoming downright giddy when an online exchange became flirtatious or romantic. These waves of emotion can provide "a rush that I really can't explain," as one online connector described it to me (Chayko, 2008, p. 77). According to another,

> It's great when you find somebody that loves the book that you love. The feeling is

> kind of “Oh, wow!” Or “Oh, me too!” … I think it’s cool. I think it’s neat. And I like those kind of connections. And I have even tried to sort of cultivate them… . [“Can you describe these connections for me?” I asked.] Oh, they’re definitely bonds. (Chayko, 2002, p. 70)

In short,

> Sometimes when I get back to my room I just move the mouse and go to my favorite site and check my profile, and it’s like someone has left me gold or something! (Chayko, 2008, p. 62)

This rush of excitement can be similar to the rush one gets from drugs, sex, gambling, chocolate, and other things that activate the pleasure centers in the brain. (For more on how this works, see Chapter 7.)

MIT internet scholar Sherry Turkle claims that people sometimes turn to information and communication technology when they *want* to feel something. They use the technology as a kind of conduit for emotion and use it to express love, hate, fear, rage—basically any mood imaginable. People also go online to moderate or to try to control their moods and emotions (see Chayko, 2008).

But this doesn’t always happen—and in fact there is great unpredictability in people’s emotional responses to digital connectedness. Sociality, in any form or context, can generate the full range of human emotions. Human interactions are messy, unpredictable, and fraught with risk. There is plenty of sadness, anger, disappointment, and conflict online, as these are human responses to the “dance” of interaction. Examples abound of sad, unfortunate, even fatal outcomes—for example, relationships that have ended at the suggestion of online infidelity, or lives that have ended when online bullying or public embarrassment became too much to take. Events that take place in a digital environment have profound consequences for people and are inordinately, undeniably, real.

So, What About Physicality?

It is sometimes hard to understand how community, social presence, emotionality, and intimacy can be experienced when physical cues are absent or diminished in digital environments. If we can't see someone's face (which is often the case online), or touch a hand, or meet up for a date, can we really become intimately connected? As it turns out, people are quite creative when it comes to forming social connections and building social environments in which they do not physically interact or even see one another.

It seems strange to some that connections can form without the full benefit of external cues—without tactile or in some cases visual and aural information. Communication researcher Joseph Walther (1996), among others, has theorized exactly how people make sense of (and make social connections in) *cues filtered out* situations. He argues in what has been called the Social Information Processing theory that people who use their other senses and their limitless creativity to adapt their interactions accordingly and even without physicality can find out enough about one another to forge connections and potential intimacy.

People can learn quite a lot about others even if they only communicate textually. "Even with nothing but text, we can still tell a great deal about people from the language they use —their vocabulary, their grammar, their style," language and communication researcher Crispin Thurlow and his colleagues have found. "Besides, if we can't actually see social cues like age, sex and looks, we can always just ask… . This kind of direct request would seem pretty rude in [face-to-face] communication but it's considered acceptable in [computer-mediated communication]" (Thurlow, Lengel, & Tomic, 2004, p. 53; see also Baker, 2005). There are many ways to gather information about one another online, as we discuss in Chapter 6. People provide clues to their personalities in their nicknames, avatars, writing style, and in the design of their platforms and sites. In fact, when individuals go online with an eye toward possibly making a social connection, these kinds of fact-finding activities are among the first things they do.

Individuals can actually get to know one another *better* when their initial contacts are digital as opposed to face-to-face. They can like one another more and even gain a more accurate view of one another when visual cues are absent or reduced (Baker, 2005; McKenna, Green, & Gleason, 2002). Some people find the physical body to be a distraction and that in its absence they are better able to form honest, authentic relationships. "When we talk to someone in person," says psychologist Katelyn McKenna, "we pay attention to their subtle body language and facial cues that let us know how we are coming across. This fosters reticence in fully expressing our thoughts and feelings" (as quoted in Chayko, 2008, p. 46). Thoughts and feelings may be more easily, comfortably, and authentically shared when physicality is absent.

Some people communicate more freely about themselves in the absence of the physical. Put another way, the physical presence of a body can distract from the effort to get to know another person. Closeness, involvement, even attraction can be enhanced when people are not in one another's physical presence (Chayko, 2008; Hian, Chuan, Trevor, & Detenber, 2004; Hu, Wood, Smith, & Westbrook, 2004; Nowak, Watt, & Walther, 2005; Walther, 1996). A relationship can grow strong and intense even more quickly than when

the interactants have met face-to-face. In fact, online relationships can be even *more* intimate and personal than those conducted primarily face-to-face. Joseph Walther calls such relationships *hyperpersonal* (1997).

When people are in contact without being able to see or touch one another, they can become *disinhibited* (Suler, 2004; see also McKenna et al., 2002). Their inhibitions can be lowered and their behavior can become a bit (or a lot) more outgoing or daring. Disinhibition can be even more pronounced if individuals do not share their names or personal details online and are anonymous to one another. They may find themselves behaving differently than they would face-to-face—perhaps sharing personal information more quickly, even ill-advisedly, perhaps becoming thoughtlessly negative or nasty, perhaps becoming spontaneous, impulsive, wild.

Darkness, too, favors disinhibition. For many, face-to-face intimacies are more easily shared in darkness, especially late at night, than in the midday sun. They may feel less embarrassed, less self-conscious, than they ordinarily might. They may behave more freely and "open" themselves up more quickly, more intensely. Even in face-to-face copresence, some individuals avert their eyes when discussing something extremely personal and emotional or when they do not wish to be visually confrontational (Suler, 2004; Thurlow et al., 2004). In fact, people who meet in a darkened room tend to disclose more personal information to one another and even to like one another more than those who meet initially in the "light of day" (Gergen, Gergen, & Barton, 1973; McKenna, Green, & Gleason, 2002).

There are certain similarities to meeting in the dark and online. Reduced physical cues can replicate the openness and intrigue of darkness and nighttime. The absence of a physical presence can contribute to an environment in which information and intimacies are more easily shared. This can promote closeness and social connectedness.

Furthermore, digital and mobile media allow people to connect at odd times of the day or night and in odd places. This, too, is conducive to the development of intimacy. It is common to prefer to be in a private, out-of-the-way setting when sharing something very personal or private. There is something about finding someone else online in the middle of the night and reaching out to him or her that makes the moment a bit out of the ordinary and imbues it with specialness. This is similar to the "meeting on the train" phenomenon, in which people confide secrets to a total stranger whom they do not expect to ever see again simply because the setting lends itself to the sharing of intimacies. The repurcussions of such sharing may seem lower or be temporarily ignored (McKenna et al., 2002).

Technologies are continually being developed that approximate or reintroduce visual and sensory elements of the face-to-face experience to online or mobile connecting. The sharing of photos and videos has exploded in popularity on social media. But some still prefer the greater anonymity and clarity of text-based exchanges, especially for use in the early stages of relationships. Some shy away from using webcams in internet dating, psychologist Jeff Gavin has found, because they prefer to delay seeing their partners face-to-face. "There is something special about text-based relationships," he says (ScienceDaily.com, 2005).

Many of those whom I interviewed agreed. This thoughtful perspective came from a member of an intellectually rich and engaged online community:

> It could even be argued that we are engaging on a deeper level than we would be able to if we were face-to-face. A lot of things get lost and misconstrued in oral arguments. With this, everything is in writing. One often edits and rephrases for clarity. Putting things down in writing is far different than just blurting something aloud. Many posts only come after much reflection and a sorting out of thoughts. So although we miss the tones and facial expressions of the people with whom we are communicating, it could be argued that we are still communicating on a more profound level. (Chayko, 2002, p. 122)

Many people told me that there was something uniquely valuable and intimate about getting to know a person in a nonphysical sense before (or instead of) sharing physical space with them.

At a certain point, of course, to enjoy certain satisfactions people must meet face-to-face to share the full range of sensory experiences with one another—touch, smell, taste, physical nearness, bodily contact. Personal accountability is generally enhanced as well when people are face-to-face with one another. One concern about nonphysical connectedness can be put to rest, though, and that is the worry that internet-enabled relationships will somehow replace or substitute for face-to-face relationships. Rather, the online and offline tend to intersect and mesh in people’s everyday lives and be experienced as a blended whole.

The Intersection of the Online and the Offline

It is tempting, and quite common, to assume that what we do online happens at the expense of or displaces the offline (as detailed and critiqued by Boase & Wellman, 2006; Rainie & Wellman, 2012; Tufekei, 2010, 2012; and Wang & Wellman, 2010). Research paints a very different picture of how people use digital communication technology, however. Certainly, some people who are lonely gravitate toward the internet (Amichai-Hamburger & Ben-Artzi, 2003), and some become so immersed in their online connectedness that their well-being suffers (LaRose, Eastin, & Gregg, 2001; Morgan & Cotten, 2003). This is not the norm, however.

Most people utilize online connectedness to build, bolster, and give new dimension to face-to-face interactions and communities. They choose their online friends from among their offline contacts and use both mediated and face-to-face means to sustain all their relationships. As we explore in depth in Chapter 6, it is common for groups and relationships to exist in spaces that encompass both the online and the offline (see Ellison et al., 2009; Hampton et al., 2011; Haythornthwaite & Kendall, 2010; Rainie & Wellman, 2012). Online activities fulfill a wide range of needs, gratifications, and desires and are experienced as part of, not separate from, one's lived experience (see Baym, 1995, 2000, 2010; Jurgenson, 2012a, 2012c; Katz, Haas, & Gurevitch, 1997; Kayany, Wotring, & Forrest, 1996; Walther, 1996, 1997).

One's lived reality with technology is generally experienced as a blending, a mixture, of the online and the offline, rather than as one or the other (Baym 2010; Beer, 2008; Cerulo & Ruane, 1998; Floridi, 2007; Jurgenson, 2012c; Kendall, 2010). We do not tend to separate our lives into online and offline—or experience things as either digital or face-to-face. Social media theorist Nathan Jurgenson calls this separation *digital dualism*, and, as he and other thinkers have noted, it is both an artificial and unnecessary separation of realms that are actually enmeshed (2012c). While qualities and characteristics of the online and offline realms are surely different—a smile given or received in physical space is not at all the same thing as encountering an emoticon online, for example—the realms in which these experiences occur are not in opposition to one another. They are simply different aspects of lived experience that swirl around and intersect with one another, coagulating, in a sense, to become, simply, our realities—our lives.

Just as using new technological devices or platforms is usually confusing or clunky at first but becomes easier with time, digital technology tends to be integrated and folded into the everyday life of people in tech-rich communities and societies. This can happen so seamlessly that people can forget about or ignore the technology that has mediated the experience and simply focus on the experience itself (see Floridi, 2007; Rainie, 2006; Thomas, 2006). In doing so, they gradually adapt to those new technologies that become part of their everyday lives and become used to the way that their lives have become impacted and augmented by technology (Jurgenson, 2012c).

To consider the online and offline wholly separate spheres and engage in digital dualism is to also ignore or minimize their high degree of interpenetration. "It is because social media augments our offline lives (rather than replaces them) that research shows that Facebook users have more offline contacts, are more civically engaged, etc.," Jurgenson

argues, for “the online and offline are not separate spheres and thus are not zero-sum” (2012c). Indeed, offline activity fuels online content and expression; many individuals now spend significant time and energy considering how they may document online what may be happening in their lives offline (Jurgenson, 2012a; see also Ess, 2011). It should also be kept in mind that face-to-face interaction is not always inherently satisfying or best suited to every task (Calhoun, 1986). Obtaining and sharing information, resources, and certain kinds of support are often accomplished more effectively online than offline.

Those who have grown up immersed in the internet and digital media use may see the online and offline as melding seamlessly. Youth may be ushering in an era in which distinctions between the online and offline, and the real and the unreal, are becoming deeply blurred, if not obliterated. The worlds of young technology users bleed together, information technology professional Charles Grantham observes. “It is pretty useless to draw borders around different spheres of life for them” (as quoted in Rainie, 2006; see also Baym, 2000, 2010; Cerulo & Ruane, 1998; Ess, 2011; Ito et al., 2010; Thomas, 2006; Wilson & Atkinson, 2005).

Digital environments are so fully enmeshed with the physical world that one need not even be online to feel the impact. Even when spending time offline, perhaps enjoying a quiet, tech-free day in a natural setting, people can be influenced by their use of the internet and digital media. They may decide that they will document the experience with a photo (or several) that they plan to share later, mentally construct a status update they will later post on social media about the offline experience, or perhaps send a quick text message. Jurgenson calls this viewing the world with a “Facebook Eye”—thinking about how lived experience might translate to a future post, tweet, or update (2012a).

This kind of activity is common in a society rich in technology. Technology can be so deeply integrated with so many aspects of life that it is almost as though the tech has seeped inside the person, cyborg-style. And indeed to a certain extent, due to its frequent use, the tech *has* seeped in—mentally. The online–offline enmeshment is cognitive as much as it is experiential. In a tech-rich society, it may be difficult at times to truly “log off,” for the brain may remain “logged on.”

Because so many in technology-rich societies spend so much time and energy in digital environments, conceptualizing this experience is critical to understanding modern social life. As we have seen in this chapter, research on the experience and environments in which techno-social life takes place comes from numerous fields of study. I encourage you to bring *your* field of study, and your everyday understandings and knowledge, to bear on all of this. In your experience, how are digital environments evolving and changing and influencing social connectedness?

To make sure that our view on this is not myopic, though, we turn next to the topic of digital sharing and surveillance. It has become a norm to share information in digital spaces—often as widely as possible—even as companies and governments peek in on and collect and even sell this information. We shall see how these practices affect people’s ability to be private, to form relationships, and to have control over their lives so we can better understand and protect ourselves in superconnected, techno-social environments.

Note

1. Portions excerpted from Chayko (2014).

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