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1 MEDIA/SOCIETY IN A DIGITAL WORLD

LEARNING OBJECTIVES

After studying this chapter, you will be able to

1.1 Describe the prevalence of media today.

1.2 Compare the characteristics of interpersonal and "mass" communication and describe how the development of the internet has complicated these models of communication.

1.3 Outline the broader sociological perspective—specifically the concepts of structure and agency—that informs media and communication systems.

1.4 Identify and explain how the four core components of the media model interact with each other and the social world.

1.5 Document some of the push-pull dynamics involved in the civil rights struggles of the mid-20th century and the ongoing Black Lives Matter movement.

In the 21st century, we routinely navigate through a dense media environment. Our lives are saturated with words, pictures, videos, and sounds that we access through phones, tablets, laptops, televisions, streaming devices, radios, game consoles, books, and more. Not only are we audiences for this media content, we also circulate and create some of it through our social media posts, "likes," tweets, texts, video clips, online reviews, comments, and other activities. For most of us, we're so comfortable with media that we take them for granted. They are like the air we breathe, ever present yet rarely considered.

This book asks you to step back and reflect on important questions about the media environment in which we live. It invites you to better understand your media activities by placing them in a broader social, economic, and political context. In this book, we don't lecture about the "evils" of media, nor do we get caught up in the hype about the latest wonders of our digital age. Instead, we ask questions about how media work and why this matters:

- How have media technologies changed the way media operate?
- What can we learn about today's media by revisiting media from years past?
- How do companies like Google and Meta shape what we see—and don't see?
- How are traditional media companies—in print, radio, television, and film—still central to our media experiences?
- Why are some images and ideas so prevalent in the media, while others are marginalized?
- How do governments regulate media, and how does that affect media's operation?
- How does social inequality influence what we see in the media and how we use media?

- What is the significance of the ever-increasing globalization of media?
- What impact are media having on our society and on our world?

These questions and others like them are not simple to answer. Indeed, one of the arguments in this book is that popular answers to such questions often overlook the more complicated dynamics that characterize the media process. But these questions raise important issues we need to grapple with if we want to understand media's role in our society.

THE IMPORTANCE OF MEDIA

To realize the significance of media in our lives, consider how the range of media devices that surround us:

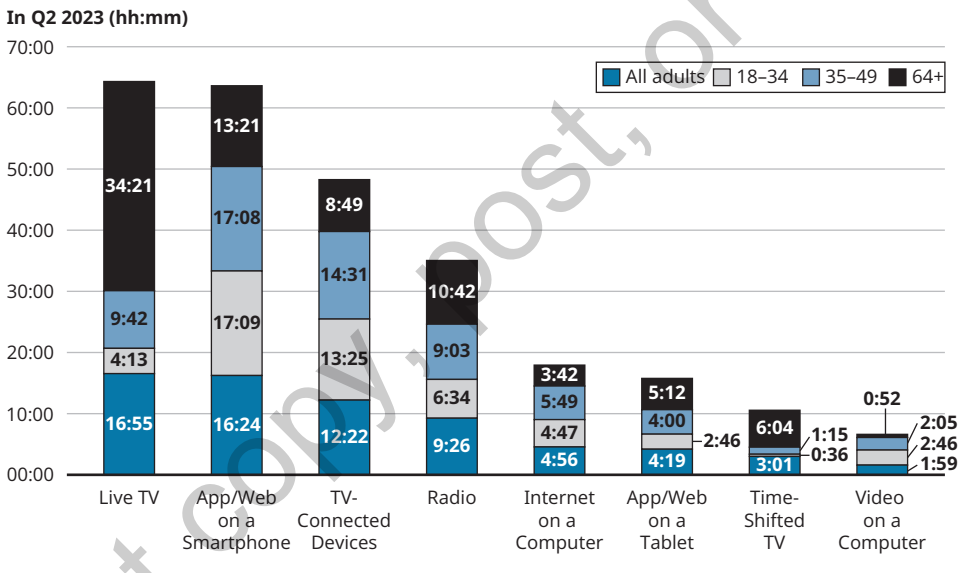
- Over 90 percent of U.S. adults own a smartphone, up from just 35 percent of adults in 2011. For 1 in 6 Americans, their smartphones are the only point of internet access in their homes (Pew Research Center 2024a).
- Teens, too, use media-related technology, sometimes at a higher rate than adults. For example, 95 percent of U.S. teens ages 13 to 17 have access to a smartphone at home, 90 percent of them have access to a desktop or laptop computer, and 83 percent have access to a gaming console (Pew Research Center 2023b).
- 82 percent of Americans age 12 and older listen to the radio in any given week, and about half of adults say they get news from listening to radio (Forman-Katz 2023)
- 97 percent of American homes have at least one television in them, and 70 percent have at least one smart TV that connects to the internet (Nielsen 2024a). In a typical month about 40 percent of television viewing is done over streaming, 25 percent is done through cable subscriptions and 20 percent is done on free over the air broadcasts. YouTube makes up over 10 percent of all streaming, with Netflix making over about 8 percent (Nielsen 2024b).

As users embrace new technology, they continually change the landscape of media devices. For example, the proliferation of smartphones led to the decline of landlines. More than 9 out of 10 U.S. households once had a landline; by 2023, only one quarter of U.S. households still had a landline (Van Dam 2023). The growth of smart TVs and video streaming services led to a steady increase in "cord-cutters," people who do not subscribe to traditional pay TV via cable, satellite, or fiber optics (Dawson 2017). Nonlinear subscription television is becoming increasingly prominent in U.S. households as Amazon Prime, Max, Hulu, Netflix, and so on provide a catalog of film and television options to audiences. Free advertising supported streaming television (called "FAST" channels) such as Tubi, Pluto TV, and The Roku Channel. Voice-activated "smart speakers," such as Amazon's Echo devices, are used for music streaming and their digital assistants (Consumer Intelligence Research Partners 2017). Increasingly, such

devices are becoming the household hub for the "internet of things" (IoT)—the network of internet-connected objects that enables machine-to-machine (M2M) communication—that link media devices with each other and with nonmedia gadgets.

All these media devices are an indicator of the enormous amount of time Americans spend using various forms of media. On average, Americans spend about 8.5 hours a day on digital media (Guttman 2023). As the American naturalist Hendry David Thoreau wrote in 1854, "The cost of a thing is the amount of . . . life which is required to be exchanged for it, immediately or in the long run." While digital media provides us with numerous benefits, spending over half our waking lives with it may come with costs too. With vast exposure to media at all ages, it can be argued that media are the dominant social institution in contemporary society, supplanting the influence of older institutions, such as schools, religion, and sometimes even the family.

FIGURE 1.1 ■ Weekly Time Spent With Select Media by Age Group in Hours and Minutes, United States, 2023



Source: Data from Marketing Charts 2024.

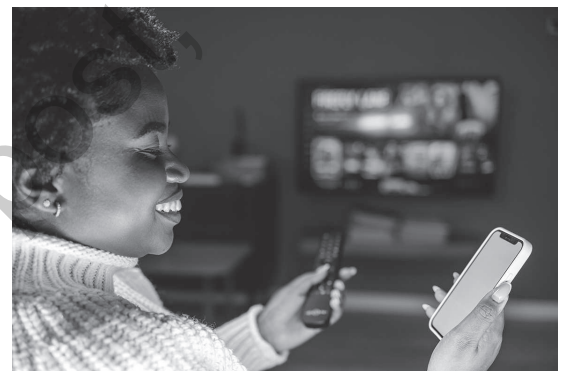
With the pervasive presence of media throughout our lives, media and society are fused: media/society. If that seems like a convenient overstatement from the authors of a textbook titled *Media/Society*, then consider this simple thought experiment: Envision life *without* media. Imagine that you wake up tomorrow in a sort of parallel universe where everything is the same except that media do not exist: no smartphones, internet, or social media; no videos, shows, or movies; no recorded music or video games; no books, magazines, or newspapers.

If media disappeared, nothing else would be the same. Our entertainment would be different. We would not watch sports on TV, game with our friends, or binge shows on Netflix. We would not post pictures or updates about ourselves—or look at others' posts—on social media

sites. Our understanding of politics and the world around us would be vastly different because we would not have websites, newspapers, radio, television, and books. Indeed, our world would be much "smaller" because we would know little beyond our direct experience. It would also be much "slower" because the pace of information reaching us would be greatly decreased. Even our perceptions of ourselves would be different because we would not have social media posts, television characters, and advertising images to compare ourselves against, for better or for worse. We might not concern ourselves so much with the latest fashions and celebrities if ads and social media posts did not imply that we *should* be concerned with such things.

With no media, we would have a great deal of time on our hands, and like earlier generations, we would probably spend much of it interacting with other people face-to-face. We might entertain ourselves by playing instruments or games. We might attend meetings and lectures or discuss politics and current events to learn what was going on. We might take up hobbies or learn new skills to pass the time. Our social lives—how and with whom we interact—would change radically in the absence of media. We would likely develop more intense local relationships while losing touch with people who are physically farther away.

Of course, changes would reach well beyond our personal lives. The behavior of politicians, business executives, and leaders in other fields would change without media. Presidents wouldn't post on social media, campaign ads wouldn't exist, and government would operate differently. Without advertising, business would be fundamentally different. Education, religion, and every other social institution would also be different without media, as would social movements and citizens' organizations. Our point is not that the world would be objectively better or worse without media. This isn't that type of book. Our point is that a world without media would be almost unrecognizably different.



We live in a media/society. Media are so central to our daily lives that we often use more than one form at a time.

Credit: iStock.com/Milko

So, yes, our media and society *are* intertwined in ways that make it difficult to imagine them ever being separated. In studying media, we examine a central feature of our society and our daily lives. But before we continue, let's consider a question that is not as simple as it seems: What are "media"?

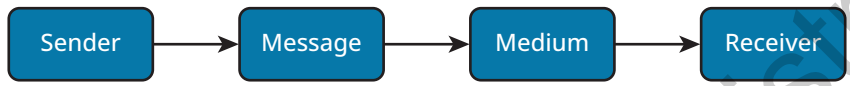
MODELS OF COMMUNICATION MEDIA

What are media? Answering this question has gotten more complicated as media have evolved. Let's clarify some terms and their significance by reviewing some basic communication models (McQuail and Windahl 1993).

Interpersonal and "Mass" Communication

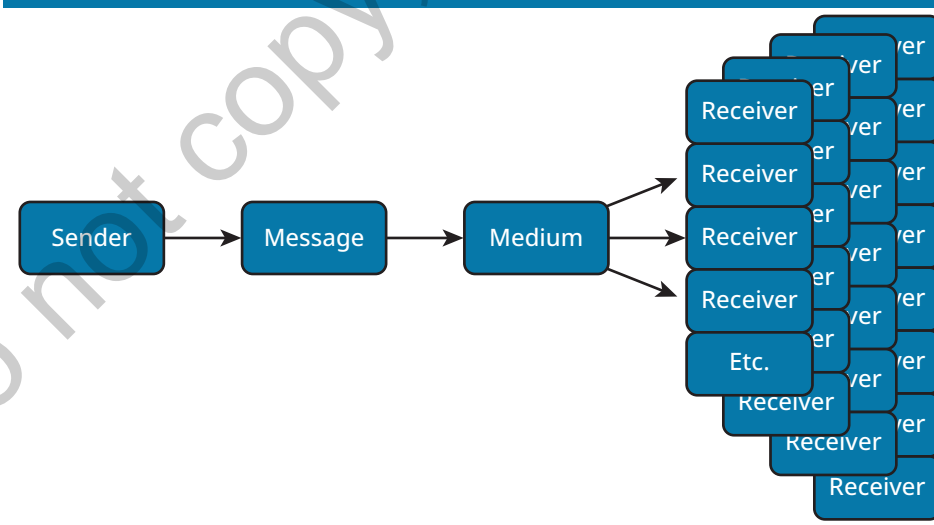
The word *media* (the plural of *medium*) is derived from the Latin word *medius*, which means "middle." Communication media are the different technological processes that facilitate communication between (and are in the middle of) the sender of a message and the receiver of that message (Figure 1.2). Print, telephone, radio, over-the-air and cable television broadcasting, film, and the internet are among the many types of media that exist.

FIGURE 1.2 ■ Basic Communication Media Model



This basic communication process applies to you talking on a cell phone to your friend. It also applies to, say, a radio station broadcasting a program to listeners. But crucial differences exist between these two types of communication. Your phone call is a one-to-one form of *interpersonal communication*; you are contacting a single person (in this case, your friend). By contrast, radio is a one-to-many form of *mass communication*; a station uses airwaves to send a radio signal to an unknown and potentially mass audience (see Figure 1.3). Various mass media involve a known sender and generally anonymous receivers. For example, readers typically know who the author is of the book they are reading, but authors clearly cannot know who, exactly, reads their book. When we watch a TV show or go to the movies, the names of the producer, director, and actors are displayed, whereas the audiences are unknown to the creators.

FIGURE 1.3 ■ Traditional Mass Media Model



Furthermore, your phone conversation is likely to be highly interactive, featuring a back-and-forth dialogue; you are both a producer and receiver of messages. Unless it incorporates a different medium—as with call-in programs—a modern radio broadcast is not interactive; media personnel send a "message" out to an audience. These one-way communication channels create a clear distinction between producers and receivers of media content. With traditional mass media, the producers of most content are professionals in commercial companies, nonprofit media organizations, and governments, whereas members of the public are limited to being in the audience. Audiences have always been active in "reading" or interpreting mass media content (something we explore later in the book), but traditional mass media allow for only very limited interaction between the sender and receivers.

So the distinctions between interpersonal and traditional "mass" media are fairly clear. Personal communication tends to (a) be one-to-one, (b) involve a single known receiver, and (c) be very interactive. Traditional mass media tend to (a) be one-to-many, (b) involve a potentially large and unknown audience, and (c) feature limited, if any, interaction. But today such distinctions have eroded.

Variable Boundaries and Active Users

A few decades ago, our discussion of communications models would end with the distinction between interpersonal communication and mass media. However, the development of the internet blurred the lines between the two, enabling users to play different roles if they choose. For example, you can use the internet to send an email to someone you know—a regular one-to-one personal communication. But you can also post a video on YouTube or TikTok that could potentially go viral, reaching a mass audience.

So what is the internet: interpersonal communication or mass media? Clearly, it's both. The fact that the internet encompasses nearly all forms of communication is a big part of what made it a game-changer. As we see later in the book, the variable boundaries between private interpersonal communication and public mass communication were an important change that produced a number of issues we still grapple with today.

In addition to blurring boundaries between private and public, the internet enabled people to be much more active, more easily, than they could with traditional media. Today, we can be *users* of media—the term we favor in this book—rather than merely receivers or audience members. With the internet, media users can be more active in the following ways:

- Choosing *what* media content they access from a range of choices that is broader than ever
- Deciding *when* they will use media rather than being dependent on scheduled broadcasts (e.g., via streaming)
- Sharing, promoting, and distributing media content (e.g., liking something on Instagram)

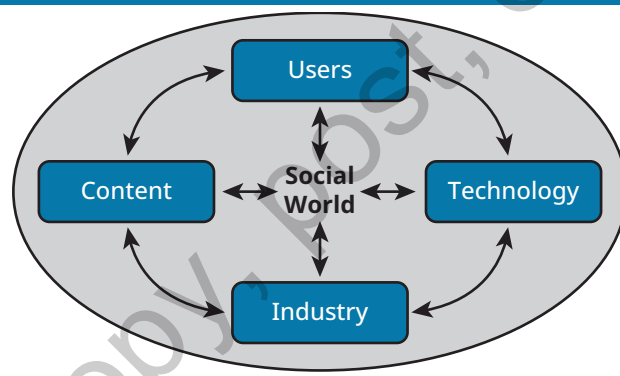
- Responding to and commenting on media content (e.g., using a website's comments section)
- Creating their own media content (e.g., social media posts, uploaded photos and videos, Yelp reviews, blog posts, and podcasts)

With this level of user activity, traditional mass communication models—showing merely "receivers" of a message—fail to capture the dynamic interplay that potentially exists between the media industry and nonprofessional media users. By adopting the term *user*, we intend to encompass this full range of activities.

Communication Today: A First Look

So how can we summarize today's communication in a simple media model? In this book, we use the model in Figure 1.4A, which we explain in more detail later in the chapter. For now, let's note some of the elements that have changed from the traditional models:

FIGURE 1.4A ■ Simplified Model of Media and the Social World



- The four primary elements of the model have changed:
  - *Industry* replaces *sender* to flag the professional and usually commercial nature of media organizations responsible for most media content.
  - The term *content* replaces *messages* to better reflect the wide range of media subjects as experienced by users.
  - *Technology* replaces *medium* to isolate the material elements of media.
  - *Users*, who both actively consume content created by industry professionals and create their own content, replace *receivers*.
- The entire model is embedded within a vital new element—the social world—which includes a variety of social forces and nonmedia actors that affect the communication process, such as cultural norms and government regulation.

- All the arrows that indicate contact between elements in the model are double headed, reflecting the potentially interactive nature of media.
- Finally, because users are more active than in the past, our contemporary media model is circular rather than linear. This suggests the endless feedback loops that occur among these components.

It is this more dynamic and sociological model of media that underlies this book.

The media world described by this model includes both "traditional" mass-media *and* internet-based communication. For a time, observers distinguished between these two by referring to them as "old" and "new" media. However, as we explore throughout this book, they have blurred together in many ways. The internet, it turns out, is in many ways very similar to older media, and as popular podcasters, YouTube celebrities, and Instagram influencers professionalize, it is even increasingly so.

A SOCIOLOGY OF MEDIA

Sociologists are not the only ones who study media. Political scientists are sometimes interested in the media's role in politics. Literary scholars might examine the media as cultural texts. Some psychologists are interested in media's effect on individual behavior. Media studies and communication scholars explore a range of media issues that often emphasize how media institutions work.

The lines between the different approaches to the media are rarely clear. It is common to see references to sociological theories and concepts in the communications literature. In fact, some communications scholars were trained as sociologists before turning their attention exclusively to the media. In turn, sociologists draw on the work of media studies and communications scholars. But although they can overlap, there is a difference between these disciplines. The field of media or communications studies is defined by a particular substantive area of interest, whereas sociology is a perspective that is applied to a wide range of substantive areas, including the media. Not all sociologists study the media, and not all communications researchers use a sociological perspective.

Throughout this text, we draw upon classic and contemporary media research that implicitly or explicitly employs a sociological perspective. A sociological perspective also informs our organization of this text, which emphasizes the interactions among the elements of our media model and the larger social world. Before we explore that specific model in more detail, let's consider the broader sociological perspective that informs it.

The Sociological Perspective

At its most basic level, a *sociological perspective* encourages us to focus on relationships between individuals and the broader social context in which they live (Croteau and Hoynes 2019). Collectively, people have created the social world, and in turn, they are influenced by it. For

example, students make "personal" decisions about attending college. However, a sociological perspective reminds us that our society features an economy (in which higher education is required for many occupations), a dominant culture (in which formal education is highly valued), a government (which maintains public universities and offers funding for some—but not all—students), families (who often encourage children to attend college), and even the media (which often features positive portrayal of graduates and commercials for for-profit colleges). All of these social forces combine to make the desire to attend college not really even feel like a "personal" decision at all. Thus, students do not make decisions about college in a vacuum; they are affected by the social context in which they live. A century ago, the percentage of young people "choosing" to go to college was much less than it is today; the social context of the time—including its even more limiting race, class, and gender-based barriers—influenced individual opportunities for actions in radically different ways.

More broadly, the individual is a product of social interaction to varying degrees. The language we use, the education we receive, and the norms and values we are taught are all part of a socialization process through which we develop and embrace a sense of self. We become who we are largely through our social relations with others.

Furthermore, our daily activities usually take place within the context of groups and institutions. Family, friendship circles, school, teams, work, community—these are the collective contexts in which we develop our roles and identities as kids, friends, students, athletes, employees, citizens, and so forth. Each role brings with it a set of expectations about our actions; being a "good" student, employee, or friend usually involves conforming to those expectations. In this way, too, sociology teaches us that, to understand people's actions, you must consider the larger social context in which they occur. That's because, although people collectively create the features of society—families, government, schools, and so on—those creations in turn influence how people act.

Our concern here is with media, not college attendance or the general socialization of individuals, but the principle is the same. To best understand media, we need to see it as a social institution comprising various elements that constantly interact. Furthermore, to understand this media system we need to put it in the larger context of the social world. This enables us to better see how media relate to other actors and social institutions as well as how media influence this larger social world. This push-pull interaction between elements of our model reflects sociology's broader interest in the role of structure and agency.

Structural Constraint and Human Agency

Sociologists often link discussions of interaction and social relations to the concepts of structure and agency. In this context, *structure* suggests constraint on human action, and *agency* indicates independent action. The push-pull interactions that result from structure and agency are essential to understanding social life, the media included.

Structure

Structure is not something physical. In the broadest sense, social structure describes any recurring pattern of social behavior. For any individual, the weight of social structure can be

experienced as "pressure" from an unnamed source to think, act, or behave in a particular way. For example, we can talk about *family structure* as a pattern of behaviors associated with the culturally defined idea of family. The "traditional family" is actually a quite recent and geographically specific phenomenon (Coontz 2016). During the post–World War II years in Western countries, the "traditional family" usually meant married, heterosexual couples with children. In such relationships, the expected role of the wife was to work at home raising children, especially in white, middle-class families. The expected role of the husband was to work for income to pay the household bills.

When sociologists speak of a change in family structure, they are referring to the changes in the pattern of expected family behavior. Traditional expectations that a family include two parents, that the parents be married, that they be heterosexual, that a woman work only in the home, and so forth, have changed dramatically. Single-parent families, blended families, two-income families, unmarried couples, child-free couples, gender-nonconforming couples, and same-sex couples, to name a few, have supplemented the traditional family. The family structure—the pattern of behavior associated with families—has changed.

The traditional family structure was an attractive one for some people. It enabled them to fit neatly into clearly defined roles that brought them rewards. Husbands and children were usually nurtured and cared for. Wives often enjoyed autonomy to make choices in the home. These are examples of how structures can be enabling; they help people achieve something. However, this structure also limited the options of many people. It constrained their behavior by encouraging or coercing them to conform to the accepted standards of family-related behavior. For example, wives were denied the opportunity to use their skills outside the home in paid employment, whereas husbands were denied the experience of participating significantly in raising children. These are examples of how structures can be restrictive or even coercive; they deter people from doing something.

Agency

When sociologists discuss structure, they often pair it with agency. Agency is intentional and unforced human action. Human agency reproduces—or sometimes changes—social structure. The traditional family structure continues only as long as new generations of people accept the roles they are asked to fill within it. Most of the time, that's what our actions do; they help reproduce existing social structures. But when enough people began to demand the right to choose from a wider set of possible family roles, including women having a career outside the home and same-sex couples being legally recognized, the traditional family structure began to change. While structure constrains agency, it is human agency that either alters or maintains social structures.

Structure and Agency in the Media

With respect to the media system, the relationship between structure and agency is present on at least three levels. We can express these three levels of analysis as three pairs of questions about structural constraint and agency.

- **Relationships among institutions.** How do social structures, such as government and the economy, affect the media industry? How does the media industry influence other social structures?
- **Relationships within an institution.** How does the structure of the media industry affect media personnel and, indirectly, media content? How do media personnel influence media content and media organizations?
- **Relationships between an institution and the public.** How does the media industry influence the users of media? How do the choices and actions of media users affect the media industry?

One reason why media are often controversial is that different groups expect the media to play different—and often incompatible—roles. For users, the media can serve as the source of entertainment and information about the world beyond direct experience. For advocates of various sorts—from advertisers, to politicians, to social movement organizers, are vehicles for transmitting messages they want others to be exposed to; they hope the media will change users' beliefs in their favor, or even better, guide users' actions. For media workers, the media industry offers jobs, with resulting income, prestige, and satisfaction, as well as a place for the development of a professional identity. For media owners, the media are a source of profit and, perhaps, a source of political power. For society at large, the media can be a way to transmit information and values (socialization) and can serve as a check on the abuse of political and economic power. By considering structure-agency dynamics, we can see the tensions between these sometimes divergent roles.

Relationships Between the Media and Other Social Institutions

First, our broadest level of analysis is the tension between structure and agency produced by different institutions. We cannot adequately understand the media system without considering the social, economic, and political context in which it exists. Institutions outside the control of media personnel set legal and economic limits within which the media industry must operate. In turn, the media industry has agency in the sense of acting on its own and perhaps influencing other social institutions. A totalitarian regime, for example, is likely to exert extreme constraint on the press in that society. There would be little room for agency by the mainstream news media, although outlawed underground media may emerge to challenge the status quo. Labeling a society *democratic*, on the other hand, includes the suggestion that, at least in theory, the media are free of severe constraint by the government and thus have significant agency. Indeed, media in democratic societies can themselves exert a constraining influence over other institutions. However, media in democratic societies are often commercial ventures and so are subject to influence and limitations placed on them by corporate owners.

In the real world, there is always a mixture of structural constraints and independent agency. Media researchers, therefore, examine both how social structures external to the media affect the industry and how the media affect other social structures. This level of analysis includes questions such as these: Should the government regulate social media companies? Have economic changes threatened the existence of journalism? Does it matter who owns major media outlets? How have algorithms and generative AI changed the media landscape?

Relationships Within the Media Industry

Second, to understand the decisions made by journalists, writers, producers, filmmakers, media executives, and other media personnel, we must understand the contexts in which they work. This means that we must be familiar with both the internal workings of mass media organizations and the processes of professional socialization. The sociological emphasis here is on social positions, roles, and practices, not on particular individuals. Relevant issues of concern include the structures of media institutions, those who wield power within them, what professional norms and expectations are associated with different positions, and so forth.

Within the media industry, the tension between structure and agency is related primarily to how much autonomy media personnel have in doing their work. The amount of autonomy will vary depending on the position an individual occupies, as well as the industry and media organization in which they work. The questions raised include the following: To what extent do standard journalistic practices shape the process of news reporting or the content of the news? How do economic considerations enter into the decision-making process of Hollywood moviemaking? How "free" are musicians to create their music? How have media platforms like X influenced the norms and routines of commercial news media? In the language of sociology, structural considerations may significantly affect the individual agency of media personnel. At the same time, the collective agency of those who work in the media has the potential to alter the structures that constrain individual media professionals.

Relationships Between the Media and the Public

A third kind of social relationship involves how media content and technology potentially influence users and, in turn, how media users can impact the media industry and the content it produces. Media users are not passive sponges that soak up the messages they come across in the media. This would imply a one-way relationship with the media determining the thoughts and behaviors of users. Instead, as we noted, media users are often active on several fronts: choosing *what* media content they will use and *when* they will use it; promoting, redistributing, criticizing, or ignoring content; and even creating their own content. Media users also interpret media messages through their own social lenses; they are active "readers" of media content.

When we interpret the words of someone speaking with us face-to-face, we interactively construct the conversation. We can elicit more information from the speaker by asking a clarifying question or use facial expressions to convey our reactions. We can comment on statements and thereby affect the course of the conversation. Such interaction between speakers helps promote mutual understanding about the messages communicated.

Media content, however, usually does not allow for the intimate interaction of sender and receiver that characterizes interpersonal communication. We cannot ask a stand-up comedian on TV to explain a joke. We either get it or we don't. It's unlikely that a question we pose on X to our favorite musical artists will be answered. Media users, therefore, must rely on other resources to make sense of the messages in media content.

Relevant resources available to users might include knowledge and information gained from personal experience, other people, formal education, or other media content. These resources are neither randomly nor equally distributed. The interpretive lenses that people bring with

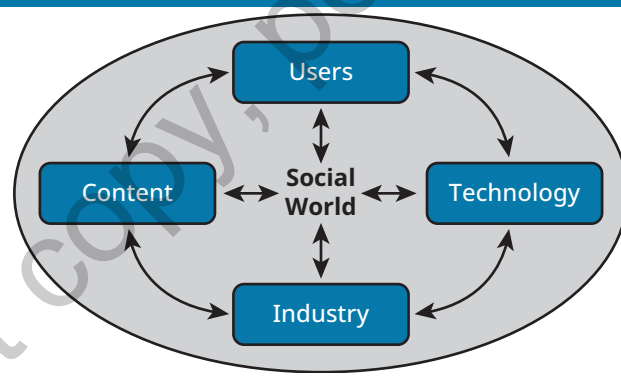
them to their viewing, listening, and reading are shaped by aspects of social structure, such as class, race, gender, and education. Thus, in constructing their own interpretations of the media, people draw on collective resources and experiences that are shaped by social factors.

Active users are important, but the thousands of hours people spend with media do have some influence on them. Users are not completely immune to the impact of media content and media technology. Here too, we have to explore the dynamic interplay between the power of social structure and the (always partial) autonomy of human activity. How powerful is media content in influencing how we think, feel, and even behave? For example, does racist internet content embolden people to be more overtly racist? How does media technology affect our social relationships? Do smartphones undermine or enhance face-to-face communication? How do the algorithms that drive search engine results affect how people use the internet? Ultimately, these are complex questions that do not lend themselves to easy answers involving all-encompassing media power or complete individual freedom. Instead, we need to pay attention to the push-pull relationships between structure and agency throughout the media system if we are to understand the role of media in the social world.

A MODEL OF MEDIA AND THE SOCIAL WORLD

How can we begin to make sense of the complex relationships we have identified? Let's return to Figure 1.4b and examine our simple graphic representation of these relations in more detail.

FIGURE 1.4B ■ Simplified Model of Media and the Social World



Four components, each represented by a separate box in the diagram, make up the core of our model. All four elements are simultaneously a part of the social world and surrounded by the social world (the shaded area). The graphic organization of these four elements is arbitrary; there is no "top" or "bottom" to the process; rather, it is a circular process. Double arrowheads represent the potential relationships among the components, although not all relationships are relevant in all situations. We will first describe the elements represented by the four large boxes and then turn our attention to the unique status of the *social world* (represented by the shading), which is both in the center of the model and simultaneously surrounding it.

The box at the bottom of the model represents the *media industry*, by which we mean the entire organizational structure that makes up the media, including all media personnel. The media industry is affected by changes in *technology* (e.g., the transition to streaming) but is also instrumental in influencing the direction and application of technology (e.g., the use of computers for film animation). The media industry is the producer of media *content*. For example, a book is written by an author, designed, typeset, printed (or formatted as an e-book), distributed by a publisher, and sold, either physically or electronically. However, the conventions of particular genres of media products also influence the creators of the content. The murder mystery genre, for example, requires the existence of a crime.

Users may be influenced by the media content they see (e.g., learning about an impending snowstorm from the weather report), but they must actively interpret and construct meaning from that content (e.g., deciding whether to trust the forecast and act differently as a result). Sociologists call the process of actively creating meaning in this way the *social construction of reality*. This means that, although reality exists, we must negotiate the meaning of that reality. A student who sports a series of prominent tattoos is an objective reality. However, different people interpret such body art in different ways. Is it a sign of conformity to a fad? A rebellious statement? A snubbing of mainstream norms? A mutilation of the body? An act of personal expression? The meaning of the tattoos must be constructed by those observing them. The same is true for the meaning of messages in media content. That is one reason why users—who must "read" and interpret media content—are such an important part of the media process.

As we have noted, users always had the capacity to respond to the media industry, for example, by writing a letter to a television network. But the internet has enabled much more active media users. In fact, "users" sometimes take on roles that used to be limited to the "industry," such as creating content to be widely distributed. Our simple model doesn't explicitly show this blurring of roles, but it is a dynamic we discuss throughout the book.

The direction and development of technology is affected by how the *users* choose to use it—or not to use it. Google Glass—a computer headset worn like a pair of glasses—generated curiosity when it was introduced in 2013, but users did not embrace the technology, forcing Google to withdraw the product. In turn, technology has a potential impact on the public. For example, movie viewing usually requires close attention because the medium communicates via both sound and images. This contrasts with audio-only media, such as music streaming, which does not demand our full attention. Unlike movies, which we must both watch and listen to if we want to fully follow, music streaming allows us to do other things while still attending to it, such as drive, exercise, or cook. Each medium, therefore, tends to produce a different experience for users. This is one effect of technology.

The middle—and broader context—of the model is the *social world*. This contains all the social elements not included in the four main boxes. Some of these elements are crucial for an understanding of the workings of the media and thus can be thought of as being at the center of the model. For example, the role of government and broader economic forces are nonmedia social factors that influence all the elements of our model.

Notice that the top and bottom elements of our model include human agents—real people—whereas the left and right boxes are human creations. People are the medium through

which media content and technology affect each other. Similarly, the relationship between the media industry and most media users is mediated by content, technology, and other factors in the social world. Note, too, that any single component of the model simultaneously relates to other components. For example, media content is simultaneously influenced by the media industry that creates it and the users who access or ignore, interpret, share, and critique it as well as by other aspects of the social world, such as government regulation.

Our simplified model is meant to identify some of the key components in the sociology of media and to clarify some of the relationships among these components. Like all models, it cannot fully account for the infinite complexities of the "real" social world. However, applying the model to analyze the media can alert us to important questions and help us clarify the workings and social significance of mass media.

APPLYING THE MODEL: CIVIL RIGHTS IN TWO MEDIA ERAS

To illustrate briefly how the model can alert us to important real-life issues, consider the U.S. civil rights struggles of the 1950s and 1960s (Branch 1988; McAdam 1982; Morris 1984) and the ongoing Black Lives Matter movement that began in the mid-2010s (Ray, Brown, and Laybourn 2017). These movements took place in two different eras, and so their interactions with media varied significantly. We can think of these social movements as part of the nonmedia social world insofar as they exist independent of our four media model components. For the moment, imagine each movement as being the element of the social world that occupies the center position in our model.

Mid-20th-Century Civil Rights Movement

In the mid-20th century, the civil rights movement launched a series of nonviolent direct-action campaigns to challenge the injustices of U.S. racial segregation. These campaigns, which were mostly in the South, sometimes were met with violence from segregationist counterdemonstrators and police. Often, these confrontations attracted media coverage, which helped raise awareness about racial injustice among mainstream, mostly white, Americans.

Our media model can be used to consider some of the push-pull dynamics involved in this effort. Let's work our way around the model components:

- **Industry-content.** The media industry created content featuring the civil rights movement; in turn, journalists were constrained by the genre norms of "news" coverage at the time. For example, reporters typically wrote stories about the movement to fit the journalistic convention of a balanced presentation of facts, including quotes from counterdemonstrators. Generally, journalists also performed their roles as independent observers by not offering their personal opinions about what was happening.
- **Content-users.** The media content about the civil rights movement affected many media users, who in turn were interpreting the meaning of those messages. For example, some supporters in the North were moved by media accounts to make

financial contributions to movement organizations in the South or even to volunteer for movement efforts. In contrast, others sympathized with the forces of segregation, often seeing civil rights activists—and the media organizations that covered them—as troublemakers. The media content had an impact, but media users could interpret the meaning and significance of the messages in distinct ways.

- **Users-technology.** Media users of the 1950s and 1960s relied on technology, especially print, and recently introduced television, to access media content. Meanwhile, technology may have indirectly influenced users, with the immediacy and impact of television footage of police violence against demonstrators.
- **Technology-industry.** Technology was also helping change the media industry; the availability of lighter, handheld cameras allowed reporters more mobility to file "on-the-scene" stories that would not have been possible earlier. Journalists often used this technology to capture dramatic clashes during demonstrations. Television footage of police using firehoses and unleashing dogs on demonstrators became iconic images that are well known even today.

Now, let's move to the center of the model, where the movement itself was a part of the social world interacting with the media process.

- **Movement-industry.** The movement's tactics of escalating nonviolent confrontation made it more difficult for the media industry to ignore their cause. Segregation was not new, but now the movement's efforts drew the attention of national news organizations that had long defined civil disturbances as newsworthy. In the long term, the civil rights movement had additional impact on the media industry (and other social institutions) by helping reduce its discriminatory practices in hiring and promotion. The racial diversity that exists today in the media industry—even though limited—would not have come about without the influence of this social movement and the resulting changes in legislation and social norms. However, the media industry also had an impact on the civil rights movement. In this era, the only way a movement could reach a large and broad audience was through mainstream media coverage. Consequently, social movements often crafted strategies to attract such coverage, such as staging marches and demonstrations. By altering their behavior to fit media norms and routines, social movement activists were affected by the media industry even before the media produced any coverage of the group.
- **Movement-content.** Media content affected the civil rights movement as it tried to develop favorable media coverage and, in some cases, altered strategies to minimize negative coverage. The movement did not affect media content directly but instead did so indirectly by trying to influence journalists covering the movement. In the long term, it also affected the industry as a whole and the content it produces. A media industry that employs more people of color in positions of power, for example, is more likely to be sensitive to race issues in its content.

- **Movement-users.** The civil rights movement was trying to get citizens—who were media users—to support their efforts. Thus, the movement had an indirect influence on users through the content to which they were exposed. In the long term, the movement also had a direct impact on media users because the presence of the movement meant more social equality. At the same time, media users have sometimes acted in their role as citizens to support social movement efforts, illustrating the interaction between these two components of the model.
- **Movement-technology.** The technology of the 1950s that the civil rights movement relied on to communicate its messages seems ancient by today's standards, but it was an integral part of the ongoing organizing effort, both enabling and constraining what could be done. Because they had little or no access to television and radio, movement organizers relied on print for nearly all their work. For example, if a leaflet announcing a meeting needed to be distributed, stencils might be cut for hand-cranked mimeograph machines often owned by Black churches. Black-owned newsletters and magazines were a source of movement information. By today's standards, these sorts of print media were very slow in spreading news, but they enabled the movement to build systematically and expand their base. Once the movement began growing, it staged larger demonstrations that drew the attention of mainstream media, helping spread their message.

Even in this cursory summary, the usefulness of our model for investigating issues related to the media is apparent. But what happens when the media environment changes? Do the kinds of dynamics described here still apply? Another brief case study can illustrate the enduring relevance of these dynamics.

Black Lives Matter Movement

A half century after the peak of the civil rights movement, the Black Lives Matter (BLM) movement emerged in protest of the killing of Trayvon Martin. Over time, BLM expanded to address broader issues of systemic racial injustice, as a variety of decentralized efforts sought to draw attention to—and ultimately address—contemporary structural racism. Important changes in the media industry and technology mean that BLM has operated very differently from the civil rights movement. But the elements of our media model remain just as relevant in understanding these new dynamics. We won't repeat many of the features that BLM shares with the earlier civil rights movement. Instead, we'll note a few of the major differences that exist.

First, BLM has taken full advantage of new media technology, which transformed the role of some media users. BLM emerged from a then-Twitter hashtag (created by Alicia Garza, Patrisse Cullors, and Opal Tometi in July 2013), so from the beginning it was activist-users who were creating media content that reached both their supporters—who often helped circulate this content—and the broader world of nonactivist media users. As street demonstrations emerged, BLM activists often live-streamed events or posted video highlights to social media platforms—video that sometimes went viral and was picked up by mainstream news outlets.

Unlike previous generations of activists, BLM activists were less dependent on mainstream news media to get out their message. Instead, not only movement activists but even regular social media users could disseminate videos of police violence as well as coordinate fundraisers for victims. For example, in 2020 use of the BLM hashtag on what was then Twitter dramatically spiked after the killings of Ahmaud Arbery, Breonna Taylor, and George Floyd, ultimately leading to mass public demonstrations around the world. Traditional news coverage still mattered a great deal in shaping mainstream media users' understanding of the movement, but the movement itself could use social media platforms to get out sometimes different and unfiltered content quite broadly. This was done in real time, dramatically speeding up the process of growth for the movement. Such rapid growth can be impressive but also challenging, thrusting the movement onto a national stage before a clear agenda, leadership roles, and organizational structures have fully developed (Sands 2017; Tufecki 2017).

Second, the media industry was vastly different in the 21st century from what it was in the mid-20th, affecting coverage of BLM. With the earlier civil rights movement, there were only three national television networks in the United States, each creating one nightly news broadcast that was seen by vast swaths of society. With BLM, the earlier rise of cable TV and the internet had created highly fragmented news audiences spread across many outlets. In the 2010s and 2020s, these outlets offered breaking news and commentary 24 hours a day that often incorporated dramatic videos of protest events. These many channels hosted lengthy and often partisan discussion and debate about the merits of the movement.

In part because they do not have regular access to the mainstream media, many social movements must adopt tactics that attract attention and increase their chances of gaining media exposure. A common strategy is the public demonstration, featuring eye-catching signs, props, and chanting.

Credit: Warrick Page/Contributor/Getty Images News/via Getty Images

So compared to the civil rights movement, BLM's emergence in the digital age meant the following:

- New *technology* could be employed to gather and share *content*, often in real time.
- Some media *users* could play a more active role in creating and sharing this content; mainstream users, though, were divided into fragmented audiences seeing and reading very different types of coverage of the movement.
- The media *industry* was structured to produce more and quicker coverage across numerous outlets.

Although the particulars of this movement had changed from the earlier one, the basic elements of our media model remain as relevant as ever in alerting us to important social dynamics. This illustrates the utility of a sociological approach to understanding how media interact with the social world, regardless of the historical era.

CONCLUSION

It is difficult to overestimate the importance of media in today's society. But it is hard to think analytically about a system that is so vast, pervasive, and complex. A sociological approach to the study of media encourages us to pay attention to key elements of the media process and to locate media in a larger social context. That's what we do in the model of media and the social world presented in this chapter. This model is the underlying framework for the rest of the book, helping us identify questions we should ask when we study the media. The upcoming chapters focus on the push-pull relations among components of our model—technology, industry, content, and users—as well as the broader social world. Examining the relationships among these key elements is the first step toward developing a nuanced understanding of the role of media in our society.

DISCUSSION QUESTIONS

1. What evidence is there that the media play a significant role in your life? Do you have access to many of the devices mentioned in the chapter? Does your daily routine involve using media?
2. How does the presence of media affect your life? How would it be different without access to media? What aspect of media would you miss the most? Why?
3. What is meant by the terms *structure* and *agency*? What is a media-related example that shows how the two concepts are connected to each other?

PART II

TECHNOLOGY

In Chapter 2, we survey how media technology has evolved from the creation of print to the evolution of the internet. We highlight the distinctive features of each new technology and how they might have enabled significant social change. We also consider how social forces helped shape these technologies in unexpected ways.

Credit: Busakorn Pongparnit/Moment/via Getty Images

2 THE EVOLUTION OF MEDIA TECHNOLOGY

LEARNING OBJECTIVES

After studying this chapter, you will be able to

2.1 Pinpoint significant developments in the history of media technology.

2.2 Identify variations of technological determinism.

2.3 Describe the features of social constructionism.

2.4 Document the tension between technological determinism and social constructionism as new media technologies emerged from print through television.

2.5 Describe the birth, growth, and characteristics of the internet.

From printed paper to digital screens, technology underlies all systems of mediated communication. In this chapter, after briefly reviewing the history of media technology, we examine scholarly approaches to understanding technology and then use some of these ideas to explore the evolution of media technologies. As we will see, each technology is influenced by social forces, including how the media industry elects to deploy it, whether and how users choose to adopt or adapt it, and whether and how governments opt to regulate it. Together, all of these elements—which are components of the media model from Chapter 1—make up technology's story.

THE HISTORY OF MEDIA TECHNOLOGY

One way to tell the story of media is through the history of its technology (Brigs and Burke 2009; Kovarik 2016). For most of human history, communication was conducted face-to-face. Then, centuries of one-of-a-kind creations followed, including artwork on cave walls, carvings in stone, and marks on papyrus. Along the way, humans invented numbers and written language. But it was not until the invention of paper in China around the year 100 CE and printing 500 years later, that communication using a medium began to be reproducible. By about 800 CE, book printing began, using a single, carved wooden block to reproduce each page. For the first time, technology enabled the preservation and distribution of human thought to others through the creation of copies.

For 1,000 years print *was* media technology (see Figure 2.1). However, 19th-century industrialization drastically increased the pace of technological innovation, bringing the telegraph, camera, telephone, phonograph, radio, and motion pictures in rapid succession. In the 20th century, these media—along with television and the internet—were developed into the industries we know today. Technology in the 21st century has enabled social transformations by integrating digital multimedia platforms into all aspects of our lives and by making media-creating technology more accessible to ordinary users.

FIGURE 2.1 ■ Timeline of Select Media Developments

Year	Media-Related Advancement
100	Papermaking is developed in China
600	Printing using carved blocks of wood begins in China
800	First books are printed in China, using a single wood block for an entire page of text
1000	Movable clay type—with one piece of type for each character—used in China
1200	Movable metal type developed in Korea
1450	Hand-operated printing press with movable type is developed in Germany
1600	First newspapers appear in Germany, France, and Belgium
1700	1702 London's *Daily Courant* becomes the first English-language daily newspaper
1800	1837 Electric telegraph is patented 1839 Early photographic camera for commercial sale is introduced
1850	1876 Telephone is patented 1878 First practical sound recorder and player is patented 1894 Motion pictures are invented and the first short films are shown to the public 1895 Radio messages are first transmitted
1900	1920 Regularly scheduled radio broadcasting begins in Pittsburgh 1927 *The Jazz Singer* is the first feature-length film with synchronized speech 1937 First digital computer is created from telephone parts 1941 First commercial television is broadcast 1946 Mainframe computer is invented 1948 Early cable television captures and retransmits local broadcast programs via wires in areas with weak signals 1949 Network television broadcasting begins in the United States
1950	1957 First communications satellite, *Sputnik*, is launched by USSR 1961 Modern cable TV begins 1969 First nodes of the internet created as part of a Pentagon program

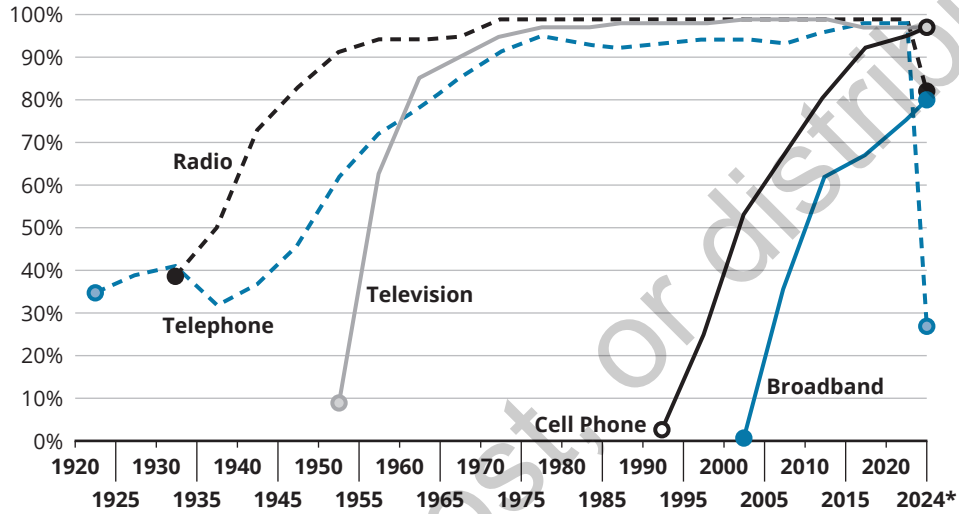
(*Continued*)

FIGURE 2.1 ■ Timeline of Select Media Developments (*Continued*)

Year	Media-Related Advancement
1950 cont.	1972 First video game console that connects to a TV is introduced
	1975 First microcomputer is marketed
	Fiber-optic transmission begins
	HBO is first to transmit programming to cable TV systems via satellite
	1982 Audio compact disk (CD) is introduced
	1990 World Wide Web (WWW) is released as simple user interface
	1994 Commercial short message service (SMS), or "texting," begins in Finland; BellSouth introduces first multipurpose "smartphone"
	1997 First consumer WiFi service released
	1998 Digital TV broadcasting begins
	1999 Netflix launches DVD-by-mail subscription service; adds streaming in 2007
2000	2001 Satellite-based digital radio services grow with the launch of XM radio
	2002 Friendster social networking site launched; Facebook (2004) follows
	2005 YouTube video site is founded
	2006 First e-book reader is introduced Twitter is founded
	2007 Hulu launched to stream commercial television programs and movies on demand
	2008 Roku, digital media player set top box, simplifies internet streaming television
2010	2010 Apple's iPad helps spark revival in the dormant tablet computer market Instagram appears, helping make photo sharing wildly popular
	2011 Snapchat introduced, offering increased privacy via self-destructing messaging
	2018 Smart speakers gain in popularity with Amazon's Echo (2015), Google's Home (2016), and Apple's HomePod (2018)
	2018 TikTok becomes the most downloaded app, reaching 1 billion total downloads
2020	2022 Major generative AI tools are released, including ChatGPT, Character.ai, and DALL-E

Given the inescapabilty of media and their significance in our lives, it's easy to forget that most forms of media technology didn't exist or were not widely available 100 years ago. Figure 2.2 shows adoption rates for select media technologies in the United States over the last century. Clearly, our media/society is a relatively recent development.

FIGURE 2.2 ■ U.S. Adoption Rates for Select Media Technology, 1920–2024



*2024 numbers are estimates. "Cell Phone" and "Broadband" refer to percentage of adults with access; other categories are household adoption rates.

Sources: Adapted from the National Center for Health Statistics (2017); Pew Research Center (2017a, 2017b, 2024a); U.S. Census Bureau (1999, 2012); U.S. Energy Information Administration (2017).

Figure 2.2 highlights another fact about media: New technologies usually don't displace older technologies. Radio didn't destroy print; television didn't kill radio; and the internet has not put an end to television. Instead, media technologies tend to accumulate, contributing to the pervasiveness of media in our lives.

How can we best understand this growing array of technology? How might it be affecting us? And why might this be important? Scholars have long debated such questions. There have been two general approaches to understanding the role of technology in society. The first, often referred to as "technological determinism," suggests that *technology* itself causes change, and often in unintended ways. The second, often referred to as "social constructionism" (or "social determinism" or "social constructivism") emphasizes that technology is made up of inanimate objects, and ultimately *people* decide how to use (or not use) technology. Even though debates about technology are often presented as a contrast between these two approaches, in reality, nearly all scholars fall somewhere in between the extremes of pure technological determinism and social constructionism. The real debates are about the degree to which technology or human action should be seen as the driving focus of change.

TECHNOLOGICAL DETERMINISM

Technological determinism is an approach that identifies technology, or technological developments, as the central causal element in processes of social change. Scholars who lean toward technological determinism emphasize the "overwhelming and inevitable" effects of technologies on users, organizations, and societies (Lievrouw and Livingstone 2006:21). This applies to all forms of technology, most of which have nothing to do with media. From this perspective, technology produces change, albeit often through a series of intermediary steps. For example, the invention of the automobile might be said to lead to a reduction in food prices because the automobile "reduced the demand for horses, which reduced the demand for feed grain, which increased the land available for planting edible grains," making food less expensive (Fischer 1992:8).

As we will see, critics argue that there is no human agency in this type of analysis. Pure technological determinism suggests that technological properties demand certain results and that people do not use technologies so much as people are used by them. In this view, society is transformed according to a technical, rather than a human, agenda. Critics contend this cannot be true. Technology is composed of inanimate objects; it is humans who cause things to happen by the choices they make and the actions they take.

However, this crude form of technological determinism is often an accusation leveled by critics more than a position advocated by scholars. In recent years, some scholars have adopted the language of "materiality" in arguing that the physical aspects of media technology matter in complicated ways (Gillespie, Boczkowski, and Foot 2014). In using this language, they hope to distinguish their approach from the simplistic caricature of technological determinism. Whether you call it a form of technological determinism or an emphasis on materiality, the physical aspects of technology are of interest to anyone who wants to understand the media.

Media's Materiality

It may seem odd to suggest that the inanimate objects making up technology can *cause* anything. But scholars who focus on the material influence of technology usually mean something more nuanced.

The obvious forms of materiality are the tangible objects and "things" that are involved in media communication—keyboards, screens, paper, and the like. But materiality also includes things that we often forget have a physical foundation (Allen-Robertson 2015; Pinch 2008). Data are not objects, but they exist on hard drives and servers. If there was no material component to data, there would be no limit to the amount of data you could store on a phone. A change in materiality—the storage capacity of phones—contributed to a change in how phones can be used. The internet is another example. Despite the popular metaphor, the internet is not an amorphous "cloud." Instead, data packets are transmitted along cables to be displayed on screens. As Blum (2012) reminds us, the internet is made of pulses of light

> produced by powerful lasers contained in steel boxes housed (predominantly) in unmarked buildings. The lasers exist. The boxes exist. The buildings exist. The Internet exists—it has a physical reality, an essential infrastructure. (pp. 9–10)

All of these material elements are necessary and shape how we experience the internet.

More directly, all media technology has its own technological capabilities and limitations that affect the delivery of words, sound, pictures, and video. For instance, while many assumed that younger people would mostly adopt e-book technology, it was quite popular among older people. This was because of how this new technology could be used. While older people who struggled with their eyesight had for decades been limited to those few books that were printed in large type, e-book technology allowed readers to read nearly any book in a font size that suited them.

In this example, different technologies do not "cause" books to contain different content. However, because of their capacities and limitations, these reading technologies enable different people to engage with them. E-book technology also allows people to easily bring more books while traveling, while at the same time, print books can be displayed in a home as a conversation starter in a way that e-books cannot. This is one way technology matters; it offers opportunities and places limitations on what a medium can be used for and makes some types of media more suitable for some purposes than others. In this way, each medium can be said to influence its users.

"Autonomous Technology" and "Technological Momentum"

Technology matters in other ways, too. Scholars in science and technology studies have long noted that technology can "take on a life of its own," even though people create and use it. For example, Langdon Winner (1977) used the term *autonomous technology* as "a general label for all conceptions and observations to the effect that technology is somehow out of control by human agency" (p. 15). Winner argued that political, economic, social, and cultural conditions shape the creation of technology and are embodied in technological artifacts and processes. However, Winner contended that technology is so vast and complex that it has unintended consequences that users and society as a whole often cannot control. He portrays technology as a potentially Frankenstein-like creation that can seem bewildering and unmanageable, especially in periods of rapid technological change. Today, the unknown implications of increasingly sophisticated artificial intelligence is an example of potentially autonomous technology. In the world of media, the growing dependence on algorithms that humans create but often don't fully understand might also be seen as an example of "autonomous technology."

Thomas Hughes's (1983) idea of *technological momentum* suggests that a technology's influence changes over time. When a technology is new, Hughes argues, humans have agency over the ways in which it is developed, deployed, and used. New technologies are still in flux and full of possibilities, as creators and users negotiate how the technology will be used. As time passes, though, a technology becomes established, routinized, and institutionalized, making it more difficult to contest or change. This can be because of investment costs, habit, or inertia, but once a technology is established, a culture develops around it, and it can gain a permanency that is difficult for people to change. For example, consider the electrical outlets that we plug devices into, which are different around the world. Different regions of the world made the decision to adopt different (locally standardized) prongs for electrical outlets when global travel was less frequent. We are now stuck with our system of different outlets, as no region of the world is going to change their outlets and appliances to make life for tourists more convenient.

Both concepts from Winner and Hughes are examples of ways to think about how technology can exert some autonomous influence over actors in society (a notion associated with technological determinism) while acknowledging the agency of humans in creating technology (an idea compatible with social constructionism). Understanding technology in such ways accepts the push-pull interaction between the material (nonhuman) and the social (human) as an essential dynamic of technological systems.

Medium Theory

Media scholars and commentators have long been concerned about technology's possible negative impact on society. As early as the 1920s, there was worry that newly introduced media technologies—film and broadcasting—might have some inherent power to influence susceptible audiences. During the two world wars, for example, governments on both sides used radio and newsreel propaganda effectively, enhancing concerns about the impact of these technologies. Later, television was blamed for making people stupid, earning it nicknames such as the "idiot box." More recently, the internet and smartphone technology have been criticized for possibly "ruining" an entire generation with their addictive properties. To varying degrees, these critiques presented technology as overtaking society and diminishing human agency.

But such concern never constituted the bulk of media scholarship. Historically, most media scholars have focused on media industries, the content they produce, and the users that consume it rather than on technology. Most media scholars have long argued that technology is essentially "neutral." Its effects depend on the media industries that implement it and on the "active" audiences who uses media technology and interprets media messages (Buckingham 1993; Williams 1974).

The notable exception to this is work known as "medium theory" (or "media ecology") to emphasize media environments (Meyrowitz 1985; Scolari 2012; Strate 2017). Medium theorists see media as more than conduits for the transmission of messages; they argue that the very nature of the medium can be the key to its social impact. From this perspective, media technologies can be powerful social forces, affecting how we perceive and understand the world.

McLuhan's Optimism

The best-known variant of medium theory was the so-called Toronto School, initiated by political economist Harold Innis (1894–1952) and popularized by literary scholar Marshall McLuhan (1911–1980). Innis was interested in the effect of macro-level technologies on entire societies, such as the difference between cultures with oral versus written traditions. McLuhan focused on the media's influence on how individuals perceived and thought about the world.

McLuhan (1964) argued that, if we are interested in understanding the influence of media, we should focus on the ways each new medium disrupts tradition and reshapes social life. The message, for McLuhan, was not the formal content of media but the ways the media themselves extend our senses and alter our social world. What changes people, he argued, is not media content but the experience of the medium itself. McLuhan is best known for his succinct assertion that "the medium is the message" (McLuhan and Fiore 1967). If he were alive today, it's not hard to imagine McLuhan writing, for example, about how smartphones have altered our social interactions, regardless of what content we access with them.

In an early work, *The Gutenberg Galaxy*, McLuhan (1962) focused on the shift from oral to print societies, exploring the social implications of the 15th-century invention of the modern printing press by Johannes Gutenberg. He argued that new media technologies rework the balance of our senses, isolating and highlighting certain senses at the expense of others. Print, from this perspective, intensified the visual—we use our eyes to read—and separated it from other senses, in particular, sound.

In another work, *Understanding Media: The Extensions of Man*, McLuhan (1964) turned to the shift from print to electronic media, especially television. In it, he argued that, by delivering both images and sound, electronic media could help reconnect the senses that had been fragmented by print's exclusive focus on the visual. Further, McLuhan argued, by allowing us to see images and hear sounds from distant places instantaneously, electronic media are a global extension of our senses. "[W]e have extended our central nervous system itself in a global embrace, abolishing both space and time" (p. 19), he wrote. This perspective led him to optimistic predictions of the development of a new "global village"—a term he popularized—based on the wonders of communication technology.

In McLuhan's technological determinism, each medium shaped our senses in such a way that certain social outcomes would be almost inevitable. Because the dominant media of an era are all-encompassing, McLuhan argued it is virtually impossible for people to see the ways technology influences them. Because McLuhan was generally an enthusiast for new technologies, this sort of stealth determinism did not alarm him. Instead, he saw electronic media as opening the door to new and more holistic ways of thinking.

Postman's Pessimism

Although McLuhan's vision of new technologies was an optimistic one, other analysts working in the tradition of technological determinism have cast a more skeptical eye on technology. For example, some critics—most notably Neil Postman (1931–2003)—argued that the rise of television was the central cause of the decline in the seriousness of public life. The underlying premise is that what we say is, in large part, the result of the form—or technology—we use to say it. According to this view, the substance of democracy—participation by an informed citizenry—was undermined by the rise of television. The properties of television encouraged, perhaps even dictated, particular ways of talking and thinking that were antithetical to serious debate and discussion. Think of the shouting matches on some cable news programs, or the "fluff" pieces that sometimes get included as "news." In the end, according to the title of Postman's best-known work, as a society infatuated with entertainment television that is no longer able to think seriously about social and political issues, we are *Amusing Ourselves to Death* (1985).

This kind of critique of the television age is often a nostalgic lament for the bygone days when print was the dominant form of media in American society. Following McLuhan, Postman (1985) argued that print-based societies changed how we think. But Postman saw literacy as encouraging rationality, seriousness, and coherence in both our ways of thinking and the content of public discourse. Reading, Postman believed, creates a mind in which analytic thought, based on logic and clarity, is premium. Societies that rely on the printed word as the central means of private and public communication, therefore, develop rational, serious populations, he argued. Postman identified 18th- and 19th-century America, which witnessed the

birth and rise of U.S. democracy, as the most thoroughly print-based culture in history. Others have made similar arguments about the connection between print and rationality, suggesting that, for example, the development of the printing press played a key role in the rise of scientific thinking (Eisenstein 1979). Therefore, unlike McLuhan, Postman was concerned with the ways that, as a technology, television ostensibly replaced print and by extension caused the rational and logical print culture of America to be replaced by a culture obsessed with entertainment, triviality, and unconsidered emotional response.

While most of his focus was on television, Postman thought that the seriousness of print culture was already in decline before television's arrival because of other technologies, especially the telegraph and photograph. The telegraph, according to Postman, challenged the world defined by print in three fundamental ways:

1. Because they could get information from faraway places, newspapers were full of stories that were largely irrelevant to their readers. News no longer had to have a relationship to its audience, nor did information have to be functional—it just had to be "new."
2. Because the telegraph made it easy to transmit so much information, little of which was relevant to the lives of readers, news no longer had any connection to action. People could not do anything about the things they read about in the paper. Information may have been abundant, but events were happening so far away and were so disconnected from people's lives that the news encouraged feelings of powerlessness.
3. In privileging speed and abundance of information, the telegraph sacrificed context. No longer did news have to be linked to a broader, historical framework. There was no need to connect one story to the next or one day's headlines to the next day's. The point was to keep the information flowing—to report the new things that happened—rather than to contextualize messages or events by linking them to prior messages or events. Quantity became more important than quality or depth.

The photograph extended what Postman (1985) saw as a revolution in the ways we understand the world. Photos do not encourage logical argument or contextual knowledge. Instead, as Postman put it, "The point of photography is to isolate images from context, so as to make them visible in a different way" (p. 73). As the saying goes, a picture is worth 1,000 words. But Postman argued that, when we trade words for pictures, we lose something in the deal. The very meaning of information, of truth, is altered by a focus on the visual image of the photograph. Truth is no longer knowledge produced from logical thought, the kind of thinking that reading encourages. Instead, "seeing is believing."

If seeing is believing, then those who can skillfully manipulate what we see can also influence what we believe. A generation before Postman, historian Daniel Boorstin (1961) argued that the pervasiveness of visual images was changing the very meaning of "reality." Images have become so embedded in our consciousness, in this view, that it is becoming harder to discern between image and reality. It is not that we are losing our ability to think; it is that

image-oriented pseudo-events blur the distinction between image and reality. *Pseudo-events* are events planned for the express purpose of producing dramatic images that can be disseminated or reported. In effect, they are events that take place only to be publicized. Pseudo-events can include press conferences, televised debates between political candidates, and photo opportunities—all staged to produce dramatic images. Pseudo-events, however, are neither true nor false. Think of the glamorous travel photos of an Instagram influencer, which are staged to present the more glamorous sides of life, leaving out the hours of unglamorous work required to capture the photos. For pseudo-events, appearance, not substance, is what matters.

Postmodernist theorists suggested that contemporary society is increasingly characterized by this kind of "hyperreality," in which the boundary that used to separate reality from its representation has "imploded," leaving images with no real-world referents (Baudrillard 1988). One does not have to be a postmodernist, however, to see the significance of image making. Writing in the age of television—but still relevant today—Postman saw that, in a world dominated by visual media, fast-paced entertainment may have become the model for all of society.

There can be little doubt that critics such as Postman and Boorstin were correct about the significance of images and visual media in American society. However, the causal claims—that inherent properties of media technology are the key determining force—are more difficult to accept. The problem with such technological determinism is that it ignores people, except perhaps as victims of an all-powerful medium. Even though it is rarely explicit, most critics of television write about *commercial television*, not simply television technology (Hoynes 1994). The claims that television, as a technology, must be about entertainment, attractive images, and rapid movement from one idea to the next are not some technological law of nature. They are the result of an industry—driven by people and market forces—in which the need to sell products and make profits has dominated (Croteau and Hoynes 2006). Similarly, the internet introduced a new level of engagement and entertainment, but these efforts were shaped by the commercial forces seeking our attention (Wu 2016).

As should be clear now, there are a range of ideas that can loosely be grouped under the umbrella of technological determinism. What they have in common is a focus on the role technology plays in influencing individuals and society more broadly. This emphasis contrasts with the focus social constructionism brings to the role of human agency and social forces.

SOCIAL CONSTRUCTIONISM

As the name suggests, social constructionism emphasizes the social construction of technology, focusing on the role of active human agents in determining how technology is developed and used. These analyses usually acknowledge that technology matters, but they theorize technology and social forces as interdependent and mutually influential. Social forces—such as cultural norms, economic pressures, and legal regulations—shape the ways in which technologies are designed and developed. In addition, ordinary users influence how these technologies are used and, often, whether the technologies succeed or fail.

Social constructionism is part of the broader sociological perspective that sees all of social reality as socially constructed (Berger and Luckmann 1966). Specifically, social reality is produced in three steps:

1. People create society through ongoing processes of physical and mental activity.
2. Over time, these creations come to seem objectively real, separate from human activity.
3. People internalize the norms and values of their culture, thereby being influenced by their own creation.

So we are influenced by the things we create in part because we forget that we created them; they seem "normal," "natural," and perhaps inevitable to us. However, because we collectively create social reality, we can always change it.

This basic argument for the social construction of reality underlies the constructionist approach to media technology. Humans create technology, and even though it sometimes appears technology has a life of its own, in fact, we have the power to alter how we use it—a fundamental difference from technological determinism. This insight has long animated a range of work that highlights the social construction of technology, both in and outside of media (Bijker, Hughes, and Pinch 2012; MacKenzie and Wajcman 1999). Among other things, researchers have highlighted the important role of "active audiences" in interpreting and making use of media.

For example, Raymond Williams (1974) opens a classic work by noting, "It is often said that television has altered our world" (p. 9). Williams then proceeds to dismantle this argument—which he says is technological determinism—by pointing out the interrelationship between technologies and the preexisting cultural values and practices in a society. Thus, he notes, television in the United States and the United Kingdom first emerged as two very different things because of what he considered to be the contrasting social values of the two societies. The more individualized values of U.S. society, Williams argued, led to taking this new technology and turning it into a privately owned commercial television industry with entertaining content that attracted audiences whose viewership could be sold to advertisers. Meanwhile, comparatively collectivist British social values were embodied in the British Broadcasting Corporation (BBC), owned and funded by citizens, which took the same technology and used it to focus on public service. In this way, technology did not inevitably lead to a single model for television; cultural values defined how technology would be used, which would then reinforce those values.

Social constructionists argue that users matter, too. For example, one variant of a constructionist approach, domestication theory, suggests that ordinary users "appropriate" technology of all sorts, bringing it into their homes and daily lives (Bakardjieva 2005, 2011; Silverstone and Hirsch 1992). In doing so they are consumers who both connect to the outside world of commerce while asserting their own identities through their consumption and use of technologies. Often, users end up changing technology by adapting it in novel ways, and these actions influence the developers of future technologies.

Having sketched out the ways technological determinists and social constructionists view technology, we move now to see how such dynamics played out during the emergence of various

media technologies. In our overview, we address the material reality of technology (from the technological determinism end of the continuum) but highlight examples of how human agency shaped technology (from social constructionism). As outlined in Chapter 1, our sociological approach embraces the tension between media technology and the people who create, regulate, and use it. It is part of the push-pull dynamic we highlight throughout this book.

FROM PRINT TO TELEVISION

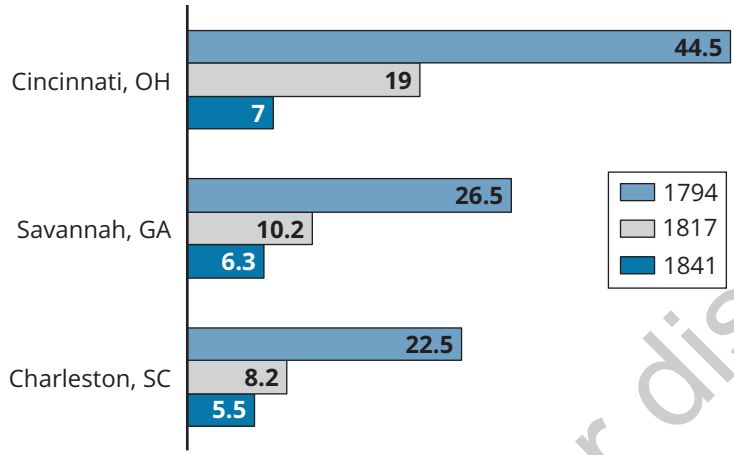
The Print Medium

The introduction of the printing press had a substantial impact on human history. Building on earlier technology, in the mid-1400s, Johannes Gutenberg demonstrated a practicable way to print by converting a winepress into the first modern printing press with movable metal type. Although the technology had evolved, media content changed little at first. Given the power of the Catholic Church in Europe at the time, the Bible was the book most often produced by early printers. Thus, as was true for later changes, social forces other than technology determined how a new medium was used.

But printing technology also contributed to—or at least facilitated— unanticipated social change (Eisenstein 1979). Prior to printing, books had to be copied by hand, making them expensive, rare, and available only to a small number of scholars, primarily clergy. Printing—and the corresponding growth in literacy—helped democratize learning by making books more affordable and widely available. The Protestant Reformation that began with Martin Luther in 1517 was fueled, in part, by the ability of literate believers to now read the Bible for themselves, sometimes calling into question the Catholic Church's interpretation and authority. Over time, printing accelerated the pace of innovation in philosophy, science, the arts, politics, and other fields by helping spread information and ideas throughout and across cultures. It was now more possible for people to read and learn on their own, perhaps contributing to the rise of individualism in Western society, too. More broadly, print fundamentally changed how human societies operated. Oral traditions in storytelling and history were eventually supplanted by written texts. Arguably, as medium theorists contend, thinking changed as a result. Written texts required a disciplined approach to communication that favored linear sequencing of thoughts and reasoned arguments, which became hallmarks of these philosophical and scientific traditions.

At the founding of the United States, print media—in the form of books, newspapers, and pamphlets—was still the only means for reaching a wide audience. However, distribution was limited and slow because of the need for physical delivery of print material. Information traveled only as fast and as far as a horse, train, or ship could carry it. It routinely took four to eight weeks for information to travel from Europe to the United States. Even communication between distances that we now perceive to be quite short—from New York to Washington, for example—were slowed by the need for messages to travel physically between the two locations. As late as the 1840s, it still took several days for news to travel from one city to the next (see Figure 2.3). One consequence of this limitation is that most publications tended to remain local, resulting in a highly fragmented and isolated media landscape.

FIGURE 2.3 ■ Time (in Days) Required for News to Travel From New York to Select Cities, 1794–1841



Source: Pred (1973).

The Telegraph

Although it is not a mass medium, the telegraph was an advance in communications technology that had major implications for other media. The invention of the telegraph in the 1840s allowed for near instantaneous communication over long distances, so long as they had been wired together. For the first time, there was a separation between physical transportation and long-distance communication. The telegraph did not reach a large audience, but it did speed up the spread of information through newspapers. Reporters could send news stories instantaneously over a long distance to newspapers that would then print and distribute the story locally. News not only spread faster and further this way, but wire services also began producing content that was used in multiple markets. These wire service stories helped unify—and critics would say homogenize—what had previously been a fragmented and localized news culture.

Print media had been highly decentralized, with local printers setting up shop in most communities. In contrast, the material nature of the telegraph—with single lines spread across thousands of miles—lent itself to more centralized control. In short order, companies competed until telegraph ownership became highly concentrated. By the 1870s, Western Union was the owner of the only nationwide telegraph network, and it carried Associated Press (AP) stories exclusively. Using this monopoly position, Western Union worked closely with the Republican Party to promote its agenda and candidates, arguably winning the election for President Rutherford B. Hayes in 1876. For example, Western Union provided Hayes with the telegrams of his rivals, allowing his campaign to be one step ahead of the opposition (Blondheim 1994; Wu 2011). This is an example of technology leading to an unintended social change. Hayes may have never been

president without the invention of the telegraph (technological determinism), but the telegraph didn't *cause* his victory. Instead, it was political allies who used the technology in this way (social constructionism).

The telegraph also foreshadowed several issues associated with emerging media technologies, including the increased speed of communication, the dangers of centralized control of technology, how control of technology can help shape which content is available, and how the integration of technology produced more unified—perhaps homogenized—content. All of these issues would reappear with later technologies.

The Telephone

The telephone is also not a mass medium, but it influenced other media in ways that are still felt today. In 1876, Alexander Graham Bell was issued a patent for the invention of the telephone, which opened the way for more widely accessible, personal, long-distance communication. But telephone technology went through considerable evolution as users experimented with different ways of employing it, companies competed in how to deploy it, and the government eventually moved to regulate it—all of which shaped the evolution of the modern telephone (Fischer 1992; Wu 2011).

When the telephone was invented, Western Union hoped to use it as a tool to make sending and receiving telegraphs more convenient. To send a long-distance telegraph message, customers would simply make a local phone call to the Western Union office. For a variety of reasons, including challenges to their patents, this never happened. Western Union agreed to drop out of the phone business as long as the newly created Bell Telephone Company agreed to stay out of the telegraph business. From that point on, Bell—later known as American Telephone and Telegraph (AT&T)—became the dominant phone company. For two decades, it held the patents that enabled it to operate as a monopoly, providing profitable service mainly to businesses and wealthy clientele in major cities. By 1893, about two-thirds of the nation's telephones were in businesses, while residential service was limited (Fischer 1992:42)

In the mid-1890s, though, Bell's key patents expired, introducing a brief era of competition during which telephones were transformed from a luxury business service to a widespread and common utility. In just a few years, thousands of "independents" sprang up, ranging from innovative businesses using the technology to very basic community operations operating as nonprofit cooperatives. About 3,000 of these were for-profit businesses, and by 1902, fully half of communities with a population of 4,000 or more had at least two competing, independent phone companies. In addition, another 6,000 shareholder–subscriber "mutuals" were created to provide low-cost community access (Fischer 1992:43–4).

In some rural areas, where commercial service was unavailable or too expensive, farmers set up lines along existing barbed wire fences, providing unsophisticated but low-cost phone service. These "farmer lines" had no privacy; they operated as a giant party line to which anyone in the community who was connected could listen. Users would sometimes organize telephone parties on a specific day and time, during which local musicians performed and storytellers entertained. Other time slots might be reserved for

sharing the weather forecast and regional news. Using the technology in ways that were never intended, farmers were essentially "broadcasting" years before radio broadcasting technology existed (Wu 2011).

Telephone competition was short-lived, however, ending in 1913. The independents fought among themselves for small markets, often failing or being taken over by Bell—now a division of AT&T. Bell aggressively drove out local competition, sometimes using the profits from its lucrative urban markets to engage in predatory pricing in smaller communities and rural areas. At the national level, AT&T took over Western Union, gaining unmatched access to the "long lines" that connected cities. By moving to take over both local and national communications, AT&T consolidated its control over the industry.

As AT&T's monopoly status became clearer, government antitrust regulators began investigating. In the end, AT&T asked to be regulated in exchange for continuing to hold its monopoly. In the Kingsbury Commitment of 1913, it agreed to operate based on rates set by the government, to sell off Western Union, to stop acquiring more independents, and to permit the remaining independents to connect to its long-distance services. For the guaranteed revenue stream that came with such a monopoly, AT&T promised to make access to high-quality standardized phone service available to everyone. The company became a public utility and later officially became a "common carrier," equally open to all users without discrimination.

Often known as "Ma Bell" or simply "the phone company," the AT&T monopoly was a universal presence in American life until its breakup in 1982. The company had four divisions:

- Bell companies provided local telephone service.
- AT&T Long Lines connected local communities for long-distance service.
- Western Electric manufactured communications hardware.
- Bell Labs conducted research and development.

Government regulations protected the monopoly by forbidding competition. Consequently, AT&T controlled everything from the home phone (which was typically rented from AT&T, not owned by the resident or business) to the local and long-distance wires and all of the switching equipment in between.

Because telephone lines reached almost everywhere by the mid-20th century, they served as important information conduits for other media. Radio and television broadcast networks used phone lines to relay their programming across the country, which were then aired by local broadcasters. Later, early dial-up modems and high-bandwidth Digital Subscriber Line (DSL) service used telephone wires to connect users to the internet, too.

With standardized equipment and centralized control, the quality of telephone service under the AT&T monopoly was generally quite good. Bell Labs also provided the government with valuable defense and security-related research. However, without competition, costs could be high, and innovation that did not serve the existing business model was often suppressed. For example, Bell Labs' scientists discovered magnetic tape recording and created

a prototype answering machine in the 1930s. However, the inventions were shelved because company officials feared the public would avoid using the telephone if they knew their conversations could be recorded. Magnetic tape recording in the form of the audiocassette became available only in 1962—first from foreign companies. Bell also discovered and put on hold early versions of fiber optics, mobile phones, fax machines, and speaker phones, among others (Wu 2011).

Over time, the political climate changed, and little by little, the AT&T monopoly was weakened. For example, building on a 1968 ruling, the Federal Communications Commission (FCC) mandated that the standard phone jack be used on all equipment. This allowed people to plug non-AT&T technology into their phone lines, sparking innovative third-party products, such as fax machines, cheaper telephones, and internet modems. In 1971, the FCC barred AT&T from entering data processing or online services, which enabled the growth of America Online (AOL) and other early internet service providers (ISPs) (Wu 2011).

Most significantly, in 1982, a long-term antitrust suit was settled, and AT&T agreed to be broken up into eight separate "Baby Bell" entities that were required to accept connections from smaller competitors (see Figure 2.4). This breakup unleashed enormous competition and innovation. Most notably, expensive long-distance services—which had long subsidized local service in sparsely populated areas—were now open to competition, bringing costs down sharply. As media and legal scholar Tim Wu (2011) notes,

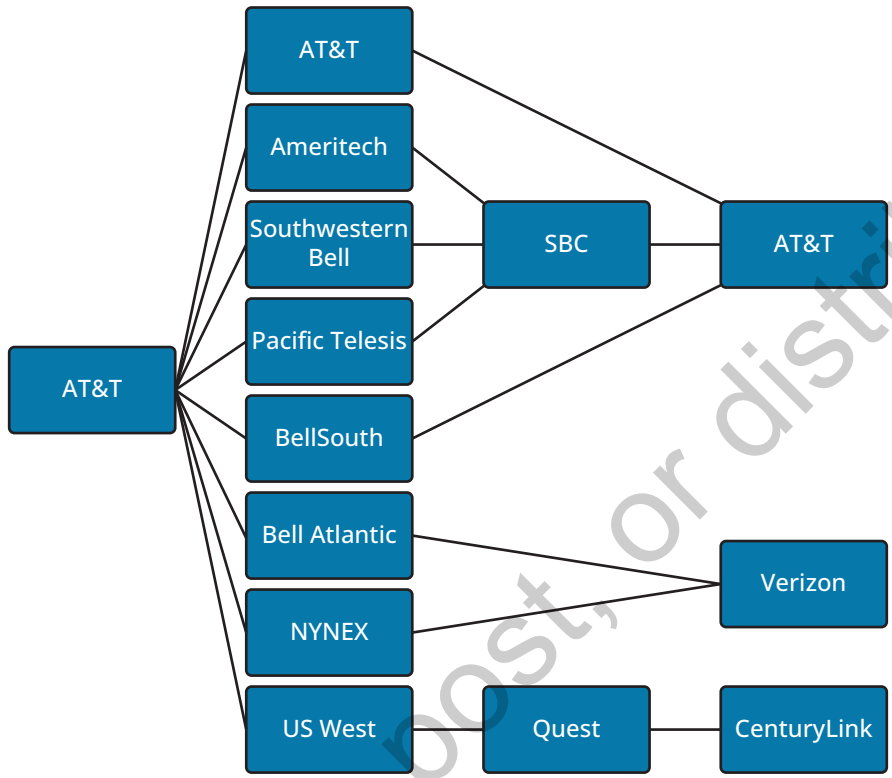
> [T]he breakup of Bell laid the foundation for every important communications revolution since the 1980s onward. There was no way of knowing that thirty years on we would have an Internet, handheld computers, and social networking, but it is hard to imagine their coming when they did had the company that buried the answering machine remained intact. (p. 162)

But, again, this era of competition was short-lived. The pre–1982 AT&T has slowly reconsolidated over the past 40 years; the eight "Baby Bell" companies have become the "Big Three" telecom companies of today: AT&T, Verizon, and Lumen Technologies.

Telephone technology clearly changed the way we live. But the telephone's history illustrates how human agency ultimately determines the shape and direction of technological development and use. The regulatory environment, for example, influenced the way telephone technology was created and deployed. Users, too, helped shape the way the technology was incorporated into daily life. In fact, in his classic social history of the telephone, sociologist Claude Fischer (1992) argues that we should not even ask what "impact" a technology has had on a particular society because this question implies from the outset that the technologies do something to us. Fischer (1992) contends,

> [W]hile a material change as fundamental as the telephone alters the conditions of daily life, it does not determine the basic character of that life. Instead, people turn new devices to various purposes, even ones that the producers could hardly have foreseen or desired. As much as people adapt their lives to the changed circumstances created by a new technology, they also adapt that technology to their lives. (p. 5)

FIGURE 2.4 ■ The Breakup and Reconsolidation of the Telephone Industry



Source: Wu (2011).

Sound Recording

In 1878, Thomas Edison received a patent for the cylinder-based phonograph, which would lead to the first new mass medium since print. Edison referred to his invention as a "talking machine" and believed that "[t]he main utility of the phonograph [is] for the purpose of letter writing and other forms of dictation" to be used in conducting business correspondence (Katz 2012:13). However, other developers and users had different ideas about how to use this technology.

Within a decade, phonograph records featuring musical recordings were introduced, and as other forms of sound recording proliferated, music became the primary application of sound recording. At first, the standard phonograph record was the 78 rpm that could accommodate a three-minute recording on each side. In 1948, the long-playing (LP) 33⅓ rpm record was launched and became the industry standard for more than 30 years. Magnetic tape became most popular in cassette form, introduced in the 1960s, which enabled people to easily make

their own recordings or assemble mix tapes. This technology made music more mobile, too, because tapes could be played in car stereos and on portable tape players. In the early 1980s, sound recording became digital, and the compact disk (CD) emerged as the dominant recording format. By the 1990s, compressed digital file formats, such as MP3, allowed music to be distributed via the internet and stored on MP3 players and smartphones. Since 2011, digital music has made up the majority of music sales, outselling CDs and vinyl LPs. Sales of specific music recordings have been displaced by subscriptions to streaming audio services, such as Spotify, which have accounted for the majority of digital music revenue since 2016 (International Federation of the Phonographic Industry 2017a).

Through its various incarnations, the technology behind sound recording enabled significant social change. Prior to recordings, music was experienced exclusively in live performances, often in group settings. Recordings meant that such music was available to hear—and replay at will—in the privacy of the home and was often experienced alone. Solitary listening was so new and startling that users had to be educated about the experience.

Because access to professionally created music was so limited before recordings were available, the "music industry" largely focused on selling instruments and sheet music for amateurs to play for family and friends at home. With recorded music available, social gatherings didn't stop, but playing recorded music became commonplace—and sometimes controversial. Composer and conductor John Phillip Sousa gained fame from his early recordings of marching music (Eschner 2017). But he penned an essay in 1906 warning about recordings (and player pianos) as the "menace of mechanical music." Part of his concern involved the rights of copyright holders, but his apprehensions also included the worry that professionally recorded music would "substitute for human skill, intelligence and soul" that came from live performances.

Recording technology helped change the music artists made, too. For example, one side of the early 10-inch 78 rpm record could only accommodate a three-minute recording, so musicians changed how they wrote. By the 1950s, the 78 rpm record was replaced by LPs, which could accommodate recordings of more than 20 minutes on each side. However, the three-minute standard for a recording lived on because they could be sold as low-cost 45 rpm "singles." As a result, nearly every pop song of the 1950s and beyond was roughly three minutes in length. After getting longer with album-oriented radio, pop songs have again gotten shorter with the switch to online streaming. With this technology, musicians are paid per song streamed, not per minute of music streamed, making an hour of listening more profitable if it is made up of a larger number of short songs rather than a few longer songs.

New recording technology also changed the experience of musicians. Prior to recordings, live performances were the essence of being a professional musician. As the recording industry grew, studio recordings became the primary source of income for popular musicians. By the mid-20th century, the most popular artists launched concert tours primarily as promotional vehicles for selling records. But elaborate studio recordings that used complicated production techniques, such as overdubbing many tracks of the same artist, enabled the creation of recordings that could never be played live. The Beatles, for example, stopped touring in part because the complex studio recordings they were making later in their career could not be performed on stage.

Prior to the invention of sound recordings, listeners could experience music only in live settings, which is one reason so many communities had bandstands in local parks. With the phonograph, listening to music could be more private and individualized.

Credit: Vintage Images/Alamy Stock Photo

By the end of the century, new technology helped swing the pendulum back toward live performance. On the one hand, the sales of recorded music were undermined by musical "piracy" (via easily downloadable digital recordings) and streaming services (which generate lower revenue). Musicians, then, returned to relying on live performances to generate the bulk of their income. On the other hand, these live performances were sometimes enhanced by new technologies. Synthesizers and sampling made the inclusion of complicated and prerecorded sounds in live performances easy. More controversially, lip-synching to recorded music at "live" concerts became prevalent as well. Well-known pop artists such as Beyoncé, Mariah Carey, Madonna, and Britney Spears all lip-synched on stage. The reasons for doing so varied: Vocals created in the studio through digital manipulation, most famously with Auto-Tune, could not be performed live; grueling touring schedules and outdoor performances in variable weather conditions stressed artists' vocal chords; and shows often included dance performances that made simultaneous singing difficult (Lubet 2017). Frequently, the result has been a mixture of live performance with prerecorded enhancements.

Sound recordings have affected how we live our daily lives and impacted how musicians work. However, the application and evolution of recording technology did not proceed in the way its inventor had envisioned. Users made choices that altered the trajectory of sound recordings away from simple dictation for business purposes to broader applications. The music industry helped shape how we experience popular music. On the whole, recorded music also did not destroy amateur musicianship, as some had feared. To the contrary, millions of people were able to use sound recordings to help themselves learn how to play instruments. Some experimented with new recording technologies, creating new forms of music. Many other amateurs now record and edit their music on digital audio workstation (DAW) software that used to be accessible only to professionals. These amateurs can also distribute their music on platforms such as SoundCloud and YouTube, which offer greater potential audience reach—if not financial compensation—than could be dreamed of by prior generations of musicians.

Film and Video

Sound recordings enabled the permanent capture of what had previously been a fleeting auditory experience. Photography did the same for visual experiences. Soon, inventors created "moving pictures" through devices that gave individual users the illusion of motion by peering into a box to see a series of photographs flicker past. Modern "movies" were born in 1895, when Auguste and Louis Lumière first demonstrated their cinematograph, which used film to project moving pictures onto a screen viewed by an audience. Film technology eventually evolved to include the use of synchronized sound, color film stock, and digital technologies that have largely replaced film.

In their first decade, "movies" were brief, and more than 80 percent of them were about topical subjects such as news, travel, documentaries of everyday life, and sports (Starr 2004). In time, filmmakers shifted from using film technology to produce simple animated photographs to creating increasingly elaborate fictional stories. The nature of this evolution varied greatly, though, based on the social context within which it occurred.

For example, in the 1910s, a New York City–based "Film Trust," a cartel of 10 companies, controlled the U.S. film industry. The Trust had every important patent on motion picture technology and therefore kept out competition while dictating how the industry operated. The Trust set a price per foot of film that distributors would pay producers, a weekly price that exhibitors paid for the use of patented technology in projectors, and so on. Movies were, in effect, a commodity sold by the foot. The arrangement kept prices low to ensure a steady audience and guarantee a healthy profit. This monopoly, though, greatly restricted creativity. It blocked most film imports and limited U.S. moviemaking to short (less than 20 minutes), uncontroversial, uncomplicated films, featuring unknown and low-paid actors (Wu 2011).

Meanwhile in Europe, most notably France, there was no film cartel, and feature-length films starring well-known actors quickly became the norm. The model eventually made its way to the United States after a couple of renegade "independent" distributors—who refused to join the New York–based Film Trust—began importing foreign film stock and producing their own films. Sued hundreds of times by the Film Trust, the independent film producers fled New York and filmed in other locations, including Cuba. But Los Angeles proved the most convenient location for their work because they could quickly cross the Mexican border to avoid court injunctions and subpoenas. Thus, renegade filmmakers founded what eventually became the Hollywood movie industry (Wu 2011).

Film production exploded with the rise of independents. In 1914, more than 4,200 new films were reviewed in the industry press. U.S. filmmaking prospered and catered to a wide and diverse set of market niches across racial, ethnic, and political lines. World War I decimated the European film industry, opening the way for the domination of the U.S. industry there, too (Wu 2011). Movies became a central element of American leisure. By 1930, an astonishing 65 percent of Americans were attending movies at least once a week.

By the late 1970s, technological innovations radically changed how users interacted with films. Videocassette recorders (VCRs) allowed people to purchase or rent movies to watch in their homes, thereby privatizing the movie experience. Cheaper video cameras also enabled users to film and show their own videos more easily. In 1997, the digital video disk (DVD) was

introduced, marking the shift of movies to digital formats. Digital cameras, smartphones, and related software made it easier still for the general public to record, edit, produce, and store their own videos, whereas websites such as YouTube and Vimeo offered platforms for the upload, storage, and exhibition of amateur videos. With such sites and social media sharing, personal videos could now enter the public sphere. Meanwhile, a deep catalogue of commercial films was increasingly available through internet-based video-on-demand and streaming services, such as those provided by Netflix, Hulu, and Amazon.

Film technology changed how audiences—and later amateur filmmakers—related to movies and videos. But the development and application of this technology was shaped by the social forces surrounding it. Industry collusion in the form of the U.S. Film Trust limited how the technology could be used, whereas European filmmaking evolved differently. The action of renegade independents changed the U.S. film industry. Much later, users changed the nature of videos by taking advantage of new technology to record and share videos online. From recording embarrassing but amusing "fail" videos to documenting police shootings, smartphone videos and social media have added new complexity to the world of film/video creation and consumption.

Radio Broadcasting

Radio was developed over the first two decades of the 20th century. In contrast to a telegraph or telephone message sent via a wire to a particular person or destination, radio used the electromagnetic spectrum to transmit audio signals that could be received by anyone with a radio kit who was within range of the signal. Early amateur radio operators referred to this process as *broadcasting*, taking the term from a farming technique in which seeds were "cast broadly"—that is, scattered widely—rather than planted in neat rows. For the first time, media producers no longer had to physically distribute their products (e.g., to newsstands, record stores, or movie theaters), nor did the public have to travel to these locations to have access to mass media, further enabling privatized and individualized media experiences. In addition, broadcasting introduced the possibility of live programming as well as "free" content.

Although early radio was essentially the same technology we know today, people knew radio by a different name and understood it as a very different form of communication than we do now. That's because the social forces that later shaped the direction of radio technology had not yet coalesced. Corporate consolidation of the radio industry had not yet occurred, the government had not yet regulated the use of the electromagnetic spectrum, and investors had not yet recognized the profitability of producing household radio receiving devices. What we now take for granted—a model of broadcasting music, news, and entertainment programming usually supported by advertising—took two decades to evolve (Douglas 1987; McChesney 1994; Schiffer 1991; Wu 2011).

For the first 10 years after its invention, people called radio *the wireless* because its creator, Guglielmo Marconi, promoted it as a telegraph without wires. For Marconi, the wireless was an improvement of an existing point-to-point, two-way communication technology; it had nothing to do with broadcasting. Marconi hoped his wireless could serve as a substitute, or an upgrade, for long-distance communication by large commercial interests that relied on the telegraph, particularly newspapers and steamships. Individuals were not seen as users, and receive-only devices—what we call radios today—were still far off.

Despite its inventor's intentions, amateur radio operators quickly began experimenting with the technology. A radio subculture soon emerged in which sending and receiving long-distance communications became a popular hobby. As listeners tuned in at night, seeking transmissions from sites hundreds of miles away, it was amateurs who planted the seeds of the broadcast model and made the act of listening a leisure activity.

Because the airwaves have limited space and demand for their use was growing, amateurs came into conflict with commercial interests and the government. Each of them wanted to use radio technology in a different way, and a struggle over the control, definition, and proper use of radio ensued. Corporate interests sought private control of the airwaves to use them for profit. The U.S. Navy sought government control of the airwaves to use them for military and security purposes, particularly during wartime. Amateur radio enthusiasts saw the airwaves as a form of public property to be used by citizens to communicate with one another.

Both the U.S. Navy and the Marconi Company supported government regulation of the airwaves to organize and set limits on electromagnetic spectrum use. Douglas (1987) explains they agreed that "the amateurs had to be purged from the most desirable portion of the broadcast spectrum. They had to be transformed from an active to a passive audience, allowed to listen but not to 'talk'" (p. 233). The result was the Radio Act of 1912, which regulated the use of the airwaves by requiring all transmitting stations to be licensed by the federal government, thereby curtailing access for amateurs. So even before the notion of broadcasting had taken hold, the institutional structure of broadcasting was in place: centralized, licensed senders and large numbers of individual listeners.

Despite these restrictions, amateurs continued to operate radios in even larger numbers. Some made use of the shortwave frequencies that the government allocated for them, a few were granted government licenses to use the airwaves, and many more continued to operate without licenses. In 1917, when the United States declared war on Germany in World War I, the government ordered all amateur radio operators to shut down and dismantle their equipment. The police closed down more than 800 operators in New York alone (Douglas 1987). At the same time, the Navy was in need of experienced radio operators, so it recruited amateurs, who returned home after the war even more skilled in radio technology. By 1920, amateurs were experimenting with playing music and providing information over the air to other amateurs, who were encouraging their families and friends to listen along. Several amateur transmitters built up substantial audiences, while the corporate radio industry continued to focus on point-to-point communication.

All of this changed when, in the hope of increasing sales of their radio equipment, a Pittsburgh department store ran a local newspaper advertisement for a musical program broadcast by amateur Frank Conrad. Shortly thereafter, Westinghouse, one of the major manufacturers of radio sets, began financing Conrad's station as a means of selling its radios. Radio manufacturers AT&T and General Electric, along with department stores, quickly jumped into the business of broadcasting by setting up stations to stimulate the sale of radio sets. They had realized that the market for the broadcast model of radio was much larger than for the point-to-point model, offering the possibility of greater profits.

Soon, owning a radio set and being able to listen to the programs became highly popular. In 1922, AT&T began selling access to the airwaves as Marconi had done for private communication. The commercial broadcast model, with programming financed by the sale of

advertising, was established. Records are incomplete, but there were already more than 500 radio stations in 1923, and by the following year more than 2 million radio sets had been sold (Wu 2011:35).

The emergence of radio advertising was an important part of the clampdown on amateurs. Wu (2011:76–7) notes, "When revenues came from sale of radio sets, it was desirable to have as many people broadcasting as possible—nonprofits, churches, and other noncommercial entities. The more broadcasters, the more inducement for the consumer to buy a radio, and the more income for the industry." This revenue stream was limited, however; households needed only so many radios. In contrast, advertising was limitless, and "once advertisements were introduced, radio became a zero-sum game for the attention of listeners. Each station wanted the largest possible audience listening to *its* programming and *its* advertisements." In that scenario, amateur competition was a threat to profits and needed to be eliminated.

These developments were highly controversial and certainly were not inevitable. At first, even radio manufacturers worried about the emergence of radio advertising. The head of publicity for Westinghouse argued, "Direct advertising in radio broadcasting service [should] be absolutely prohibited" because "advertising would ruin the radio business, for nobody would stand for it." Then Secretary of Commerce—and later U.S. president—Herbert Hoover said of radio in 1922, "It is inconceivable that we should allow so great a possibility for service, for news, for entertainment, for education, and for vital commercial purposes to be drowned in advertising chatter" (Wu 2011:74). But in a few years, that's what occurred, and by 1931, Henry Lafount, the commissioner of the Federal Radio Commission (FRC, the precursor to the Federal Communications Commission [FCC]) would write, "Commercialism is the heart of the broadcasting industry in the United States" (Wu 2011:82).

Radio continued to evolve. For example, because of its limited range, early radio had been an inherently local medium. That changed when AT&T used its exclusive access to long-distance phone lines to establish the first nationwide radio broadcast network. With this model, centralized programming was sent over the lines to be simultaneously broadcast in local markets. With a much larger audience and more advertising revenue, the company could afford to produce high-quality programs with nationally known talent against which local broadcasters could not compete. But AT&T's short-lived dominance was challenged on patent grounds by the Radio Corporation of America (RCA), which had been formed out of the American Marconi Company. Eventually, through a series of court and binding arbitration agreements, AT&T agreed to leave the radio business if RCA agreed not to challenge AT&T's long-distance operations. RCA gave its resulting network a new name: the National Broadcasting Corporation (NBC) (Wu 2011:78).

The emerging group of major broadcasters encouraged the FRC to get rid of competing local stations to create "clear channels" for their large stations and networks, arguing that their better equipment and higher-quality programming better served the public. The FRC agreed, and the age of plentiful, small-scale local radio largely came to an end. Later, innovation was throttled for years when the FCC, at the behest of the radio giants who feared more competition, delayed the introduction of FM radio broadcasting, which enabled signals to be sent further, more clearly, and with less power. In these cases, too, a technology's application, and innovations in that technology, were shaped by the power of corporate and government players.

It took a number of years for radio to evolve into what we know it as today. Radio was first conceived of as a telegraph without wires that could improve one-to-one communication. Amateur radio enthusiasts adopted the technology to send and receive long-distance messages as a hobby. Only later did radio become primarily a way to broadcast music, news, and talk.

Credit: Underwood & Underwood, N.Y. Library of Congress Prints and Photographs Division, LC-USZ62-134577.

The route to radio broadcasting of music, news, and serials, all surrounded by ads, was not the straightforward result of some technological imperative. In fact, one of radio's great technological capacities—its ability to both send and receive messages—was largely abandoned in the final model, relegated to shortwave frequencies. By including factors beyond technology in our understanding of radio, we can see that what we often take for granted as radio's natural order of things is in fact the result of a complicated social process involving commercial interests, amateur users, and government regulators. Moreover, we can see that things could have turned out differently. Basic wireless technology might have been applied or further developed in a different direction, leading to different social consequences.

We don't need to rely on pure speculation to imagine these alternatives. In other countries, radio played a different role than in the United States. In some countries, radio served as a more distinct form of public service communication, aimed at raising the standard of political discourse. Sometimes such top-down communication was abused, as when Nazi propaganda minister Joseph Goebbels called radio "the spiritual weapon of the totalitarian state" and argued, "Above all, it is necessary to clearly centralize all radio activities" (Wu 2011:303, 385). In other countries, listeners have much more widespread access to the airwaves, which are not used to sell products with the same zeal as in the United States. Instead, in several countries, including England, Australia, Argentina, and Uruguay, a portion of the airwaves has been earmarked for "community radio" (Gordon 2008; Hintz 2011; Rennie 2006).

The evolution of radio, and the variations in how it has been adopted, again illustrates the fact that we cannot understand a new medium simply by looking at its technological component because this ignores the social processes that ultimately shaped its use.

Television

As an over-the-air (OTA) broadcast medium, television combines the ability of film to record and display moving images and sound with the ability of radio to broadcast live. The deployment of early television technology might have threatened the dominance of radio. However, after successfully eliminating amateur radio competition, the major radio companies effectively delayed and destroyed potential television competitors, too. NBC's owner, RCA, argued to the FCC in the 1930s that "[o]nly an experienced and responsible organization such as the Radio Corporation of America, should be granted licenses to broadcast material, for only such organizations can be depended upon to uphold high ideals of service" (Wu 2011:144). The FCC agreed and sharply limited the television stations that could broadcast until the 1940s, effectively locking out any amateur or fledgling competition. This gave RCA time to catch up in developing—and in some cases stealing—new technology. It also scared away potential investors from competing technology ventures, driving inventors and innovators into bankruptcy.

As a result, the few companies that dominated radio became the same players that dominated network television: NBC and ABC evolved from RCA's radio business, and CBS television was spun off from CBS radio. As a result, there was almost no innovation in programming; early television was essentially radio with pictures. The three major networks simply began shifting their radio programs—and advertisers—to the new television medium.

Building on radio's success, manufacturers and broadcasters marketed television as another form of privatized entertainment that would bring the family together to enjoy public amusement at home. They succeeded wildly. In the span of less than 10 years, between 1946 and 1955, television sets made their way into 65 percent of American households and were in 90 percent of households by 1960 (Spigel 1992). In relatively short order, television became a major part of American life. After a half century of analog broadcasting, manufacturers and broadcasters successfully lobbied the U.S. government to order all television stations to convert to digital signals in 2009. This marked yet another medium making the shift to the universal digital format. Digital programming could easily be transmitted over the air, via cable, via fiber optics, or through internet streaming to a wide range of devices, not just television sets.

Television and Daily Life

In its remarkable rise to prominence, the television industry both accommodated already existing family practices and tried to mold these practices (Spigel 1992). In this era, white middle-class women were perceived as having a great deal of "free time" during the day for leisure while also attending to housework. Therefore, producers directed most early television programming at women. Although broadcasters had largely repackaged radio programs for television at first, they soon learned that the technologies facilitated different sorts of audiences. Radio could provide entertainment while women worked because, as a purely aural medium, listening did not interfere with other activities. However, as a visual medium, it was more difficult to market television as something women could enjoy at the same time as they were doing housework. Leaders of the television industry were concerned that the new medium might not fit into women's lives and therefore might be underused or ignored altogether.

Both early television and computer manufacturers tried to sell new technologies as ways to enhance existing social relations. In time, both would enable significant change in the routines of daily life.

Credits: Ad*Access On-Line Project–Ad #TV0699, John W. Hartman Center for Sales, Advertising & Marketing History, Duke University, David M. Rubenstein Rare Book & Manuscript Library, http://library.duke.edu/digitalcollections/adaccess/; Atari Mania

One 1952 effort to overcome this hurdle came from manufacturers who developed a TV-Stove, an appliance that allowed women to watch television while they cooked. By designing an apparatus that accommodated existing cultural practices and traditions, the television industry hoped to attract viewers. The TV-Stove demonstrates that cultural practices can shape the development of media technology. It also shows how user preferences can be more powerful than technological innovation: The TV-Stove was a market failure.

Television broadcasters were more successful by designing the content of programming to accommodate the practices of 1950s middle-class women. Producers designed the "soap opera" (named after the soap manufacturers who often sponsored them) and the variety show as programming that would not interfere with women doing housework. Soap operas contained little action but a great deal of verbal explanation and often repeated the same themes. Viewers could listen from an adjacent room or could miss episodes without losing track of plot developments. Variety shows moved from one act to the next, making it easy for viewers to enjoy them, even if they watched only parts of the program. This, too, was ideal for women working around the house.

The television industry also tried to reshape family routines to be compatible with television viewing. For example, promoters billed NBC's *Today Show* as the TV equivalent of the morning newspaper. In addition, the networks routinized their schedules, previewed upcoming programs, and linked program times to the household activities of women and children, all of which encouraged viewers to adapt their daily routine to the television schedule. In the end, broadcast television became the centerpiece of U.S. consumer culture, influencing and

disrupting American traditions, practices, and buying habits. Still, television was not a predetermined entity; cultural practices shaped its early development and uses, just as the medium in turn influenced these practices.

Cable Television

Just like radio, broadcast—or OTA—television relies on the airwaves to send its signal. Due to limitations in bandwidth, the number of broadcast stations in any market is limited, and the audience must be within range of the broadcast signal. Beginning in the late 1940s, amateur operators in remote areas where broadcast signals didn't reach properly began to put up huge antennas to catch the weak signal and resend TV content via wires to local paying customers. Known then as Community Antenna Television (CATV), this was the birth of cable television (Wu 2011).

The early cable markets were tiny, and because the practice merely expanded the audience for existing programs, broadcasters were not particularly concerned. Over time, though, cable operations expanded. Cable companies moved into larger communities and eventually began to use microwave towers (the first practical alternative to phone lines for long-distance communication signals) to import programs from far away that would otherwise not be available locally. Since the local audience now might watch programs that originated elsewhere in the country, this threatened to undermine the broadcast business model. Broadcasters sued, claiming copyright infringement, but in 1968 the Supreme Court ruled in favor of cable operators. Broadcasters then turned to the FCC, which began using new regulations to bar cable from the largest markets and to otherwise strangle the industry. With cable expansion stopped, investment stopped.

By the end of the 1960s, though, the Nixon administration championed deregulating cable to open up the industry while avoiding monopoly concerns by keeping the owners of the wires separate from the producers of programming. Cable enthusiasts argued that it could help solve the problem of limited bandwidth. New channels could be devoted to public service and be a noncommercial alternative to advertiser-driven broadcasting. In this vision, cable operators would be in control of a few of the channels, while the bulk of cable channels would be available for public interest programming or be made available for lease. Cable did expand, but it did so as a fully commercialized system with just a few local "public access" channels (Wu 2011).

Continuing the long-standing trend of privatizing public entertainment, in 1972 HBO launched its "Home Box Office" service, bringing commercial-free feature films and sporting events to television. It was among the first channels to rely primarily on subscribers paying a premium fee rather than on advertisers. In 1975, HBO innovated technologically when it began to use satellites to deliver its content rather than AT&T's long-distance lines or microwave towers. This caught the attention of Ted Turner, who, in 1976, created a "superstation" when he bounced the data from his Atlanta broadcast station off of satellites down to local cable operators across the country. Using a similar technological approach in 1980, he launched the Cable News Network (CNN). Over the next decade, many others followed suit as new cable networks such as ESPN, MTV, Bravo, Showtime, BET, Discovery Channel, and Weather Channel—along with many that have since failed—were created. Television, long known for its limited and homogenous programming from three major broadcast networks, was transformed by the

spectacular growth of cable. Broadcast television networks (now often actually delivered via cable) would continue to be in the business of delivering large mainstream audiences to advertisers, but cable-only TV channels now could survive by "narrow-casting," delivering niche audiences to specialized advertisers, and by enticing these audiences to pay a premium for content they valued (Wu 2011).

Cable technology overcame the limited number of stations that could be accommodated in OTA broadcasting. As a result, television's business model—as well as its social impact—changed. As we've seen, early mass media—newspapers and local radio—were fragmented by locality because technological limits meant most content was created and distributed locally. Later, radio and television networks created a more unified, mainstream, national culture. For example, when Elvis Presley performed on *The Ed Sullivan Show*, his appearance drew an astounding 83 percent of American TV households. (In comparison, in recent years, even the highly rated Super Bowl has reached less than half of U.S. households.) American viewers shared a more common television culture in that time, but that programming was typically bland, designed so as not to offend viewers or potential advertisers, and wildly unrepresentative of the nation as a whole. People of color and others outside of the mainstream, white middle class were largely invisible on television. Wu (2011:214) calls the programming from this period "unprecedented cultural homogeneity" from networks that "were probably the most powerful and centralized information system in human history."

Cable changed that through an economic model that enabled the viewer to access a larger volume and variety of programming. However, content aimed at smaller and sometimes more adventurous audiences reintroduced cultural fragmentation. This time, though, fragmentation was based on interest, taste, and—with news and commentary—political orientation rather than locality. But cable was still homogenous in a key way: With few exceptions, its business model is unapologetically commercial, whether catering to advertisers or appealing to subscribers. Early cable enthusiasts, who saw cable as a public service alternative to the commercial broadcast networks, never saw their vision realized. Instead, cable grew into powerful local monopolies that, critics argued, offered high-priced packages bloated with many rarely viewed channels. Cable operators argued that this package model subsidized smaller niche stations that otherwise could not survive on their own.

In recent years, cord-cutters began voting with their feet as they abandoned cable in droves, relying more on streaming services for television and video entertainment. Netflix, especially, was a pioneer in offering users low-cost access to content from a wide variety of producers. Once the lucrative nature of streaming was evident, though, those producers sought to control both their own content and their own streaming platform. Increasingly, Netflix has focused on its own "original" programming, while producers like HBO, Disney, and NBC Universal all launched competing streaming platforms that spotlight their own content. For users, the result has been a fragmented and increasingly expensive landscape of streaming services.

Whether delivered via broadcast, cable, or streaming technology, commercial television became the centerpiece of U.S. consumer culture, influencing and disrupting American traditions, practices, and buying habits. Still, as we have seen, television was not a predetermined entity; cultural practices shaped its early development and uses, just as the medium in turn influenced these practices.

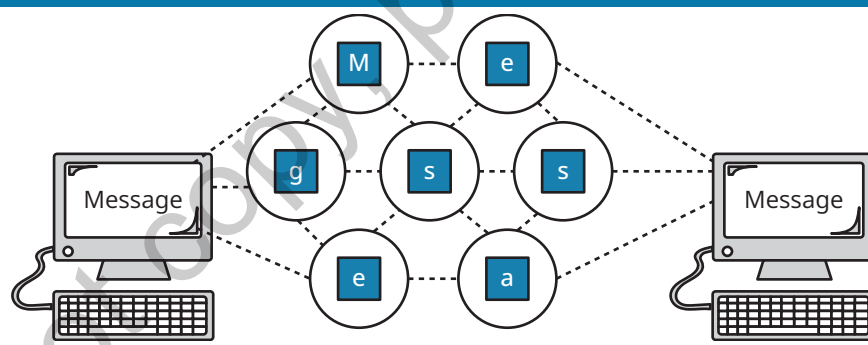
THE INTERNET

In many ways, today's media landscape is dominated by the internet. As with earlier technologies, the internet has enabled social change and, in turn, has been influenced by a variety of social forces. Because we explore many internet-related dynamics throughout the book, we limit our discussion here to an overview of narrow technology issues that distinguish the internet from other forms of media.

Creating the Internet

The internet is a vast network of interconnected computer networks whose underlying technology was developed over a half century (Abbate 1999; Hafner and Lyon 1996; Naughton 2000). In 1958, in the midst of the Cold War and in response to the Soviet Union launching the first space satellite, *Sputnik*, the U.S. government created the Advanced Research Projects Agency (ARPA) within the Department of Defense to develop forward-looking technology with military applications. By 1966, the group had launched ARPANET, a small network of government and university computers that pioneered the use of "packet switching" to break down messages into small data packets before sending them separately along different routes to be reassembled by the receiving computer (see Figure 2.5). Although this technology was seen as potentially enabling military communication to continue should a nuclear attack destroy one or more nodes in the network, it instead became an essential element of the internet.

FIGURE 2.5 ■ Internet Packet Switching



ARPANET went online in 1969, at first linking four universities. In the 1970s, researchers worked out the standard language and protocols that would be used by all computers wanting to connect to the network. By 1975, more than 50 university and government sites were networked, and the pace of growth increased. In 1983, ARPANET was split in two, resulting in MILNET, for military uses, and NSFNET—under the control of the National Science Foundation (NSF)—for civilian uses. Under NSF guidance, standardized communication protocols that regulate the size and flow rate of data packets were officially adopted, enabling any computer to connect to the growing internet. The NSF supported the national "backbone" of this network, free of charge.

Once the military uses of the internet were separated from civilian uses, government financial support came with relatively few strings attached. This enabled early developers to work without the pressures of commercial market forces while acting on their optimistic "technocratic belief in the progress of humans through technology" (Castells 2001:61; Kahn and Kellner 2004). Within this context, a subculture of computer enthusiasts promoted principles such as sharing, openness, decentralization, and free access to computers (Jordan 2008; Levy 2010). Their efforts were the foundation for later "open source" and "free software" movements.

In its early years, using the internet was generally limited to engineers, computer scientists, and others who possessed specialized computer skills. That changed when Tim Berners-Lee, a British scientist at the European Laboratory for Particle Physics (known as CERN) in Switzerland created a user-friendly network interface and freely released it into the public domain. Launched in 1991, this "World Wide Web" created the familiar *www* at the beginning of web addresses and used hypertext to enable "point-and-click" navigation, making it much easier for people to use the internet's growing archive of resources.

Also in 1991, the U.S. Congress passed the High Performance Computing and Communication Act, authored by then–U.S. Senator Al Gore, to expand the publicly funded infrastructure that was becoming popularly known as the "information superhighway." Shortly thereafter, the NSF issued an "Acceptable Use Policy" for NSFNET, confirming that its services were provided to "support open research and education." The research arms of commercial firms could also use it but only "when engaged in open scholarly communication and research" (National Science Foundation 1992).

As the potential of the internet to reach the general public became increasingly clear, businesses began operating their own private networks, and investors sought to use the internet for commercial purposes rather that public ones. Back in 1988, the NSF had already begun discussions about commercial access to the internet and sponsored a series of conferences on "The Commercialization and Privatization of the Internet." As media scholar Robert McChesney (1999) points out, "No one really had a firm sense . . . of what exactly, if anything, the privatization of the Internet would mean for individual users" (p. 130), and there was little public input into the process. Still, the transition happened quickly; by 1995, the NSF stopped funding NSFNET, and internet connectivity became the exclusive domain of private firms.

The Internet Grows Up

As the internet "grew up," the excitement over the potential money to be made became frantic in the latter half of the 1990s, contributing to wild investment in new "dot-com" companies that drove the U.S. stock market to unprecedented levels. But consumers at the time were not interested in buying groceries (webvan.com), kitty litter (pets.com), or sporting goods (mvp.com) online. As a result, many much-hyped companies collapsed, and the dot-com "bubble" burst in 2000, sending the stock market plummeting.

As the internet gained a greater foothold in society in the 2000s, more emphasis was placed on how this technology could enable users to customize, create, and share content rather than simply shop online. Web 2.0, one of the names given to highlight this collection of interactive capacities, suggested a technological change from the earlier internet. New technologies

enabled the rise of blogging, social-networking sites, content platforms such as YouTube, collaborative wikis such as Wikipedia, early multiplayer role-playing games such as *World of Warcraft*, and virtual worlds such as *Second Life*.

In fact, Web 2.0 did not reflect any substantial change in the technological capacity of the internet. Instead, Web 2.0 was a concept coined in 2004 to indicate a shift in how software developers and users utilized the existing medium (Scholz 2010). Part of this was marketing hype; in the wake of the dot-com bust, developers had to convince investors that there was something new and fundamentally different about Web 2.0 that made it a better and safer investment than the failed dot-com era. Just as radio and television use evolved over time, Web 2.0 highlighted and developed capabilities of the internet that had existed since its inception. This is another example of how changes that result from social forces have been popularly and erroneously understood as being the result of technological innovations.

The world of internet connectivity was enhanced by the growth of mobile devices, including laptops, tablets, and especially, smartphones. The ease with which users could now access these devices—and the internet—meant they could be easily integrated as an omnipresent element of daily life. The emerging innovations in wearable technologies and the "internet of things (IoT)" suggest this integration of internet with daily life will only increase in the coming years.

Some Characteristics of the Internet Era

As with other media technologies, the internet did not travel in a straight line from introduction to mass adoption. Instead, as we have seen, the current version of the internet is the result of complex social processes, involving government funding, the culture of computer enthusiasts, commercial interests, and user preferences. But the technological infrastructure of today's internet—much of which remains invisible to users—has several unique features with significant social consequences.

First, the internet was designed and built to be an open, decentralized platform, accessible to anyone using its basic language and protocols. Unlike, say, cable television, it was not a private, commercial venture controlled by industry corporations. Instead, its creation was funded by research grants, it accommodated projects that were not commercially viable, and its pioneers encouraged a culture of public service. This enabled early internet pioneers to experiment and innovate at a rapid pace, tackling the enormous challenges they faced in creating a new medium. Some of the solutions they found for these challenges still shape how the internet operates today.

Second, the internet's structure was designed to give users considerable control over their experience; it is a nonspecialized platform made to accommodate whatever the user wants to do. This changes interpersonal communication by enabling user interactivity regardless of location. We can video chat with a friend across the globe or tweet back and forth with people in different locations. As we saw in Chapter 1, this sometimes blurs the distinction between interpersonal and mass communication, supplementing the one-to-many model of traditional mass media with the possibility of a many-to-many network of communication. In addition, unlike with traditional broadcast media defined by a set program schedule, internet users decide what content to access and when. More important, people with relatively modest financial resources

and basic technological literacy can use low-cost digital media tools to create and share original content. The requirements for such a task are still insurmountable hurdles for a majority of the world's population, but the creation of widely sharable media content is within the grasp of more people than ever before.

Third, the internet is the first medium to embody *digitization*—the shift from analog to digital media—and *convergence*—the blurring of boundaries among types of media. Analog media exist across largely unbridgeable material divides. The technologies underlying print on paper, sound pressed into the grooves of vinyl records, and images chemically developed on celluloid film, for example, each work in their own distinct ways, and don't mix together easily. In contrast, digitization enables print, sound, images, and video to be recorded, copied, stored, and transmitted in a single universal language: the 1s and 0s of computer code. This common digital foundation is what enables your computer, television, or smartphone to access text, images, video, and sound and to "talk" with other digital devices. Such code can be easily copied and shared, making media content abundant. Digitization sets the stage for convergence, where previously distinct forms of media now blur. "Newspapers," for example, don't need paper, but they can post print stories with interactive graphics and embedded videos on their websites. Over the past few decades, the growth of digital media, the rise of the internet, and the proliferation of mobile devices have combined to burst open the very meaning of media (Bolter and Grusin 2000; Lister et al. 2009).

Finally, the internet is a global system of communication whose governance structure transcends the regulatory reach of any single country. The result is vast gray areas of law and custom. For example, nation-states can impose regulations or even close off parts of the internet, but it is difficult to be completely effective in doing so. Intentionally designed to survive the shutdown of any particular node, the internet's decentralized structure offers many possible work-arounds for tech-savvy users. So who should have unfettered access to the internet? Who can regulate and control it in the face of cyber criminals and other nefarious users? As more of our world is connected to the internet and dependent on it—not only individuals but energy grids, banks, schools, and the media—how can security be enhanced while maintaining the flexibility and openness of the internet? The sprawling reach of the internet raises many such questions and concerns, even while it still offers some of the hopes envisioned by its pioneers.

CONCLUSION

As we have seen, the last century has featured a series of disruptive innovations in communications technology, including the telegraph, telephone, radio, film, television, cable TV, and the internet. Media scholar Tim Wu (2011) argues that there is some similarity to the evolution of these new technologies. At first, he notes, the introduction of an innovation begins a period of idealistic experimentation. Often, the new technology is touted as providing significant altruistic or even utopian benefits for society. However, Wu continues, when the new technology threatens to displace or render obsolete older technologies and their reliable revenues, traditional technology companies seek to control it. They tame the experimental uses of the technology, standardizing it in a closed form that can be centrally controlled—and more efficiently

tapped for profits—all in the name of a better user experience. The government is often enlisted to help by regulating against any new competition. Social and economic forces reassert themselves, and the field yields to the control of a few major corporate players. Over time, though, the novelty of the new technology wears off, users become familiar with its flaws and limitations, and dissatisfaction grows. Protected from real competition, the closed industry becomes stale and is ripe for challenges by new players promoting new technology.

Crucially, Wu makes clear that there is nothing inevitable about what he calls "The Cycle" of technological innovation. Instead, key players—including inventors, corporate executives, government regulars, and users—each make decisions and take actions that bring about the changes.

Arguably, the process continues today as debates swirl between public interest advocates and major media corporations concerning the direction the internet should take. As Wu observes, "It may be true, today, that the individual holds more power than at any time in the past century, and literally in the palm of his hand. Whether or not he can hold on to it is another matter" (p. 299).

DISCUSSION QUESTIONS

1. Explain the differences between technological determinism and social constructionism.
2. What are some examples that show how human agency shapes the development and use of technology? What are some examples suggesting that technology may sometimes influence society?
3. In what ways have the use of electronic media, especially television and the internet, changed social life? What changes do you think might be coming in your lifetime?
4. What have been some of the most important advantages to the rise of the internet and the expanded use of mobile devices? What are some of the potential negative consequences of these changes?