Anytown, U.S.A., 1905: a family and several neighbors stand in the parlor of a modest home, staring with equal parts curiosity and skepticism at one of the technological marvels of the day. Staring back at them is the unblinking eye of a megaphone-shaped brass horn. It protrudes about two feet from a small wooden cabinet with a crank on one side and a felt-covered metal plate on top. The marvel is a phonograph, or “talking machine,” as it was commonly called.¹

The gentleman of the house takes a heavy black disc, grooved on one side and smooth on the other, and places it over the spindle with the label facing up. He turns the crank a dozen or more times, gingerly sets the needle on the outermost groove, and hurries back to his chair. Everyone stares at the phonograph in eager anticipation. The disc spins quickly, and above the whooshing and crackling the machine begins to sing. It sounds to them like actual voices and instruments, albeit in miniature. It is hard to believe that little more than a needle and a record can bring the performers to life, just as if they were right there in the parlor.

After three minutes of rapt attention, the small audience breaks into
FIGURE 1  Girl listening to phonograph, ca. 1900. © 2010 Corbis.
spontaneous, unselfconscious applause and calls for more. Before the man can replay the record, a small child runs to the machine, peering under the table and jumping up to look into the horn. Everyone laughs when it becomes clear that the boy is looking for the musicians! After each record is played several times, the crowd disperses, with everyone wondering if wonders will never cease.2

This quaint vignette may seem unremarkable, but it reveals a revolution in the making. Those gathered around the phonograph were experiencing music in ways unimaginable not so many years before. They were hearing performers they could not see and music they could not normally bring into their homes. They could listen to the same pieces over and over again without change. And they ultimately decided what they were to hear, and when, where, and with whom. All of this was made possible by the distinctive characteristics of sound-recording technology. This is a crucial point: as I explained in the introduction, if we understand the nature of recording, we can understand how users have adapted to, compensated for, and exploited the technology. It is in these actions that we discover the influence of recording; it is here that we find phonograph effects.

Each of the following seven sections examines a distinctive and defining trait of sound-recording technology. This chapter is intentionally broad, moving quickly and often between written and oral musical cultures, East and West, popular and classical, the late nineteenth century and the early twenty-first. Such breadth is imperative, for the impact of recording is strongly shaped by the time, place, and cultural context in which the technology is used. Phonograph effects, as we will see, are not simply technological phenomena.

TANGIBILITY

Before ever setting needle to groove, the operator of the phonograph in that Anytown parlor encountered one of the most remarkable characteristics of recorded sound: its tangibility. Taking the disc out of its paper sleeve, he held the frozen sound in his hands, felt the heft of the thick shellac, saw the play of light on the disc’s lined, black surface. He was holding a radically new type of musical object, one whose very physicality led to extraordinary changes in the way music could be experienced.
Prior to the invention of the phonograph, Karl Marx observed what must have seemed to be an unchangeable truth about music. “The service a singer performs for me,” he noted, “satisfies my aesthetic need, but what I consume exists only in an action inseparable from the singer, and as soon as the singing is over, so too is my consumption.”

When sound is recorded and preserved in a physical medium, however, the listener’s consumption need not end when the singing is over, for the music can be separated from the performer and be replayed without the artist’s consent. Indeed, the portability and repeatability of recorded sound—two of the technology’s crucial attributes discussed later in this chapter—derive from its tangibility. Yet tangibility is not simply a “meta-trait.” In itself the material preservation of sound—“the stockpiling of music,” in Jacques Attali’s arresting phrase—deeply influences the consumption and production of music. To understand this influence let’s consider, first, the practice of record collecting, and second, the physical differences between cassette tapes and compact discs; both implicate the tangibility of recorded sound in distinctive and fascinating ways.

In some ways, record collecting is nothing new, simply an extension of the centuries-old practice of acquiring music-related objects. A recording, however, offers something different: not the means to create music, as in instruments or scores, and not mementos of performers or performances, as in autographs or concert programs—but sound itself. In the early years, recordings were often said to “bottle up” sound, with the phonograph serving to uncork the liquid inside. In 1877, the New York Times proposed that in the future people would seek out cylinder recordings of the great speeches of the day, just as they might collect fine wines. “Whether a man has or has not a wine cellar,” the editorial suggested, “he will certainly, if he wishes to be regarded as a man of taste, have a well-stocked oratorical cellar.”

Unlike wine collecting, record collecting was not the exclusive province of the elite. Because recordings were relatively cheap and plentiful, the phonograph made musical connoisseurship an activity available to the masses. With the broadening of musical connoisseurship, certain extremes of behavior came to the fore. Record collecting has long been described (affectionately, for the most part) as an illness or addiction; if musical epidemiology were a field, record collectors would be an ideal case group. In 1924, the British magazine Gramophone playfully warned of “gramomania,”
alerting readers to its “insidious approach, its baneful effects, its ability to destroy human delights.” Two years later, on the other side of the Atlantic, the Phonograph Monthly Review asked readers to recount their most dire sacrifices in the name of grooved shellac. One contestant, with the self-deprecating pseudonym “Adam Pfuhl,” spun a woeful tale of spending all the money for his family’s Christmas presents on records; another told of literally selling his shirt to support his habit. Appropriately—or perhaps not—the winning contestants received gift certificates for records. Nick Hornby’s 1995 novel High Fidelity demonstrates that the disease is far from eradicated. Rob, the owner of a secondhand record shop and a passionate collector of pop music discs, sympathetically observes the habits of his more obsessive customers:

You can spot the vinyl addicts because after a while they get fed up with the rack they are flicking through, march over to a completely different section of the shop, pull a sleeve out from the middle somewhere, and come over to the counter; this is because they . . . suddenly sicken themselves with the amount of time they have wasted looking for something they don’t really want. I know that feeling well: . . . it is a prickly, clammy, panicky sensation, and you go out of the shop reeling. You walk much more quickly afterward, trying to recapture the part of the day that has escaped.

In the world of hip-hop, hunting for records is known as “digging in the crates,” a reference to the way in which discs are typically stored and displayed in secondhand stores and thrift shops. (As we will see in chapter 6, digging is a way of life among hip-hop DJs because their creativity is judged in part on their ability to find rare, unusual, and catchy tracks.) The 1992 rap song “Diggin’ in the Crates,” by Showbiz and A.G., makes it clear that this activity is as addictive as any form of collecting: “Buying old records is a habit / You know I’ve got to have it.” The darker side of this addiction comes out in Pearl Jam’s 1994 ode to the vinyl disc, “Spin the Black Circle,” whose mention of “ritual,” “needle” and “crooked arm” suggest a parallel between playing records and shooting up heroin.

Such addictions are directly connected to the materiality of recorded music because it is often the physical artifacts themselves, more than the sound of the music, that collectors find meaningful. In speaking of his records, High Fidelity’s Rob explains, “This is my life, and it’s nice to be able
to wade in it, immerse your arms in it, touch it.” Clearly, record collecting involves more than music. Collecting is about the thrill of the hunt, the accumulation of expertise, the display of wealth, the synesthetic allure of touching and seeing sound, the creation and cataloging of memories, and the pleasures and dangers of ritual. Record collecting represents a relationship with music that helps us, in some part small or large, to articulate and, indeed, shape who we are. The relative affordability of these musical objects is also significant, and has affected all types of listeners, whether the sweaty-palmed disc junkie or the casual consumer. Recordings are often (though not always) cheaper than tickets for concerts of the same fare, and their affordability may affect listeners’ access to music. As chapter 2 will show, the inexpensive disc was hailed as one of the keys to helping America become a more “musical” nation in the first decades of the twentieth century, for cheap records of the classics meant that access to “good music” need not be the exclusive domain of the rich. And one of the crucial issues in the debate over file-sharing—which I explore in the book’s final chapter—is that these sound files are being collected by the millions free of charge, much to the delight of many listeners and to the outrage of the recording industry. But as I will explain, MP3s and the like are a special case, for they are not tangible in the way traditional media are. The tangibility of recordings clearly affects how music is consumed. Less obvious is how this tangibility influences the way music is made. Consider the cassette tape. Developed in 1963 by the Dutch company Philips, the small plastic cassette was markedly different from its predecessor, the long-playing record. Perhaps most important was that its physical characteristics made recording and duplication much easier and cheaper than had been possible in the LP era. As the ethnomusicologist Peter Manuel asserts in his 1993 book *Cassette Culture*, these attributes have led to enormous changes in music and musical life. One compelling case in point, the focus of Manuel’s research, is North Indian popular music. Before 1978, cassettes were rare in India (LPs being dominant), and a single entity, the Gramophone Company of India (GCI), controlled the nation’s recorded music. GCI’s monopoly led to an extreme concentration of performers and styles. Most of its releases were of a particular type of love song, an adaptation of the classical ghazal form, updated for use in films; moreover, these songs—which even to fans tended to sound similar—were recorded by just a handful of long-lived
singers. Reliable figures are scarce, but the most famous “playback singers,” Asha Bhosle, Lata Mangeshkar, and Mohammed Rafi, have each recorded at least five thousand songs; some claims put their output in the tens of thousands. The resulting homogenization of Indian popular music is hard to comprehend. Imagine that for fifty years much of the popular music in the United States consisted of countless variations on “I Will Always Love You” (featured in the 1992 movie The Bodyguard), hundreds of which were recorded by Whitney Houston. When one critic quoted by Manuel complained of “the crushing power of the monotony of musical soundscape” in India, we should not take this to be hyperbole.

In the 1980s, the government relaxed regulations on the importation of cassettes, and they quickly came to account for 95 percent of all commercial recordings in India. The arrival of the cassette utterly changed the pop scene. The less complex, cheaper medium allowed smaller labels and even individuals to create and distribute recordings, ending GCI’s stranglehold on the market. This diversification brought new perspectives, giving rise to new stars, even new musical genres. And it was precisely the physical characteristics of the cassette, tangibly different from the LP, that helped prepare the ground for this revolution.

We must be careful, however, not to assume that ease of production necessarily leads to diversification. Remarkably, the cassette seems to have had very nearly the opposite effect on the gamelan tradition of Java. Traditionally, each gamelan is a unique and matched collection of largely brass and bronze percussion instruments, with each ensemble having its own distinctive tuning. Although gamelans had been recorded in the early twentieth century, it was not until cassettes came ashore in the late 1960s that recordings circulated widely across the island, and this was precisely because they were so simple to produce and disseminate. One striking effect of the new medium was that it seemed to facilitate a certain standardization within the world of gamelan performance practice. In his fieldwork in Java, the ethnomusicologist Anderson Sutton observed gamelan teachers changing the patterns and structures of certain pieces to match what they had heard on cassettes recorded by prominent ensembles. It has also been reported that when new gamelans are made nowadays they are often tuned to match a frequently recorded ensemble.

Whereas the advent of the cassette led to musical diversification in North
India, it encouraged musical homogenization in Java. One reason for this difference is fairly clear: where the Indian music industry was monopolized by a single, giant corporate entity, no such market concentration existed in Java. The contrast between these “cassette cultures” illustrates a point I have already made, but one that bears repeating: phonograph effects are not dictated solely by the traits of the technology. We see here how socioeconomic factors can alter the relationship between a technology and its users, with seemingly contradictory phonograph effects arising from the same medium. Nevertheless, we can see that the cassette cultures of India and Java both illustrate how a tangible difference between recordings and live performance can have a profound impact on music and the way we interact with it.

PORTABILITY

When music becomes a thing it gains an unprecedented freedom to travel. Of course, live and recorded music are both portable, but in different ways. The portability of live music depends on the size of instruments and the number of musicians needed to perform a work. Minstrels and marching bands move easily; orchestras and anvil choruses less so. With recording, however, all music is more or less equally portable, from harmonica solos to the massive works of Mahler.

Furthermore, when music is recorded and replayed, it is removed from its original setting, losing its unique spatial and temporal identity. This loss is the subject of Walter Benjamin’s famous 1936 essay “The Work of Art in the Age of Mechanical Reproduction.” Although the visual arts concerned Benjamin most, his ideas are relevant here. “Even the most perfect reproduction of a work of art,” he maintains, “is lacking in one element: its presence in time and space, its unique existence at the place where it happens to be.” Reproductions, therefore, are missing what he calls the “aura” of the artwork. This is all for the good as far as Benjamin is concerned. He celebrates the “withering” of the aura, declaring, “for the first time in world history mechanical reproduction emancipates the work of art from its parasitical dependence on ritual.” Freed from its often exclusive and restrictive rituals, he suggests, art would be more accessible to the masses. Benjamin was certainly right about the increased accessibility of mass-reproduced art, yet he was wrong about the emancipation from ritual. Reproductions, no longer
bound to the circumstances of their creation, generate new experiences, traditions, and indeed rituals, wherever they happen to be.

Consider the *picó* of modern-day Cartagena, Colombia. A *picó* is a large, elaborately designed sound system used to supply music for dance parties. Owners take great pride in their fancifully adorned *picós*, which they often parade through their communities in the back of pickup trucks, competing with one another to display the loudest, most extravagant system. Although the *picó* is native to Cartagena, the music it plays is not. The records, having arrived with traveling sailors, are mostly of African and Afro-Caribbean genres whose sound and language are foreign to coastal Colombia. Listeners do not typically understand the lyrics, and any dances originally connected with those genres are severed from the music. Yet the music is deeply meaningful to Cartagenos, and is central to the pleasures and experiences of *picó* culture. As the *picó* demonstrates, while recorded music is often decoupled from its origins in space and time, this “loss” begets a contextual promiscuity that allows music to accrue rich and unexpected new meanings.

Globetrotting recordings have also been deeply meaningful to composers and have changed, and even started, many careers. For the bandleader and composer Alton Adams (1889–1987), hearing 78s of the American “March King,” John Philip Sousa, was a formative experience. As a young man living in the Virgin Islands, he had no other access to this music. “How well do I still recall,” he wrote late in his life, “the many hours I spent in rhapsodic ecstasy listening outside the residence of . . . a kindred spirit who was playing Sousa marches on his phonograph player. At that time, those sporadic phonograph concerts were not mere musical treats to me. They were like manna from on high, feeding a hungry, searching musical soul. After each of these musical experiences, stretched on my bed, I would then imaginatively conduct a Sousa’s band in one of my own compositions.”

Adams, a black composer living in a black society, was deeply moved by the recordings of a white musician. Darius Milhaud, a white European, found great value in the discs of black jazz musicians. “Thanks to the phonograph,” he wrote in 1924, “I will be able to play the discs of black music—recorded and published by blacks—that I brought back from the United States. It is truly very precious to be able to study the folklore of all the world thanks to this machine.” Records, and with them musical influence, traveled not only from north to south and west to east, but from east to west as well. Hearing
discs of Balinese gamelan music in 1929 proved decisive to the career of the Canadian composer Colin McPhee, leading to his move to Bali in 1931 and his immersion in its music and culture. Recordings of African music in the 1950s made a similar impression on Steve Reich, and indirectly led to his visit to Ghana and to his 1971 work *Drumming*.

For a broader, and particularly rich, example of the cross-cultural exchange of records and technology, consider the symbiotic relationship between American and Jamaican popular music. During World War II, American sailors stationed on the Caribbean island introduced Jamaicans to R&B. The sailors eventually left, but a taste for the music developed. “As the years passed,” Dick Hebdige explains in *Cut ‘n’ Mix*, “the demand for black American R&B in Jamaica grew stronger. But there were no local groups that could play the music competently. So large mobile discotheques called ‘sound systems’ were set up to supply the need.”

The fiercely competitive sound-system DJs (who called themselves selectors) were always searching for records unknown to their rivals, and often made trips to the United States for the purpose. But over time, homegrown versions of American R&B began to take root as local musicians cut instrumental cover versions of American songs, or original instrumentals in that style. These early recordings, called *rudie blues*, were not for sale; rather, prominent sound-system operators commissioned them to one-up each other in epic contests known as clashes. To greatly simplify a complex story, rudie blues eventually developed into ska, dub, and then reggae as vocal accompaniment and generous helpings of reverb were added.

Just as reggae was coming into its own in the late 1960s, a family from Kingston, the Campbells, relocated to the Bronx, New York. The boy of the family, a giant named Clive, became a DJ; known as Kool Herc (short for Hercules), he drew on the Jamaican style by creating a monstrous sound system, favoring obscure discs, and clashing (or battling, as it was called in the Bronx) with any rivals willing to take him on. Herc’s Jamaican-influenced DJing came to play a central role in a new type of music that arose in the Bronx of the early 1970s: hip-hop. In 1979, New York returned the favor: “Rapper’s Delight,” one of the first hip-hop records, quickly crossed the fifteen hundred miles between New York and Kingston, where the Jamaican reggae musician Joe Gibbs got his hands on it and recorded his own version. Clearly, the portability of recorded sound was a necessary precondition for
the flourishing of reggae and hip-hop; but more than that, these two record cultures, as I would call them, simply would never have existed without each other and the mutual exchange of black discs and black music across the Caribbean Sea.  

Even when recordings aren’t winging their way across vast expanses, they can move easily within our daily lives, detaching music from its traditional times, venues, and rituals. Not all were sanguine about the new possibilities the technology allowed. In 1907, the City Council of Portland, Oregon, proposed an ordinance that sought to put a halt to the playing of mechanical music at ungodly hours: “It shall be unlawful within the limits of the City of Portland,” the proposal states, “for any person to operate or cause to be operated any automatic or electric piano, phonograph, graphophone or any instrument of like character between the hours of ten o’clock P.M. and seven o’clock A.M.”

Of course, ragtime blasting from the neighbor’s Victrola in the wee hours might simply have been regarded as a nuisance. But the resistance to other new ways of experiencing music cannot be similarly explained. Consider a different listening habit made practicable in the age of the phonograph. In 1923, Orlo Williams wondered how one might react upon walking in on a friend who is listening to recorded music . . . alone. His answer illustrates the puzzlement that may once have met what is now a widespread practice.

You would think it odd, would you not? You would endeavour to dissemble your surprise: you would look twice to see whether some other person were not hidden in some corner of the room, and if you found no such one would painfully blush, as if you had discovered your friend sniffing cocaine, emptying a bottle of whisky, or plaing straws in his hair. People, we think, should not do things “to themselves,” however much they may enjoy doing them in company: they may not even talk to themselves with out incurring grave suspicion. And I fear that if I were discovered listening to [Beethoven’s] Fifth Symphony without a chaperon to guarantee my sanity, my friends would fall away with grievous shaking of the head.

Even if a bit melodramatic, Williams’s remarks remind us that before the advent of recording, listening to music had always been a communal activity. In prephonograph times it had been for the most part neither practical nor
possible to hear music alone. Listening was a culturally significant activity, for music accompanied central communal events, including birth or death rites, weddings, and religious festivals. Solitary listening, then, contradicted centuries of tradition. Nevertheless, the practice came to be accepted. A 1931 editorial in the magazine Disques touted its advantages: “Alone with the phonograph, all the unpleasant externals are removed: the interpreter has been disposed of; the audience has been disposed of; the uncomfortable concert hall has been disposed of. You are alone with the composer and his music. Surely no more ideal circumstances could be imagined.”

A few years earlier an American critic offered a specific example of such an “ideal circumstance.” “A man may hear Beethoven’s Ninth Symphony in concert and be awed. But if he plays a part of the Columbia recording every morning while he is shaving, he will be less reverent, perhaps, but the music will mean a thousand times more to him.”

Today, solitary listeners are everywhere, both in the privacy of their homes and out in the world. But there is—or at least should be—something strange about seeing people in public places, earphones practically implanted into their brains, nodding or singing along to their own private music. Journalist Paul Fahri wonderfully captured that strangeness, evoking images from the classic horror movie Night of the Living Dead: “It is so familiar now that we don’t see or hear it anymore. It is the look and sound of the Walkman dead: the head cocked at a slight angle, the mouth gently lolling. From about the skull comes a tinny low buzzing sound, like metallic bees. The eyes flicker with consciousness, but they don’t see. They’re somewhere else.” Perhaps we should wonder not that solitary listening was once considered unusual but rather that it should have come to be so widely, unremarkably practiced. The same is true for the act of listening to music far removed from one’s home or culture or of experiencing music whenever and with whomever one wishes. In each case, the portability of recording has made the once unimaginable commonplace.

(In)Visibility

Imagine that it is 1916 and you are shopping for records. Upon entering a store you are invited to take what is called “The Edison Realism Test.” You are led to a quiet spot where you find a phonograph, a chair, and a scrapbook,
and are handed a sheet of paper with a set of six instructions (figure 2). First, you are to choose the type of music you would like to hear. Next you are asked to sit facing away from the phonograph while looking at a scrapbook of concert reviews and photographs of musicians (all Edison recording artists, naturally). Then you are directed to remember the last time you witnessed a performance of the music you have chosen to hear. “Picture the scene,” you are told, until “it is clearly . . . in mind.” Once this mental image is firmly in place, you are to say, “I am ready,” at which point the demonstrator plays your chosen record. The final instruction is wonderfully complicated: “About forty-five seconds after the music begins, close your eyes and keep them closed for a minute or more. Then open your eyes for fifteen seconds but do not gaze at your surroundings. After this, close your eyes again and keep them closed until the end of the selection.” If you follow these directions exactly, you will supposedly get “the same emotional re-action experienced when you last heard the same kind of voice or instrument.” If for some reason you do not, it is because “you have not wholly shaken off the influence of your surroundings,” in which case you are to repeat the test until successful.31

What is fascinating about the Edison Realism Test—essentially a set of instructions for how to listen to a phonograph—is the importance given to the visual dimension of the musical experience. Listeners must go to great lengths not only to conjure up the correct mental imagery, but also to avoid all possible conflicting stimuli. The assumption behind the test is clear: in order for recorded music to be comprehensible, listeners must visualize a performance. Seeing was indeed believing. In fact, this had always been true, as the musicologist Richard Leppert makes clear in The Sight of Sound: “Precisely because musical sound is abstract, intangible, and ethereal—lost as soon as it is gained—the visual experience of its production is crucial . . . for locating and communicating the place of music and musical sound within society and culture.”32

The Edison Realism Test reveals another little-appreciated fact about recorded music: that listeners and performers cannot see one another.33 Although unremarkable today, this was once a source of great anxiety. As an English music critic explained in 1923, some listeners “cannot bear to hear a remarkably life-like human voice issuing from a box. They desire the physical presence. For want of it, the gramophone distresses them.”34 This anxiety
EDISON REALISM TEST

1. State what kind of voice (soprano, tenor, etc.,) or kind of musical instrument you wish to hear.

2. Sit with your back toward the instrument.

3. Spend two minutes looking through the scrap book which will be handed to you by demonstrator.

4. Then select one of the clippings at random and read it carefully.

5. Having read the clipping, recall the last time you heard the kind of voice or instrument which you have asked to hear. Picture the scene. When it is clearly in your mind, say to the demonstrator, “I am ready.”

6. About forty-five seconds after the music begins, close your eyes slowly and keep them closed for a minute or more. Then open your eyes for fifteen seconds but do not gaze at your surroundings. After this, close your eyes again and keep them closed until the end of the selection.

**Result** You should get the same emotional re-action experienced when you last heard the same kind of voice or instrument. If you do not obtain this re-action at the first test, it is due to the fact that you have not wholly shaken off the influence of your surroundings. In that case you should repeat the test until you are no longer influenced by your surroundings.

is understandable, for voices are typically accompanied by bodies—in fact, “hearing voices” without seeing their source is a sure sign of an unwell mind.

Various strategies were employed in the attempt to restore the missing visual dimension to the phonographic experience. The Stereophone and the Illustrated Song Machine, both introduced in 1905, consisted of similar mechanisms that, when attached to cylinder-playing phonographs, rotated images in time with the music. As an article in a trade journal crowed, the Illustrated Song Machine “is just what the public has wanted since the first automatic machine [i.e., phonograph] was placed on the market, and the listener drew a mind’s picture as the words and music were repeated to him.” In 1929, a British phonograph enthusiast reported on the miniature stages he had constructed to look at while listening to his favorite operas. He meticulously fashioned scaled-down sets and wooden cutouts of characters in various costumes, all of which he changed with every new scene. In the United States, the music educator Albert Wier devised what he called the “projecting phonograph” in 1936, for use in music classes. Wier created slide shows in which main themes or motives, graphic analyses, translations of texts, and images of musicians or opera sets were projected in time with recordings. In the absence of these rather extravagant remedies, listeners simply stared at their phonographs—a practice that was, as one observer noted in 1923, “an unthinking inheritance from the days when we had no phonographs, and when we naturally had to look at the performer.”

When musicians record, their invisibility to listeners removes an important channel of communication, for performers express themselves not only through the sound of their voices or instruments but with their faces and bodies. In concert, these gestures color the audience’s understanding of the music. As Igor Stravinsky rightly explained, “The sight of the gestures and movements of the various parts of the body producing the music is fundamentally necessary if it is to be grasped in all its fullness.” Put another way, live music is a multimodal experience, one whose perception involves input from more than one of our senses. The violinist Itzhak Perlman, for example, is effective in concert in part because his face registers and reinforces every expressive nuance in the music. Perlman himself once remarked that “people only half listen to you when you play—the other half is watching.” (See the companion Web site, audio/visual file 1, for a film of Perlman in performance.) The visual aspect of performance is especially
important for pop musicians. What would pop be without the wriggling and jiggling, the leaping and strutting, the leather and skin, the smoke and fire? It would be merely sound, and so much the poorer for it.

The power of the visual is even clearer when the audio and visual channels are at odds with each other. Consider the violinist Jascha Heifetz, known for his blank expression when performing. A 1925 article remarked on his deportment: “Cold, calm, dispassionate, he stands on the platform and performs miracles of dexterity, displays his beauties of tone; but do we not feel slightly chilled, anxious perhaps for less mastery and more humanity?” (See the companion Web site, audio/video file 2, for a short film of Heifetz in concert.) Yet the author also noted that Heifetz sounded rather different on disc: “These impressions are to some extent corrected by Heifetz’s records. There is certainly a hint of passion, of tenderness.” In other words, with the visual channel off, when the experience of his playing was no longer multimodal, but monomodal, Heifetz no longer seemed emotionless. Heifetz’s playing provides a musical analogue to what is known as the McGurk Effect. In a 1976 experiment, the psychologists Harry McGurk and John MacDonald showed subjects a video of a young woman speaking certain syllables while the subjects heard different syllables dubbed onto the tape. The results were striking: the subjects, who could readily identify the syllables being spoken when not looking at the video, consistently misidentified the sounds when the video presented conflicting information. For example, if a video shows a person saying the syllable “ga” but the audio plays “ba,” viewers almost always insist that they hear the syllable “da”—even after they know what is actually being spoken. (See the companion Web site, audio/video file 3, for the McGurk Effect.) The psychologists’ conclusion, which Heifetz had demonstrated long before, is that what we hear is deeply influenced by what we see.

The kind of mismatch between sight and sound demonstrated by the McGurk Effect has had real-world consequences. Take the case of Milli Vanilli, a pop duo whose good looks and provocative dancing gained them a huge following in the late 1980s. They fell from stardom, however, when it was revealed in 1990 that all along they had lip-synched to the recordings of two unknown performers; the outcry was so great that angry fans filed dozens of lawsuits against them for fraud and their 1990 Grammy Award for Best New Artist was revoked. The real singers, a pair of middle-aged men,
were not considered glamorous enough to be put before the public, suggesting just how crucial a group’s look is to its success. (See the companion Web site, audio/video file 4, for Milli Vanilli lip-synching.) Lip-synching has continued to stir controversy. When pretty nine-year-old Lin Miaoke performed at the opening ceremony of the 2008 Beijing Olympics she was seen by billions but heard by none. The voice singing “Ode to the Motherland” belonged to another girl, seven-year-old Yang Peiyi. The decision to keep Yang out of sight was made because, as the ceremony’s music designer explained, “the child on camera should be flawless.” Yang’s crooked teeth were apparently an unacceptable flaw. In one sense, given the pervasiveness of audiovisual manipulation on television and film, it’s surprising that anyone should be surprised, much less outraged, at such sleight of voice. Yet we seem to have an instinctive expectation of a direct and visible connection between a sound and its source. When that connection is severed, as is always the case with audio recording, or when we are misled about the nature of that connection, as the lip-synching examples demonstrate, we almost inevitably react, often with surprise, sometimes with outrage.

Yet our reactions are not inevitably negative. As the Heifetz example reveals, the absence of the visual can have its own appeal. A 1912 article reprinted in *Voice of the Victor* praised the recorded medium for stripping away all that the author considered unnecessary to the musical experience. “In listening to the Talking Machine,” he explained, “the hearer must of necessity concentrate upon the tonal performance and does not have his attention diverted to extraneous matters, such as scenery, costumes, [and] acting . . . that keep him from directing his faculties to the music itself.” The renowned German social theorist Theodor Adorno agreed, and even argued that the most visual of musical genres—opera—is in fact best heard on recordings, without seeing the costumes and sets. “Shorn of phony hoopla,” Adorno wrote in a 1969 article, “the LP simultaneously frees itself from the capriciousness of fake opera festivals. It allows for the optimal presentation of music, enabling it to recapture some of the force and intensity that had been worn threadbare in the opera houses.”

A musicology graduate student once told me that, for him, the experience of sacred music on disc was powerful precisely because he could not see the musicians; hearing such bodiless music made him feel closer to God. This effect is not new to recording; it is the same achieved by the age-old practice
in many Christian churches of placing the organist and sometimes the choir out of the sight of the congregation. The removal of visual cues, certainly no accident, separates body from sound, heightening the sense that the music comes not from humans but from heaven. In prephonographic times such unseen music was the exception, used for specific purposes. Today, however, given the ubiquity of recorded music, such sightless hearing is closer to the rule. However listeners have responded—whether by compensating for it or by exploiting it—the invisibility of performance is a fundamental part of the modern musical experience.

Ironically, this invisibility can have observable consequences. The conductor Nikolaus Harnoncourt suggested that recording artists must somehow compensate for the missing visual dimension. “If you don’t see the musician—and this is the case with all recordings—you have to add something which makes the process of music making somehow visible in the imagination of the listener.” As I will argue in chapter 4, it is precisely this missing dimension that encouraged classical violinists to “add something” to their playing—in their case, an intense vibrato that helped communicate a sense of physical and expressive immediacy. Sometimes, however, musicians have responded by taking something away. Because recordings provide no visual continuity during extended pauses or tempo changes, musicians may “tighten” the spaces between phrases and larger sections when performing in the studio. The cellist Janos Starker has explained that “while in a concert hall, the performer is able to create tension with rests . . . he cannot do this with recording.” On disc, then, “the presentation of a composition” must “become much tighter.” Eugene Drucker of the Emerson String Quartet has offered a specific example of this “tightening” response. Drucker recounts how, in recording the Schubert Quintet, guest cellist Mstislav Rostropovich encouraged the group to shorten pauses that, in concert, they might normally extend for dramatic effect. For example, “after the big chord in the coda of the first movement [m. 428] . . . we took no extra time for rhetorical effect. Rostropovich pointed out that in a recording, one cannot always afford to play quite as broadly as in a performance. The impact of the performer’s presence, even visually, can flesh out the musical ideas and add interest to phrases that might sound dull on tape.” In concert, the performers would have lifted their bows off the strings after playing the chord, paused for a moment, and slowly returned them for the
following phrase. Such a gesture would have heightened the drama of the moment and visually linked the two chords. On a recording, however, an extended silence like this would simply have been “dead air,” something to be avoided. “This streamlining of approach,” Drucker explained, “is required by recording.”

Does the streamlining of a second here or there really make any difference in the larger scheme? It does. Over the course of the century, there has been a noticeable move in classical performance toward steadier tempos, with fewer and less marked tempo fluctuations. What seems to be a common and almost instinctive “tightening” response has, in part, contributed to this general change in the rhetoric of modern performance.

Recording artists have also reacted to the fact that they cannot see their audiences. For many, the task of performing to unseen listeners, with recording equipment as their proxy, can be both daunting and dispiriting. In her 1997 memoir, the French soprano Régine Crespin registered her dismay at the artificiality of performing in the studio:

Fear of an audience is healthy; it stimulates you. The people are there in front of you. With them there can be mutual lovefests. But how can you fall in love with a microphone? First of all, a microphone is ugly. It’s a cold, steel, impersonal thing, suspended above your head or resting on a pole just in front of your nose. And it defies you, like HAL the computer in Stanley Kubrick’s film 2001: A Space Odyssey, although at least he talked. No, the microphone waits, unpitying, insensitive and ultrasensitive at the same time, and when it speaks, it’s to repeat everything you’ve said word for word. The beast.

The absence of the audience that Crespin laments has affected performers of all types and traditions. Before the era of the phonograph, Hindustani classical musicians not only took inspiration from their listeners but also improvised directly in response to their reactions. The exact sound and shape of the performance, then, was determined in part by the interaction of artist and audience. For those who recorded, one way to compensate was to manufacture an audience, planting enthusiastic listeners in the studio. On an acoustic-era recording of Maujuddin Khan, for example, one can hear a few “plants” shouting “Wah! Wah! Maujuddin Khan! Subhanallah!”
praising the divinity of the singing.\footnote{51} In a more recent example, I myself was an unwitting plant in a recording session for the rock group Rotoglow. After observing from the control room, I was invited to sit in the studio while the band was recording. Squeezed between the lead guitarist and the drummer, I was sure I was a distraction, and after a few songs I volunteered to return to the other side of the glass. To my surprise, the group insisted that I stay. “You’re a part of this, man!” one of them declared.\footnote{52} I hardly acted like a typical rock concertgoer—I sat quietly in a chair, my only actions consisting of taking notes and stuffing my ears with wadded toilet paper. Nevertheless, my presence must have in some way met the band’s need or desire for an audience.

For some, however, the absence of an audience may be welcome, providing respite from the stress and distractions of concert performance. In a classical concert, coughing, snoring, talking, program rustling, and candy-wrapper crinkling may fluster or irritate the performer; at a pop concert audiences may in fact be louder than the performers, and can distract the musicians in any number of other ways. Removing the audience may therefore permit a sharper focus on making music to the artist’s own satisfaction. The violinist Yehudi Menuhin, for one, valued recording for allowing him a “monastic dedication which is oblivious of audience.”\footnote{53} As with every aspect of recording, the mutual invisibility of performer and listener offers both drawbacks and benefits, though in all cases it presents challenges to which both parties must respond.

**REPEATABILITY**

Sing a single note. Now try to recreate that sound exactly—not simply its pitch, but its precise volume, length, intensity, timbre, attack, and decay. Now imagine trying to repeat an entire song in this way, down to the smallest detail. It simply cannot be done. The impossibility of such an exercise reveals what is perhaps the most unbridgeable difference between live and recorded music: live performances are unique; recordings are repeatable.

This statement deserves further explanation. Live music is in fact repeatable, but in the form of works, not performances.\footnote{54} An orchestra can play Beethoven’s Fifth Symphony many times; each performance, however, will necessarily be different. Second, to say that a recorded performance is