Growing up in suburban Los Angeles, I always had a unique embodied relationship to space and how space affected relationships. Los Angeles has a unique way of communicating space to its residents. For me, as with many of those living in the area, relationships were always connected through the roads and highways, thus dependent on automobile travel. As a child, my father would pick me up and drive me an hour to his house in Orange County to spend weekends with him. In fact, any social connection was initiated by getting into the car and traveling. Many years later, as I was working on my Ph.D. at UCLA, I began to translate these spatial gaps to the world of online social networking. As online social networking began to flourish in 2003, I began to connect with people globally and find some very fruitful relationships that simply extended the distance paradigm I grew up with even further. Though there was a significant amount of space between my friends and myself, the means to connect was simply an altered form of getting behind the wheel and driving. Through technology, the spatial gap that existed in every relationship I had known was easily traversed. Connecting globally felt natural.

This mode of connection dramatically changed for me once I began working as a professor in the Pacific Northwest of the United States. It was here that I obtained my first “smart” phone and began to realize that connecting globally took a back seat to connecting to those in my immediate vicinity. Though I was still utilizing my home computer to connect to friends and colleagues across vast distances, I found that I was far more eager to take advantage of proximity when connecting. The early applications for my phone that I found most compelling were the ones that helped me locate friends nearby. I was intrigued by the ability to know if friends or colleagues were at the same coffee shop to which I was about to go. By simply loading a smartphone application, I could decide on which venues
I would visit that evening. Entering into pervasive computing culture, spatial proximity became the primary tenet for my digital interactions.

As I began to explore the emerging uses of my mobile phone, I also began to realize a major shift that was taking place culturally: the spatiality of the internet (i.e., the space of cyberspace) was moving away from the desktop computer and moving out onto the streets. Computing was becoming pervasive. Though I have always felt and argued that connecting with the computer is an extremely embodied experience, the spatiality of cyberspace—which has been theorized since the early 1980s, when William Gibson invoked the term—is being inhabited in a significantly different way with the advent of mobile technologies. With mobile phones that connect to the internet or GPS receivers that are utilized for a wide array of purposes, locating one’s self simultaneously in digital space and in material space has become an everyday action for many people. With this alteration of embodied space, the cultural objects we are producing and interacting with are also being transformed.

Spatial relationships have always determined the way we understand ourselves, our place in the larger context, and the cultural meanings infused into gestures, objects, and sign systems. Spatial proximity and how we locate ourselves in space affects every aspect of the cultural objects we create and interact with. As Nick Kaye writes in the introduction to his book *Site-Specific Art: Performance, Place and Documentation*, “If one accepts the proposition that the meanings of utterances, actions and events are affected by their ‘local position’, by the situation of which they are a part, then a work of art, too, will be defined in relation to its place and position.”1 Throughout this book, I will look at the relationship between the ways we understand embodiment in emerging pervasive computing spaces and how our conceptions of embodied space are informed by works of art including location-based games, performance, and narratives.

My work in this chapter serves as the theoretical foundation that I will build upon in each of the chapters that follows. In order to understand the ways that embodied space is affected by the practices of mobile media, I feel it is essential to develop a solid theoretical framework that informs my study of emerging mobile practices. By spending the entirety of this chapter focusing on my definition of “embodiment,” I hope that my theories of a “sensory-inscribed” body help illuminate what it means for us to experience moments like seeing our location mapped on a mobile device, interacting with others via locative social media, playing games that change our perceptions of a city, experiencing site-specific art and performance on a mobile device, and interacting with spatial histories and narratives with mobile technologies. Hopefully, my approach to embodiment will also find resonance with those outside of the field of mobile media, since the theorization of embodied space applies across areas of interest, across disciplines, and across historical eras. Though I find mobile media to be a particularly useful object of study that informs a reading of embodied space, I think the theoretical approach taken here can find significant portability well beyond the scope of this work.
My theoretical approach does not consider embodiment to be separate from the production of the spaces we inhabit. In fact, even the phrase “to inhabit space” is misleading, since it implies a space that bodies enter and fill. Instead, space is constructed simultaneously with our sense of embodiment. The two are indelibly linked, never to be separated. This conception of embodied space harks back to the famous work by Henri Lefebvre, *The Production of Space*, in which he writes, “Each living body is space and has space: it produces itself in space and it also produces that space.” He goes on to argue throughout his work that space cannot be considered a container that is filled; instead, “space is not a thing, but rather a set of relations between things (objects and products)” and that “space is neither a ‘subject’ nor an ‘object’ but rather a social reality—that is to say, a set of relations and forms.” This idea tends to go against the ways that we speak about space. We often discuss spaces as places we enter, inhabit, move through, and leave. They are there before we arrive and they’ll be there after we leave. However, as I will argue throughout this book, space needs to be considered as something that is produced through use. It exists as we interact with it—and those interactions dramatically change the essential character of space. Similarly, if relational space cannot be considered a container, neither can the body be something we simply inhabit. Again, the ways that we talk about the body often shape the ways we practice embodiment. As N. Katherine Hayles notes, the term “the body” assumes a universalized body, but there are many types of bodies in digital space and various modes of embodiment. She writes in her article “Flesh and Metal: Reconfiguring the Mindbody in Virtual Environments,”

“The body” generalizes from a group of samples and in this sense always misses someone’s particular body, which necessarily departs in greater or lesser measure from the culturally constructed norm. At the other end of the spectrum lie our experiences of embodiment. While these experiences are also culturally constructed, they are not entirely so, for they emerge from the complex interactions between conscious mind and the physiological structures that are the result of millennia of biological evolution.

Thus, spaces and bodies are co-constitutive as they produce one another, and this production must be theorized with cultural and physiological specificity. We don’t all have the same bodies, nor do we have the same experience of embodiment/embodied space.

As we begin to locate what it means to be “embodied,” we must simultaneously ask how bodies are enacted in and with space. Many recent theorists of spatiality point toward a distinction between space and place, the former being an unacted, purely theoretical site, and the latter being the “phenomenal particularization of ‘being-in-the-world,’” as Edward Casey notes. Place is thus an embodied and practiced space as opposed to the purely abstract notion of “space” as that which is an unpracticed place. Casey goes on to note: “It is a striking fact, on which we
do not often enough reflect, that while we can certainly conceive of entirely empty spaces and times—radical vacua in which no bodies (in space) or events (in time) exist—such spatio-temporal voids are themselves placelike insofar as they could be, in principle, occupied by bodies and events.” While it is not my intention in this book to retrace the debates over the distinctions between space and place, it is important to note that any abstract understanding of space as that which can exist before or without bodies is ultimately a pure theorization that is never actualized. Since bodies produce spaces and spaces produces bodies, unpracticed sites and uninhabited spaces must remain purely theoretical concepts. Since embodiment is always co-created alongside space, it must be noted, embodiment is always site-specific to the particular cultures, histories, and relationships that serve as catalysts to such production. One such historical catalyst is the emergence of mobile computing and the ways it has transformed embodied space in the digital age.

Since mobile technologies have reinvigorated our fascination with location and place, an understanding of this emerging space must include a nuanced perspective of embodiment. Drawing primarily from the phenomenology of Maurice Merleau-Ponty and the ways in which his approach intersects and informs the poststructuralist methodologies of Jacques Derrida, I am arguing for an approach to embodiment that is developed out of these two seemingly disparate fields. Out of a detailed exploration of the ways that phenomenology and poststructuralism intersect, I develop a theory of the “sensory-inscribed” body that becomes a lens for all of our interactions with mobile interfaces. For those familiar with the historical relationship and tension between phenomenology and poststructuralism, to find a way of blending the two might seem to do a grave disservice to the integrity and constitution of each methodology. Pulling pieces out of a particular theory without recognizing the role that each piece plays in the larger formation of the theory could likely cause subsequent theories to topple. However, at this point in history, we have come to a place where such a reworking of these theories has become not only important, but also essential to the ways we conceive of embodied space and identity in a digital world.

**Defining Embodiment for a Mobile Era**

To begin to locate embodiment in the mobile media era as that which is “sensory-inscribed,” I want to reiterate the notion that embodiment is always a spatial practice. Trying to imagine a body without space is impossible. Bodies always take up space and, as Lefebvre argued, are spatial in and of themselves. Regardless, throughout the history of technology, we have attempted to distance bodies and spaces as much as possible. This dissection is particularly noticeable in the age of the mobile phone, in which we attempt to dislocate bodies from particular spaces and spaces from particular bodies. As Rich Ling notes, “With mobile communication, we call to individuals, not to locations. With traditional land-line telephony, we called to specific places in the sometimes misbegotten hope that our intended interlocutor
would be somewhere near the phone we were calling. . . Such is not the case with mobile telephony. I call to the individual.”7 When someone makes a call to my cell phone, I could be located anywhere and could be in any embodied state. This free-floating attachment between body and space is possible due to the single-sense modality of mobile phone; everything you know about my situation is gained only by what you hear. The ability to implace each other over a phone call to a mobile device becomes an embodied practice, one we can manipulate due to the fluctuating attachment of a body to a particular place across the phone. We do, however, achieve a significant level of implace when we talk to one another on cell phones, so much so that emerging technologies have attempted to make such embodied connections even more explicit by removing the free-floating relationship between bodies and spaces.

In June 2010, for example, Apple introduced a new feature to its iPhone called “FaceTime.” This calling feature allowed people to connect with the built-in camera for video calling. As Steven Levy pointed out just over a month after the release of FaceTime, such a feature recalls AT&T’s previous attempt to institute video calling: “Among the wonders shown at the 1964 New York World’s Fair was the AT&T Picturephone, a system that allowed two people in video-telephone booths to make phone calls while peering at each other through TV screens.”8 Levy goes on to note that video calling was even conceptualized in early science publications in the 1870s. In 1927, as noted by Ken Ling-Pei Kung, Bell Labs experimented with video calling by connecting Herbert Hoover with then President of AT&T, Walter Gifford, in New York using a television signal in conjunction with the phone. Gifford “foresaw the use of television as an adjunct to telephone calls for face-to-face telecommunications in the future.”9 Commercial versions were available after the New York World’s Fair and, though there were numerous attempts in the subsequent decades to revive the technology, video calling never became an everyday practice. The reason that the Picturephone “bombed so spectacularly,” as Kenneth Lipartito wrote, has been the speculation of many scholars and designers.10

Lipartito asks an important question that gets to the heart of why we are so intrigued with the Picturephone and why it has surfaced in contemporary mobile phones through features like FaceTime. He writes, “To get at these issues, we have to start with a new question. We should ask not ‘Why did it fail?’ but rather, ‘Why was it invented?’”11 Since their inception, many communications media tend to prioritize a singular embodied sense at the sacrifice of others. Examples including the telephone and music recordings have historically been a single-sense medium, limiting our connection with another person to sound. One reason these “cool” media (to draw on Marshall McLuhan’s term for a medium that requires us to fill in the sensory blanks of a medium that offers limited information) become so successful is because they require us to practice embodied space. Here, our
embodied subjectivity, which is inherently intersubjective, is enacted. One reason that technologies like the Picturephone and FaceTime have been created is out of a misunderstanding of the relationship between bodies and spaces. Such technological approaches assume these categories exist a priori and thus the more sensory information we are given about our connection with someone, the more intimate our communication will be. Ultimately, these technologies attempt to reduce the practice of embodiment because, from this perspective, bodies aren’t practiced but only experienced. Instead, when we engage the process of enacting embodiment across media interfaces, we understand the inherent link between our practice of embodiment and the spaces bodies create.

A compelling example of this mode of embodied practice is Allucquère Roseanne Stone’s sociological study of phone sex workers. In her writings about her experience, she noticed that the entire project of phone sex was reliant on the fact that embodiment is something that is practiced rather than something that is a given. The important claim Stone makes in her observation, one that resounds strongly with my theories of embodiment, is: “[W]hat was being sent back and forth over the wires wasn’t just information, it was bodies.” She details this embodied practice:

The sex workers took an extremely complex, highly detailed set of behaviors, translated them into a single sense modality, then further boiled them down to a series of highly compressed tokens. They then squirted those tokens down a voice-grade phone line. At the other end of the line the recipient of all this effort added boiling water, so to speak, and reconstituted the tokens into a fully detailed set of images and interactions in multiple sensory modes.

Phone sex and its later instantiations such as “sexting” serve as strong examples of the ways we construct embodied space even when we are not near one another. Here, we again turn to the theories of Lefebvre, who argued for the production of space as simultaneously a production of embodiment. To put Lefebvre’s argument another way, embodiment is always a spatial practice and, conversely, space is always an embodied practice. To argue that embodiment is a spatial practice, I mean that bodies and spaces exist through their use, through movement, through person-to-person and person-to-object relationships.

These examples point to another defining component of embodiment in the age of mobile computing: once enacted, embodiment does not always need to be located in physical space. As people connect across networks on a global level, what many are experiencing as they practice the space of the network is embodiment. This has been one point of contention among users and non-users of information and communication technology (ICT): if you can’t reach out and touch someone, how can you truly have a meaningful relationship with that person? As I will more thoroughly develop in Chapter 3, as people develop significant relationships that
have their origins (or their entire existence) in and through digital media, what we are seeing is the evidence that embodiment is not dependent on physical space. Instead, we create space as we create our bodies across digital media. As Paul Dourish writes, “Certainly, embodiment retains this notion of immanent ‘presence,’ and of the fact that something occurs in the world; but it need not rest on a purely physical foundation.”

Here, I’d like to take a brief aside to make one important and relevant distinction that will be further developed in the next chapter. One of the implications of arguing for embodiment as that which is not reliant on physical space is that it exposes the dichotomy “real/virtual” as a false opposition. For, if it were an accurate opposition, then that which is virtual would also be considered “not real.” Quite the contrary is true. That which we encounter as virtual—from chatting with a loved one via text or over video conferencing to playing a multiplayer online game—is often so “real” that it alters the very ways we identify ourselves, the ways we use language, and the ways we conceive of everyday space. While I don’t find the “real/virtual” opposition useful or accurate, its use is actually developed out of a misconception of the virtual. In the next chapter, I will go into greater detail about the relationship between virtuality and the terms it is often coupled with or opposed to; however, it is worth noting here that our embodied relationship to the virtual must be linked to the phenomenologies of multiplicity. That is to say, an experience of the virtual is always an experience of the virtual in conjunction with another concept such as the “actual.” The term “virtual” comes from the Latin *virtus*, which is typically translated as “virtue” or being “effective in respect of inherent natural qualities or powers.” This was the common use of the word “virtual” in English until the late 1400s, when it began to stand in for ideas of force and power. The virtual as a force or power is always conjoined with ideas of actualization or realization. As John Rajchman writes, “The virtual lies in those forces or potentials whose origins and outcomes cannot be specified independently of the open and necessarily incomplete series of their actualizations. Such is their multiplicity (or complexity) that it can never be reduced to a set of discrete elements or to the different parts of a closed or organic whole.” Thus, the virtual is not the opposite of the real; instead it is a component of experiencing the real. The virtual serves as a way to understand the real and as a form of actualization that serves to layer and multiply an experience of that which is already realized. In terms of our embodied engagement with mobile media, which simultaneously takes place in our everyday spaces (which have been “realized”) and in the ways this space is augmented by virtuality infused from our interfaces, the terms cannot be used in isolation from one another. The realized or actualized is always implicated by the virtual (broadly defined) and such an implication is produced through embodied practices.

What takes place across the “virtual” space of mobile computing is almost always founded on social interaction in the material sphere (i.e., to learn how to practice embodiment in virtual space we must initially experience embodied
practice in material space). However, since the two realms are so intertwined, the embodied practice of space on mobile networks strongly reinforces our sense of embodiment in the material sphere. In other words, our sense of embodied self can be developed and thrive from interactions that take place across geographically distant places. When it comes to intimate interpersonal connections, face-to-face is now implicated and informed by the virtual.

Over the past decade, several studies have been done to test our abilities to perform actions simultaneously in our immediate material space and across the space of the mobile phone. Specifically, social and cognitive scientists have been interested in the effects of driving while talking on a mobile phone. While recent legislation across the United States and many other countries has banned the use of a phone while driving unless the driver is utilizing a hands-free headset, studies published as early as 1999 show that simply talking on the phone while driving can significantly increase the possibility of an accident. Most studies of the use of hands-free devices while driving find that there is amplification in the cognitive load from talking on the phone that causes an increase in distraction and even a degradation of hand-eye coordination with the road.\textsuperscript{17} Tying these results in with my analysis of embodiment in digital space, it becomes obvious that we are indeed all too ready to practice embodiment across media spaces, so much so that we are often more embodied in a virtual space (such as the space on the other side of the phone connection) than we are in material space. Thus, significant practices of embodied space can and do take place in spaces that have no foundational connection to any shared material space.

While it is essential that our experience of embodiment is a spatial practice, the ways we practice embodiment and space are very culturally specific. Ultimately, \textit{embodiment can never exist outside of culture}. Culture frames all of our embodied and spatial interactions. Elizabeth Grosz argues profoundly in her book, \textit{Volatile Bodies}, that bodies are always a product of the culture that produces them. She writes, “The body must be regarded as a site of social, political, cultural, and geographic inscriptions, production or constitution. The body is not opposed to culture, a resistant throwback to a natural past; it is itself a cultural, \textit{the} cultural product.”\textsuperscript{18} I find Paul Dourish’s definitions of embodiment to offer an interesting contrast to Grosz’s conceptions. “Embodiment,” as Dourish writes, “is the property of our engagement with the world that allows us to make it meaningful.” He goes on to augment his definition by stating, “Embodied interaction is the creation, manipulation, and sharing of meaning through engaged interaction with artifacts.”\textsuperscript{19} Such a proposition, while accurate, does not articulate the relationship between the production of embodied space and the production of culture. While Dourish’s second definition of embodiment seems to point toward a symbiotic relationship between culture and embodiment (much in the way that Lefebvre argued for a symbiotic relationship between space and embodiment), such a definition is not wholly developed, since bodies are never able to step outside of culture. While embodied actors do indeed create culture, they are inextricably created by culture.
The very essence of Heidegger’s “being-in-the-world” is produced out of the cultural nuances that serve as the spatio-temporal context of embodied being: from the words we use to describe what it means to inhabit a body to the associations we have with certain colors to the very ways we move our bodies through space, all of these foundational characteristics are entirely developed out of the culture that contextualizes us. To be clear, “culture” is not a transcendental signified, that single idea that is the end of the line of reasoning for the signifier of the body. Culture, instead, is multifaceted, never “grounded” in meaning, and made up of innumerable pieces that accumulate across time and space.

One question that will arise is: How do we describe culture if we are unable to get outside of it? Here, I turn to Jacques Derrida’s usage of the *mise-en-abîme*, which draws on the heraldry usage of the term as the representation of a shield depicting the very shield itself. Heraldry points to the design of certain shields, which had a coat of arms emblazoned on the whole of the shield. These shields would have a smaller copy of the shield and coat of arms design at the shield’s center. This was a type of representation of the item within the item. To draw on this metaphor and the ways Derrida uses it, we cannot escape culture (or, for Derrida, escape the text) but we are able to analyze it by describing the thing within the thing. Thus, while culture can and does exist in part outside of embodiment (since it serves as an organizing structure for embodiment), it is also constructed and maintained by embodied actors who are able to analyze it as a *mise-en-abîme*. Put another way, though embodiment is not pre-personal or some-thing that exists a priori to our engagement with it, culture is in fact something that is pre-personal and even structures our conceptions of the personal.

This is an important distinction to make with regards to our embodied, cultural relationships to the mobile interface. In contrast to this stance is the notion that technology is not culturally situated but is instead the force driving culture. Recent headlines in popular technology magazines echo such sentiments, ranging from “How the Tablet Will Change the World” and “Be Prepared for the Smartphone Takeover” to “Mobile Phones and Internet Essential in Building Democracies.” It seems in much of the advertising of emerging technologies culture is along for the ride as various digital media show us the possibilities. This cultural imaginary, termed “technological determinism,” offers not only a limited view of the role of technology in culture, but inaccurately frames a picture of humanity being pulled forward into a particular technological destiny. Instead of our embodied spaces being shaped by technology, there is interplay between the ways we shape our technologies and how they, in turn, shape us. Hayles explores this relationship in depth when she asks, “Should the body be subjected to the machine, or the machine to the body? The stakes are nothing less than whether the embodied human becomes the center for humanistic inquiry within which digital media can be understood, or whether media provide the context and ground for configuring and disciplining the body.”

Hayles’ position resonates with my understanding of the relationship between embodiment, technology, and culture when she writes
that a third perspective must be brought into the picture (beyond the centering of
either culture or technology), one that focuses on the “dynamics entwining body
and machine together.” Arguing that Friedrich Kittler’s dictum, “Media deter-
mine our situation,” offers an incomplete picture of the interrelationship between
culture and technology, Hayles points out that our situation is instead “encap-
sulated within the horizon codetermined by media conditions and cultural forma-
tions.” She continues: “If media alone are not enough to determine our situation,
neither is embodiment . . . Embodiment will not become obsolete because it is
essential to human being, but it can and does transform in relation to environ-
mental selective pressures, particularly through interactions with technology.”
Thus, our bodies, our spaces, and our technologies are all formed within culture
and subsequently work within the bounds of culture to transform it. Culture is
reworked from the inside by embodied interactors designing and repurposing
technology. Within this situation, technology often serves as a catalyst for the
massive cultural and embodied transformations that come to define an era.

In contrast to Kittler’s perspective, Mark Hansen has argued for a human-
centered understanding of the role technology plays in the transformations of
culture. He argues for a “bio-philosophical basis for the priority of the human
framing function over any possible technical frame, and thus shows that it has
already always been at work, buried as it were beneath the glitter associated with
the technical.” This bio-philosophical approach to embodiment in the mobile
computing age stems from the phenomenological work done by Merleau-Ponty.

One of the key theorists of phenomenology, Merleau-Ponty’s foundational ideas
about embodiment shows that embodiment is conceived out of the sensory. He writes,
“All knowledge takes its place within the horizons opened up by perception.”
Once embodiment enters the picture, we are already discussing theories of
perception. Any theory of embodiment, for Merleau-Ponty, is ultimately a theory
of the sensory. Our knowledge of the world and our place within the world
depends on the feedback from our senses. Though our senses can trick us at times
and be unreliable mediators to the world, even our knowledge of this type of
trickery is gained through the sensory connection between our bodies and the
world that surrounds us. As Merleau-Ponty argues, “For if it is true that I am
conscious of my body via the world . . . it is true for the same reason that my body
is the pivot of the world . . . I am conscious of the world through the medium of
my body.” He goes on to say:

Perception is not a science of the world, it is not even an act, a deliberate
taking up of a position; it is the background from which all acts stand out,
and is presupposed by them. The world is not an object such that I have in
my possession the law of its making; it is the natural setting of, and field for,
all my thoughts and all my explicit perceptions. Truth does not “inhabit the
inner man,” or more accurately, there is no inner man, man is in the world,
and only in the world does he know himself.
Merleau-Ponty’s sentiments here echo the foundational thoughts that served as the catalyst for the directions phenomenology would take. The early phenomenological work of Edmund Husserl broke from the mind/body dualism that characterized Descartes’ theory of being (“I think therefore I am”) and instead sought to argue for an understanding of being that put away the interior/exterior binary of the mind/body split. Instead, our thought processes are never divorced from our bodies. The very act of knowing we are beings in the world is an embodied act of perception. Heidegger extended this to argue for *Dasein*, or a theory of “being-in-the-world” that is “the more radical question of what gives or produces being as an effect,” as John van Buren notes.28

Our senses, which inform us of the world and our place as beings in the world, are inherently cultural (as previously stated) and are also interpersonal. While some senses might be heightened for some due to physical or cultural contexts (whether it be an increase in the faculty of hearing due a lack of sight or because the auditory is one of the dominant senses in the culture), these senses always find their full expression of existence in interaction. Our senses connect us as beings in the world through interaction with objects, such as a toddler’s knowledge of the limits of the body by experiencing where his or her shoulder ends and the edge of the table begins. For Jacques Lacan, in his famous work on the mirror stage, a child learns the limitations and borders of the body by seeing him or herself move and interact in the mirror. The arm moves and it is reflected in the object of the mirror. This sensory interaction teaches the child that the object floating around in front of the eyes is actually a part of the self—the hand. For Lacan, the mirror stage of development has a vital component: the child isn’t the only one in the mirror. Standing with the child is the child’s mother. Thus, an essential component of our senses teaching us about our place in the world is to know that my body is distinct from your body while simultaneously understanding that the sensations I feel must be mirrored in your body as well. Merleau-Ponty’s chapter “The Child’s Relations with Others” explains this phenomenon:

Only one recourse is left for classical psychology—that of supposing that, as a spectator of the gestures and utterances of the other’s body before me, I consider the totality of signs thus given, the totality of facial expressions this body presents to me, as the occasion for a kind of decoding. Behind the body whose gestures and characteristic utterances I witness, I project, so to speak, what I myself feel of my own body. No matter whether it is a question of an actual association of ideas or, instead, a judgment whereby I interpret the appearances, I transfer to the other the intimate experience I have of my own body.29

My experience of my body is reliant on the sensory interaction between the limits of my body, the space that contextualizes it, and the interaction with your body. As Casey argues, my “here” is entirely dependent on the fact that it is distinct
from your “here.” My embodied understanding that I inhabit this locale as my “here” has a continual reciprocity with the fact that I am aware of a “there” that others inhabit which will never be identical to my “here.” Though “here” and “there” are never the same, the ever-present relationship between the two spaces is what constitutes the intersubjective self as “being-in-the-world.”

This intersubjective formation of embodiment, especially across digital networks, is flourishing in the age of mobile computing. From the foundations of the mobile phone as a communications device to the current rise of location-based social networks, our mobile devices have been encoded with interpersonal connections as their founding principle. With the introduction of location-aware and site-specific social media, our interactions with online social networks that are now locative have transformed the relationship between embodied identity and social space. As will be discussed in more detail in Chapter 3, location-based social networks offer a form of intersubjective embodiment that gives participants a sense of social proprioception: a sense of embodied integrity that is aware of the self’s place as that which is always already situated in relationship to the location of others. I know where I am (and how I am) because I am always relating my space to the spaces you inhabit. The self’s identity extends beyond the immediate context and encompasses a much broader socio-spatial sphere.

While those things that we are aware of and perceive are vital to our sense of being-in-the-world, our senses also work at blocking out much of the sensory input that we are bombarded with. Thus, embodiment depends on the cognitive unconscious. Imagine for a moment that your senses did not place objects or people in the foreground and leave some in the background; or, imagine that while you were having a conversation with someone, that every other conversation in the room and every sound in the room became as equally important. This level of sensory overload would not only make communication and interpersonal relationships impossible; it would dislocate the self from the place. Our sense of being-in-the-world is quite dependent on much of the world not being noticed. We function as embodied beings because we do not notice everything or sense everything.

Building off of the long history of the relationship between consciousness and the unconscious, John F. Kihlstrom noted in his 1987 essay “The Cognitive Unconscious” that the metaphor of the “modern high-speed computer” served to inform our contemporary understanding of the complex relationship between cognitive awareness and the cognitive unconscious. As James S. Uleman describes, “In early models, the unconscious referred to preattentive perceptual processes and latent memory traces, so that complex higher mental processes depended on awareness for their operation . . . In later models, complex processing did not require awareness of the information that was transformed, so much more complex unconscious cognitive processing occurs.” The implications, as further developed by Kihlstrom’s research, are that our sense of self and knowledge of the world as gained through sensory perception do not take place entirely in the realm of
cognitive awareness. Instead, much of what we know of the world and our place within it takes place at the level of the unconscious (not to be confused here with the psychoanalytic use of the term). Kihlstrom expands on his research:

One thing is now clear: consciousness is not to be identified with any particular perceptual-cognitive functions such as discriminative response to stimulation, perception, memory, or the higher mental processes involved in judgment or problem solving. All of these functions can take place outside of phenomenal awareness. Rather, consciousness is an experiential quality that may accompany any of these functions. The fact of conscious awareness may have particular consequences for psychological function—it seems necessary for voluntary control, for example, as well as for communicating one’s mental states to others. But it is not necessary for complex psychological functioning.33

The makeup of the body is an important example. A question: Are you currently thinking about your toes? Or your ears? It is unlikely unless something about your toes or your ears is causing them to be noticed, such as an injury or extremely cold temperatures. Our body parts recede from perception so that we can exist as a whole body rather than a culmination of disparate sensory pieces. Such is the interplay between cognitive awareness and the cognitive unconscious. We notice the world and places within it through what we perceive, those things which are obvious to us through our senses. However, just as important are those things we do not notice—at the level of the cognitive unconscious.

The conception of ourselves as embodied beings is also seen in the relationship between cognitive awareness and cognitive unconscious use of technology. Heidegger writes about our uses of tools, or “equipment” which is “ready-to-hand” by becoming an extension of my hand. The tool at the moment of use is not characterized by the way it appears or how it feels; instead, a good tool (for many designers) is one that disappears when used. It is so intuitive that it is characterized by its purpose and use rather than its physical makeup. As he writes, “The peculiarity of what is proximally ready-to-hand is that, in its readiness-to-hand, it must, as it were, withdraw in order to be ready-to-hand quite authentically.”34 Using any digital interface will have users grasp the concept of ready-to-hand quite quickly, especially if the interface is one that is unusual for a user (getting my parents to use a newer videogame controller would be a good example). Conversations on a mobile phone also serve as a good example: once connected to someone, the interface of the phone typically recedes and you are moved into the space of conversation. If, however, there becomes an extended period of silence, the sense perceptions immediately pull focus from the other person to the device (the “equipment”). You will move the phone away from your ear to look at the screen, determining if you are still connected, if your reception is strong, or if your battery has died. This, for Heidegger, moves the
equipment from ready-to-hand to present-at-hand. It is the move from the cognitive unconscious to the realm of cognitive awareness. Thus, embodiment is a constant interplay between the two realms.

Though we may not perceive these elements of the world and our place in it, these elements that recede into the background are sometimes the most telling characteristics of a lived space. The behind-the-scenes, the off-stage, and the hidden-from-view often serve as the foundations for the perceptive world. And often when the cognitive unconscious elements move from the background to the foreground, there is a cultural paradigm shift that accompanies the new understanding of the sensory world. This movement is what can be considered (from our phenomenological point of view) the foundations of cultural revolution. In brief, which will be expanded more thoroughly in my discussion of the ethics of immersion in Chapter 4, a phenomenological reading of Louis Althusser and Antonio Gramsci’s notions of hegemony reveals that our embodied sensory engagement with the world (both at the level of the cognitive unconscious and at the level of cognitive awareness) has much to do with the ways that power is exerted. Althusser argues in his article “Ideology and Ideological State Apparatuses,”

The tenacious obviousnesses (ideological obviousnesses of an empiricist type) of the point of view of production alone, or even of that of mere productive practice (itself abstract in relation to the process of production) are so integrated into our everyday “consciousness” that it is extremely hard, not to say almost impossible, to raise oneself to the point of view of reproduction.35

Thus, as we shall see later in the book, the ethics at play between the sensory and the meta-sensory is a highly wrought battleground of control and subjection. Perhaps the “interfaceless interface” of pervasive computing carries with it the threat of exercising hegemony by receding to the background and avoiding critique.

While our sense of embodiment as formed through perception (via cognitive awareness and the cognitive unconscious) is culturally situated, it has been argued that much of what takes place at the perceptive level is not in the realm of the cultural but in the realm of the biological. Any theory of embodiment must therefore account for the fact that embodiment is conceived out of biological factors. Here, I return to Hayles’ quote from the beginning of the chapter, when she argues that our experiences of embodiment are not entirely cultural, but “emerge from the complex interactions between conscious mind and the physiological structures that are the result of millennia of biological evolution.”36 Thus, while the concept is far outside the purview of my expertise and the scope of this book, I do want to briefly note that many of the ways we encounter our bodies have to do with the biological makeup of our bodies. From hereditary traits to the ways our immune
systems fight disease, much of what serves as our embodied engagement with the world has to do with the impact that biological factors have on our bodies. While much of this can correspond with our sensory engagement with the body, such as having asthma or arthritis, much of what happens in our bodies happens at the cognitive unconscious realm. While my position on this predominantly sides with Merleau-Ponty when he argues that biological factors are secondary elaborations of our place in the world, the materiality of our bodies far exceeds the realm of the perceptible and nonetheless has important impacts on the ways we conceive of embodiment.

While embodiment is conceived out of an interrelationship between cognitive awareness and the cognitive unconscious, our embodied engagement with the world in a mobile media age is simultaneously conceived out of our relationship to the ways the world is inscribed. Thus, *embodiment is always conceived in relationship to modes of inscription*. Here, I seek to bridge a gap between phenomenology and poststructuralism, pointing toward a theory that understands being-in-the-world as simultaneously about our sense perception and about ways we encounter the world as a reading process. Here, poststructuralism intervenes, namely in Derrida’s understanding of our engagement with the world. He famously argues that “there is nothing outside of the text,” or, in other words, the world as we know it and engage it is simply ever-changing sign systems that we interpret. This process of interpretation is ongoing, never settled or “grounded,” and thus always defers meaning. He continues, “What we have tried to show by following the guiding line of the ‘dangerous supplement,’ is that in what one calls the real life of these existences ‘of flesh and bone’ . . . there has never been anything but writing; there have never been anything but supplements, substitutive significations which could only come forth in a chain of differential references.”

Thus, our embodied engagement with the world is a constant process of reading the world. Derrida, it must be noted, argued against any binary opposition between embodied presence and absence (filtered through representational forms), thus noting that what we consider to be “full embodiment” as face-to-face conversation and dialog is actually closer to a process of reading that is ongoing. Our embodied engagements with each other are always about meaning being deferred as we interpret words, gestures, clothing, race, gender, sexuality, and the cultural signifiers that are inscribed onto the body. Our sense perceptions here work in tandem with the ways that we read the world around us. And, for Derrida, this process of reading the various signs inscribed onto bodies is one that resists coming to full meaning and thus full, embodied presence is always being deferred.

Throughout this book, I will look at ways that embodiment is produced in relationship to the sensory and with modes of inscription. The latter will illuminate ways that we are read as embodied subjects with and through mobile technology. We simultaneously read the cultural inscriptions written on others (again, with and through mobile technologies). Bridging this notion with the necessary idea that our embodied integrity as subjects comes through a sensory engagement with
the world, I seek to show, through examples of mobile interfaces, the significant moments of complementarity and overlap between phenomenology and post-structuralism. When brought to bear on an analysis of embodiment in a mobile media age, these ideas offer a theory of the body that is far more nuanced and thorough than each of the theories individually. My theory of embodiment that is conceived out of this complementarity is called the “sensory-inscribed” body.

**Embodifying the Sensory-Inscribed**

My theory of embodiment blends the theories discussed above toward an understanding of bodies as simultaneously conceived through site-specific sensory engagement and a reading of bodies as always culturally inscribed. This theory of embodiment develops a particularly useful notion in phenomenology: proprioception. As a brief definition of proprioception, Mark Hansen writes that a proprioceptive experience of the body is that which “designates the body’s nonvisual, tactile experience of itself, a form directed toward the bodily projection of affection (affectivity).” Hansen develops this idea further when he quotes Brian Massumi: “Proprioception folds tactility into the body, enveloping the skin’s contact with the external world in a dimension of medium depth: between exodermis and viscera . . . Proprioception effects a double translation of the subject and the object into the body, at a medium depth where the body is only body.”

Proprioception is not reliant on the purely visual; instead, it combines all senses into embodied movement that clearly negotiates where the limits of the body are and how the body is located in the space it inhabits. Two examples of proprioception will elucidate this. Firstly, mentally locate the nearest mode of transportation, be it your car or a bus or train. Where is that mode of transportation in relationship to your current location (assuming you aren’t currently reading on the subway, that is)? How do you know its location if you are unable to actually see it? We are able to position ourselves in lived space and are able to know where we are in relationship to the people and objects around us (such as a car) through proprioception. We thus can locate ourselves in relational space at all times. If you walk to your car in a parking lot and suddenly realize that you have no idea where you parked, your proprioceptive relationship with your vehicle is lost. A second example develops the specifics about how proprioception functions. Merleau-Ponty famously discusses how the limits of our proprioceptive body do not necessarily end at the limits of the skin. Instead, we often extend ourselves out into the world in proprioceptive ways that extend our being-in-the-world well beyond the physical limits of the body. He writes:

> A woman may, without any calculation, keep a safe distance between the feather in her hat and the things which might break it off. She feels where the feather is just as we feel where our hand is. If I am in the habit of driving a car, I enter a narrow opening and see that I can “get through” without
comparing the width of the opening with that of the wings, just as I go through a doorway without checking the width of the doorway against that of my body.\textsuperscript{40}

Our perceptive understanding of our place in the world and how we specifically inhabit the spaces we move through is accomplished through proprioception. With proprioception, the senses work in conjunction—as they always have since no sense works in isolation from the other senses—to give us a sense of embodied place and situatedness. This sense of being “here” in the world extends well beyond the limits of the skin toward a relational being-in-the-world. In doing so, the spaces we inhabit fluctuate from our immediate surroundings to the distance between us and a destination or between us and another person. Again, this points to how our proprioceptive being-in-the-world can function across virtual spaces, including imagined spaces, such as being distant from a loved one yet connected to their space through an imagined proprioceptive engagement with their locale (as it is attached to my own).

This mode of proprioception is an incomplete version of embodiment since much of what we understand as being an embodied subject in the world relies on the ways we read or interpret the various sign systems around us. Our bodies, as culturally inscribed, are constantly read. Simultaneously, we are inscribing our bodies and the bodies of those around us. We “signify” identities through the cultural inscriptions of masculinity or femininity, the signifiers of our cultures, or sexualities, our religions, among other aspects of our embodied identity that we read in others and encode on our bodies for others to read. Oftentimes this encoding/decoding dynamic is thrust upon us through what Althusser terms “interpellation.” The interpellated identity is one that is inscribed by someone else, as that person or entity “hails” you as a particular body. An anecdote by Frantz Fanon of a white child “hailing” him as a black man, and subsequently as a dangerous black man is a profound example of this type of embodied inscription:

“Look! A Negro!” It was a passing sting. I attempted a smile.

“Look! A Negro!” Absolutely. I was beginning to enjoy myself.

“Look! A Negro!” The circle was gradually getting smaller. I was really enjoying myself.

“Maman, look, a Negro; I’m scared!” Scared! Scared! Now they were beginning to be scared of me. I wanted to kill myself laughing, but laughter had become out of the question.\textsuperscript{41}

Fanon goes on to say,

My body was returned to me spread-eagled, disjointed, redone, draped in mourning on this white winter’s day. The Negro is an animal, the Negro is
bad, the Negro is wicked, the Negro is ugly; look, a Negro; the Negro is trembling, the Negro is trembling because he’s cold, the small boy is trembling because he’s afraid of the Negro, the Negro is trembling with cold, the cold that chills the bones, the lovely boy is trembling because he thinks the Negro is trembling with rage, the little white boy runs to his mother’s arms: “Maman, the Negro is going to eat me.”

This entire process of reading the various inscriptions on the body is precisely the inscribed mode of embodiment that comes as a hermeneutic reading of bodies in cultural space.

A “sensory-inscribed” body, however, blends these two modes of embodiment. We are embodied through our perceptive being-in-the-world and simultaneously through our reading of the world and our place as an inscribed body in the world. This mode of phenomenological hermeneutics echoes Hayles’ materiality of embodiment in “an age of virtuality,” when she argues for a dynamic interaction between “the body as a cultural construct” and our various experiences of embodiment that are understood as “a dance between inscribing and incorporating practices.” Thus being simultaneously a perceptive, experiential mode of being-in-the-world and a process of “inscription and incorporation,” the sensory-inscribed body serves as a bridge between the body as sensory and body as sign system. Neither precedes or dominates the other; instead, they work in conjunction to produce the embodied space of pervasive computing culture.

An example of the sensory-inscribed body in mobile phone culture will illuminate the interplay between the sensory mode of embodiment and the sign-system mode of embodiment as they simultaneously function to embody us in the world. A colleague of mine at the university had a very strict policy of “no cell phones in the classroom.” However, during one of her lectures, a student’s phone rang. She paused while the student fished for his phone in his bag, waiting for him to turn it off. Instead, the student looked at the screen to see who was calling and then answered the phone. Without getting up, he began speaking to the person on the other end of the line, who (it soon became obvious) was a relative facing a moment of crisis. In this scene, the sensory-inscribed body is at play on several levels. Firstly, the student’s sensory mode of embodiment is located in two places at once. He was in the classroom and also in the place where his relative was in a moment of crisis. His being-in-the-world was simultaneously here and there as he connected with those students and professor in his immediate surroundings and with the loved one over the phone. His embodied space is both material and virtual. He apparently sensed the urgency in the voice of the loved one, able to perceive the gravity of the situation. Thus, simply through aural means, he could place himself in the “here” of his loved one, embodying their crisis. While his sense engagement with the world situated him across places—the classroom and the location of his loved one—he likely filled in the sensory gaps in the perceptive moment. Relying solely on a single-sense technology, a person in his situation
makes assumptions about what may be going on at a loved one’s location, their gestures and other non-verbal expressions that are imperceptible. Beyond this mode of embodied engagement, this student was soon keenly aware of the ways the encounter was being read. Receiving disapproving (and utterly shocked) looks from the professor and the other students in the classroom, the student soon realized the major cultural faux pas he was committing by using a mobile phone in this setting. As he got up to continue the conversation outside, and in order to counter the negative inscriptions of his actions as he read them, he embodied expressions of urgency, demonstrating the unique nature of the call to those in the classroom. As he opened the door to the classroom in order to leave, he offered advice to his relative and, with the door open, he paused and looked at the screen. The line had gone silent. “Hello?” he repeated, but the call was over. Did he offer poor advice? Had the reception vanished? The silence itself entered into the sign system of the moment. He turned around, looking apologetically at the room, and returned to his seat.

Negotiating these various modes of embodiment is to understand the sensory-inscribed. Neither the sense perceptions of the moment nor the reading of the various signs of the moment would offer a full picture of what it means to be embodied in the situation. Thus, by seeking a theory of the body that bridges the phenomenological modes of body and the cultural inscriptions of the body, we see a fuller view of what it means to function as a being-in-the-world. The sensory-inscribed body envelops all of our experiences of the body.

Beyond the simple example of using a mobile phone in a classroom, this conception of embodiment is essential to the ways we interact with and interpret emerging cultural forms. From art to narrative to the games we play, the sensory-inscribed body offers a fruitful lens with which to view the emerging landscape of the mobile interface. While it has been my goal in this chapter to fully develop a working definition of embodiment for the era of mobile media, this notion is incomplete without coupling it with an investigation into the spatial characteristics of pervasive computing culture. In the next chapter, I will seek to connect my definition of embodiment with an exploration of mobile media spaces.