2 Embodied Predispositions

Place begins with embodiment. Body is place, and it shapes your perceptions. Embodiment is not just a state of being but an emergent quality of interactions.[1]

The discipline of interaction design has been built from foundations in our understanding of cognition. Increasingly, this work recognizes the importance of "cognitive background"; the cumulative perceptions of enduring structures that fundamentally shape human abilities.

The discipline of architecture also reflects some deep knowledge of environmental perception. This, more than fashionable geometry, is what that older field may best contribute to the newer one. For interaction designers seeking to know more about context, space, and place, and conversely for architects wishing to understand the roots of interactivity, the principles of embodied predispositions provide increasingly common ground. For anyone wishing to understand the role of context, a detailed look at these foundations is worthwhile. Principles generally acknowledged by environmental psychologists, applied by architects (and occasionally dramatized by body artists), now become relevant to the design of information technology. Any review of these theoretical principles is necessarily dense and may appear too academic at times, but it provides a useful foundation for new technological developments in contextual awareness. It also provides one basis for the current shift from virtual world building to pervasive computing.

The exploration of embodied interactions reveals to us conditions otherwise often taken for granted, yet to study them is not to state the obvious. Many of these conditions are familiar to each of us, but difficult to predict or measure. Nevertheless we cannot dismiss them for lack of metrical proof. They may be essential to experience, yet we need not conflate them with questions of pure philosophy.

To be practical, this inquiry must emphasize everyday situations. For example, consider the corner office. Obviously, occupying this location is an expression of power, which comes with practical rewards of more light, views, and air than other offices have. It also functions as a site of exchange, for although information can be transmitted in the abstract, the exercise of status still demands a chance for

the players to size each other up. Hence the better corner office provides a variety of locations in which two or three people can sit in relation to each other. Body language matters here. Someone might get hot under the collar. This demonstrates that even in us well-dressed mammals, visceral factors such as gesture, temperature, and smell still influence the establishment of rank.[2] This alone guarantees that although telecommunications have taken over information exchange, they may never replace face-to-face meetings for exchanging power and opportunity. Although the protocols used for human meetings are more subtle than circling and sniffing, this exercise of power still depends on physical factors. As evidence for how sensitive humans are about the spaces they use for negotiation, consider how diplomats haggle over the shape of council tables, or salesmen carefully size their closing rooms. Appropriately configured physical space tacitly allows subtle variations in interpersonal distance.

From one person's body language to a whole society's body politic, much else besides the exchange of power depends on embodiment in contexts. Lighthearted conviviality works best at close quarters over food. A personal dwelling involves an accumulation of tangible souvenirs. Societal memory uses physical landmarks, and this is what makes the city the repository of civilization. Social recreation uses public sites for the presentation of self, for which physical architecture sets the stage. A rich and deeply structured background of environmental patterns exists not only in the individual but also in the culture and the species. The exercise of these is the making of the world.

Body Image, Body Art

The body is your first and last site, your center, and your scale. As stated best by the cultural geographer Yi-Fu Tuan, "the body imposes a schema on space."[3] Up is most decidedly different from down; front is different from back; the world unfolds before us and recedes behind us.[4] We move forward. To confront a problem is the opposite of turning your back on it. Left is even different from right, despite that being our one essential axis of bodily symmetry. People turn right more eas-

ily, at least in America, and shopping malls sell more goods off the walls that are on customers' right side as they enter the stores.

Besides giving orientation, this bodily schema establishes range. The distribution of guests at a cocktail party demonstrates distance. Range can be aural—close enough to listen or far enough to be out of earshot—or a much more complex matter of social protocols based on personal familiarity. Bodily range also incites action. Something within reach of your strides suggests that you might move closer. Things in reach of your grasp take on greater significance and are perceived more vividly and actively than things far away. Things within your grasp invite use.[5]

Along with range, the body gives scale. Whether something is relatively larger or smaller than you are affects how you react to it. The same picture reads differently at poster and at postage-stamp sizes.[6] Objects and spaces near our own scale are more comforting than abstract ideas and measurements at radically different scales.

Much of our bodily stress comes from encounters with the vast or the tiny. The body gives scale, shape, and orientation to our picture of ourselves in the world. Astrophysics and microbiology distress some of us because they demonstrate that human scale is not the measure of all things. In contrast to all that is neutral, infinitely extensible, isotropic, and empty about rational "objective" space, embodiment is highly subjective. Extremes of scale conflict with the image that the body is a center.

Body image is actively constructed.[7] Social games play at presentation of this self in different environments. Sports and dances cultivate the abilities of centering. In the practice of Tai Chi, for instance, one works to move the center of one's body image (which has often crept upward toward the head) back down into alignment with one's kinesthetic center. Such interrelation of sensation, motion, posture, and expression occurs unconsciously throughout life's processes, and from these relations each of us builds a keen sense of haptic orientation. (The word *haptic* describes the active, probing aspect of the sense of touch.) Haptic orientation often precedes the formation of visual mental models, and is important to the study of predispositions.[8] Such precedence is at work when you jump out of your seat at a movie, for example.

The recent surge in body art tells us that embodiment has been in play in both street and gallery culture.[9] Visceral art reclaims space from all that has been abstract and nonmaterial in modernity. Amid a consumer culture that emphasizes the body as the bearer of cultural symbolism, and therefore an unfinished entity, body art appeals to an enormously broader audience than other sorts of provocation-art.[10] Meanwhile, the academy propagates theories of the embodied subject.[11] Whether this trend constitutes indulgent degeneracy, psychological profundity, or simple nostalgia becomes the crux of aesthetic debate.[12] The critic Robert Hughes once satirized this movement: "You don't like my warm guts? Yeah, you and Jesse Helms, fella!"[13] But as in computing, so in art; some paradigm shift has occurred. As insider-art spokesman Hal Foster declared, "This shift in conception—from reality as an effect of representation to the real as a thing of trauma—may be definitive in contemporary art."[14]

In the study of human consciousness, will the already much-mourned "loss of the subject" be consummated by the blurring of distinctions between the body, technology, and symbolic reasoning? Those are questions for our best philosophers.

Embodied Being

"I refute it thus!"
—Samuel Johnson to Boswell, kicking a large stone in response to their discussion of Bishop Berkeley's proposal of the nonexistence of the material world.[15]

Our inquiry into embodiment must acknowledge some basic philosophical principles. Without delving into this very far right now, note that the mind-body problem has been at the heart of philosophical inquiry for a very long time. For instance, in the Bible, Romans 8:5 says "For they that are after the flesh do mind the things of the flesh; but they that are after the Spirit do mind the things of the Spirit." It is also central to western enlightenment philosophy of the seventeenth and eighteenth centuries. From the discourses on disembodiment that so offended Boswell and Johnson, into twenty-first century theories of

cyberspace, a dualism of mind and body has dominated western thought. For some direct evidence of how deeply contemporary thinkers still live with a mind-body split, just watch them act it out by reading the *Wall Street Journal* while they work out on the Stairmaster at the gym.

Descartes had famously asserted that an independent spirit, which inhabited the body, was the impetus behind mental states. The body merely belonged to a world where organic forms operated under the same laws as the rest of nature; that is, mechanistically and without higher goals.[16] This dualism placed disengaged thought ahead of embodied action.

It also led to strong notions of *a priori* space. Preexisting space was the means by which relations among objects could be realized. One consequence of this world view has been a corresponding dualism of culture and nature. In this understanding, a culture imposes symbolically constructed categories on neutral, preexisting nature. An eighteenth-century formal garden expresses this view, for instance. So does a twentieth-century mentalist theory of cognition. An information-processing model of mind assumes a detached subject who is constructing—and then imposing—mental representations. These constructs interpret stimuli from a physical world, but that world is neutral.

Internet users reenact this concept. In believing that they "visit" sites when in fact their browser software downloads packets of data to wherever they are sitting, people suspend disbelief about disembodiment. This aim is credible enough. From ancient Vedic and Platonic philosophies to medieval aesthetics to modernist utopianism, more contemplative souls have always aspired to rise above the mud, disease, and battle that have been humanity's physical lot. People have always quieted themselves, and in some sense left where they are, to contemplate, deliberate, and imagine.[17]

There would be no need to raise all these points if recent brain science had not challenged them. A growing consensus among the biological-naturalist camp of cognitive scientists contends that mental activity is just as much a biological process as, say, digestion. This view has the significant ramification that a great deal of thought is

preconscious—and none of it is dematerialized. Mental attributes and constructs are emergent, much as water is wet.[18] Thus the structure of embodiment, itself a product of adaptation to environment, may underlie emergent intent.

In summary of this new understanding, George Lakoff and Mark Johnson boldly declared: "The mind is inherently embodied. Thought is mostly unconscious. Abstract concepts are largely metaphorical. These are the three major findings of cognitive science. More than two millennia of *a priori* philosophical speculation about these aspects of reason are over."[19]

Already well known in interface design circles for their past work in metaphor, Lakoff and Johnson have now presented a more complete theory of cognitive background. Bodies shape conceptual structure; environmental experience grounds metaphor; and a lot more thought is metaphorical than has been assumed previously.[20] Among other results, this leads to an understanding that "The environment is not an 'other' to us."[21] This argument is part of a larger shift that places humanity back within the natural order.

This most recent chapter in the history of embodiment justifies our excursion into pure philosophy before turning to the technological topics at hand.

Mental Models

While acknowledging larger philosophical questions, the discipline of interaction design tends to focus on the mechanisms of perception. For a long time, a cognitive dualism has underlain behavioral approaches to the design of technology. Now some residual connotations of analytical behaviorism must be overturned.

To begin, there exists a claim that only humans have a conception of the world as it is from no particular standpoint.[22] Wittgenstein said that a cat can find its way around the neighborhood—but that it cannot see itself finding its way around the neighborhood. To do the latter would require a reflective "survey perspective" that appears to be distinctly human. For an example of such a perspective, to count the number of windows in your house, you do not have to be in your

house. To recognize your house in an aerial photo, you do not need to have seen it from that orientation before.

"A disengaged picture of a persistent world" is the basis of a spatial mental model, which is a principal issue in philosophy and cognitive science.[23] Apparently humans assimilate their surroundings by means of mentally constructed representations of spatial relationships. Formerly, researchers held that such environmental schemas are purely mental, but now there is greater recognition of direct engagement and peripheral awareness as complements to deliberative mental models.[24]

In comparison with overt behavior, peripheral awareness tends to be more difficult to study in controlled experiments. Tacit knowledge loses something in the translation to conventional external representations. Understandings based in activity cannot always be articulated without stopping that activity.[25] Where modern researchers confined themselves to behavioralism in the name of scientific certainty, a limited version of environmental psychology emerged.[26] Thus spatial behavior has a well-developed body of scholarly findings, yet our knowledge about shifts in intentional frames of reference is less certain.[27]

For example, many of the most prominent studies of spatial mental mapping have examined the readily documentable process of wayfinding. The Siegel and White studies of 1975 established the distinction of route and survey perspectives, as well as the use of information processing in wayfinding.[28] Much subsequent study has reinforced the view that navigation consists of making decisions at landmarks, even if the resulting "picture" is less of a map than a recombined collage.[29] This, too, predisposes researchers toward the topic of wayfinding, for it turns it into a problem in information processing.

Architects and planners explored cognitive mapping a generation ago. The pioneering work of the urbanist Kevin Lynch is known to many technology designers forty years later.[30] Following Lynch, academic enthusiasm over mental maps of built environments perhaps reached a peak in the early 1970s. Then as psychologists found limits to geometric coherence, and architects found some of their essential understandings unquantifiable, research interests moved on.[31]

Toward Phenomenology

In their reductionism, the first generation of findings on environment and behavior have left out two particularly vital concerns. The first of these is *intent*. Intentionality counters behavioralism with a concern for attitudinal or perceptive states that need not result in overt actions, or that at least precede actions. For example, the act of walking down a street may be shaped by what one is looking for, whether one is in a hurry, or whether one feels well dressed.

The second omission is *context*. Contexts do not induce actions so much as shape perceptual selectivity, provide background cues, and enable the application of tacit knowledge. Active embodiment cues what would otherwise be isolated sensory awareness. Intent in context causes cognition to be about something. Here begins an interest in predispositions.

This shift begins with the principles of phenomenology.[32] "Theory of the body is already a theory of perception," wrote the philosopher Maurice Merleau-Ponty. "Our own body is in the world as the heart is in the organism: it keeps the visible spectacle constantly alive, it breathes life into it, and it sustains it inwardly, and with it forms a system."[33] Atop a continually changing substrate of embodied perception, the abstract mental model arises only occasionally, and only when necessary.

The body is our general medium for having a world. Sometimes it is restricted to the actions necessary for the conservation of life, and accordingly it posits around us a biological world; at other times, elaborating upon these primary actions and moving from their literal to a figurative meaning, it manifests through them a core of new significance: this is true of motor habits such as dancing. Sometimes, finally, the meaning aimed at cannot be achieved by the body's natural means; it must then build itself an instrument, and it projects thereby around itself a cultural world.[34]

Such phenomenology challenges the presumed neutrality of mind-body dualism, on the grounds that the objects have universal

essences.[35] The embedded essence affords intuition to subjective intent. In other words, repeated encounters with objects in contexts let us become aware of those objects before any conscious deliberation about them and, furthermore, affects what is likely to rise to consciousness. Dogs are especially inclined to see other dogs, for example. This appears to be a fundamentally structuralist approach; the object's reality becomes understood structurally through the accumulated experience of its many possible instances. It is also constructive; a phenomenon is the moment when the intuition grasps an essence.[36]

Of particular interest to interaction designers today, phenomenology has provided a more practical approach to cognition.[37] Heidegger held that we understand the world in terms of what we can do with what we find of it. Merleau Ponty described how innate structures precede modeling and making. The psychologist J. J. Gibson extended these understandings to a focus on interaction. In his landmark work, Gibson laid a foundation for understanding human-environment interfaces.[38] His concept of "affordance," now so often abused, interpreted the world as an offering of perceptible structures of possible actions, which are grasped through engaged and not necessarily deliberative action. This is chiefly a claim for direct perception. Here seeing and knowing are one. "Seeing as" combines vision, embodiment, and environment. Haptic orientation shapes this seeing. This continual, preconscious condition underlies, and does not always require development into, discrete mental constructs. This means that learning is a lifelong process that takes place largely in the background.
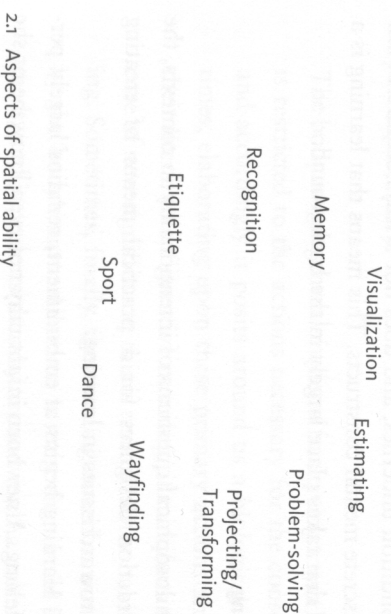
Embodied Learning

Under larger philosophical questions of intentionality in contexts, the search by interaction designers for a practical means of creating usability tends toward issues in learning.

Contextual learning begins at embodiment, remains largely personal, and is lifelong. A newborn infant may not even know he or she has a body—only needs—and therefore may not be able to distinguish between self and environment.[39] From this limited and very egocentric frame of reference grows an increasingly articulated understanding of

an outside world. Because contexts are learned through actions and events, much of this understanding is based on memories of interactions: object permanence, landmarks, proportional configurations, spatial categories, procedural contexts, swapped frames of reference, geometric measures, building elements, generative typologies, systemic behaviors, formal elegance, regional characteristics, ecological sustainability.

Understanding proceeds with a constant cycle of construct readjustment.[40] Environments that subtly challenge our constructs provide more satisfaction than those in which everything conforms to expectations. In learning one does not simply form a picture of a static world, but instead actively shapes that world according to emergent understandings. It is important to note that embodied learning occurs at several levels, ranging from the preconscious construction of mental models, to the personal construction of affordances, to the cultural mediation of spatial literacy (figure 2.1).[41] Etiquette is an example of the latter. For instance, a new arrival on a university campus goes through a period of willingness to enter any building socially, and then a period of settling into a routine of places, before developing a subtler use of the campus.

Visualization

Estimating

Problem-solving

Projecting/Transforming

Memory

Recognition

Etiquette

Sport

Dance

Wayfinding

2.1 Aspects of spatial ability

Throughout these levels of learning, engaged interaction is at least as important as detached perception. The possibilities of the world correspond to the capacities of the body. Those capacities may be innate or acquired, direct or mediated, universal or constructed by a particular culture.

This points toward the roots of interactivity. Contexts are full of props and cues, which serve as learning resources and memory devices for evolving patterns of usage. Many such cues serve as constraints; context rules some things out so that others may receive closer attention. Those perceived resources are appropriated toward an active intent.[42] This grasp is engaged but not necessarily reflective. It is as much a product of the abilities and intents of the subject as of the properties of the object. This is one reason why the use of tools transforms the perception of environment. This actively engaged way of learning about the world challenges the assumption that technology is a purely symbolic literacy, independent of ground.

Spatial Literacy

Studying interactivity reveals the cultural aspects of embodiment as well. More of us note how cultures and their symbolic systems mediate learning processes. In this regard, it becomes possible to speak of spatial literacy.

For example, one learns to read a city without the aid of books and maps, and to do so partly on the basis of experience with culturally similar cities; some individuals and some cultures develop more ability than others at this.

As with most cultural differences, spatial dispositions show up in language. For example, while an Englishman might live "in" a street because a street was once a public living room, an American lives "on" a street because it is merely an address, and to judge by current naming practices, would prefer to live on a road, a lane, a court—anything but a street.

Language itself plays an important role in spatial literacy. Language abounds with bodily metaphors that recall the experience of environment. To return to the case of the corner office, note that the

word *corporate* derives from *corpus*—the body. Within business banter, consider the prevalence of an upward schema, which is the direction the body grows. Thus, for example, in a corporate setting you might hold high ambitions, dress up, rise to the occasion, stand up to authority, or do some heavy lifting.

Spatial language builds from words to metaphors, narratives, and even world views. Mythological narratives color local landscapes.[43] Allegory often employs spatial progress (e.g., a pilgrimage to the inner circle). Epics construct detailed and coherent worlds. Thus a culture uses spatial configuration as a memory device. For example, the New England village persists as a representation of a particular spirit. Its neighboring villages provide a cultural memory of life before steam plants and railroads. Its building forms also provide civic legibility—you can tell where to go to find public life.[44]

Spatial literacy should not be confused with literal signage declaring space. They are quite opposite. Whereas an outsider who lacks local spatial literacy needs the latter for guidance, a literate denizen reads a space from its events and its symbols, like animal scat on the trail, and does not enjoy being told where to turn, what exactly occurs in each place along the road, or that a brand-name experience will protect him from unwelcome surprises.

Social Configuration

Social territories involve a literacy also. The cultural geography of belonging and identification depends on learned spatial cues that are not necessarily hard-built in an explicit form. Moreover, as Foucault insisted, the existing outward forms afford readings of social relations that their owners would sometimes prefer to remain tacit. And this literacy is bodily; power and discipline become readable in their conventions for organizing bodies.[45]

Set up a group of animals in a fenced-in area and soon individuals will have staked out their territory and their pecking orders, all of which will be clearly expressed in a settlement pattern. Patterns of spatial usage tell us as much about a species as the anatomy of its individuals.[46]

Humans are no exception in this regard. Put a group of people in a room, and they will quickly organize themselves. Consider the importance of social distance, presentation of self, and territoriality. On a larger scale, note collective memory and the anthropomorphizing image of the city.

Interpersonal distance is the great mediator of social standing. On almost any scale, the inflection of interpersonal distance provides a tacit set of social cues. This is important to natural interactions; the tacit geography of these social relations constructs place.

Social distance thus establishes categories of experience, from the intimate to the collegial to the public.[47] Framing the interplay of embodied behaviors remains the most important function of environment. Building instrumentalizes and civilizes social "distance." Architecture consists of built social relations. Its behavioral framing establishes who may see whom and under what protocols. Systems of social distance become more elaborate in wealthier and more sedentary cultures, that is, those with an investment in fixed places.

Body image reinforces these systems with distinct codes of behavior and dress. These etiquettes do not stifle social expression so much as specialize it. They do not fix distance rigidly so much as establish the variables for fair play of the game.

In a favorite example among environmental psychologists, a sense of crowdedness depends on what people are doing.[48] Concertgoers have a different notion of personal space than ballroom dancers. Labor-intensive rice farmers pack together more comfortably than capital-intensive, industrialized wheat growers. Subsistence hunters may feel crowded in the wilderness when food gets scarce. In the city, variations on crowding make life enjoyable. Nightclub mosh pit enthusiasts go for the contact that they lack while sitting at computers all day.

Note that habitual embodiment in a persistent environment of quality lets adults play too—at daily games of social standing. As an example of sophisticated play, consider the case of the evening *paseo*, the traditional Spanish custom of strolling back and forth along the town square. This arrangement gives each citizen a chance to present himself or herself to the community. Compared with the *paseo's* standards of social skill, many modern Americans do not walk very well.

Besides these finer exercises of social distance, territoriality establishes elaborate patterns of enclosure and access. Crude territorial marking underlies elaborate form, and built space is as much a display of ownership as a framework for social conduct.[49] Great value is conferred on the site of dwelling. By establishing a center outside the body, to house, rest, and reflect the body, the form of dwelling reflects the condition of embodiment more directly than just about any other social construction. Dwelling is grounding, in the oft-cited Heideggerian sense.[50] To dwell is an intentional state, and a historical one, in which one identifies with a place.[51]

Note also that just as enclosure indicates ownership and regulation, so open space equates with freedom. Open space is room to move and grow. Space that is open, yet owned (with enclosures that are intangible or removed from sight) is the best of both worlds. In America, especially, such space expresses prestige.

Cultural Disposition

Entire cultures dwell, and they build stories and literacies around that fact. As evidenced by cultural differences in land use, for example, cultural bias develops at the level of the built environment. In traditional societies, tales beginning from the center present the universe as an orderly and harmonious system, which settlement patterns attempt to reenact. Perhaps the first stories described the best routes to hunting grounds. Then came metaphor: to grow *up*, to form an *outlook*, or to dig *in*, was to remember space. Indeed most narrative imagery and allegory was somehow grounded in common spatial experience.[52] From this chthonic basis, each culture could built its own orientation. Landscape features acquired personalities, geographical excursions reenacted histories, social correspondences were applied to the cardinal directions.

The anthropologist Mircea Eliade once described such spatial attributions according to the principle of homology.[53] In his description, homology is a formal similarity between a sacred condition and a profane reality. It gives meaning to the human condition by repeating the structure of spiritual belief systems in the configuration of the

physical world. It grounds. Such spatial relations deepen a sense of connectedness, orientation, and duty to the land. Some contemporary cultures perpetuate this quality more than others. For example, the Balinese maintain a mythology built from the fact that on their island a striking number of rivers flow in parallel from volcanoes in the north to the sea in the south. In the resulting moral geography, north/uphill/sacred is where one can pass from one cosmic condition to another, and south/downstream/profane is to be avoided.[54] Hence the latter area has been more readily conceded to westerners, who enjoy the surf.

Quite often a people forgets that it has a particular environmental orientation, however. A culture may not always acknowledge that even the most mundane environmental configurations are far from inevitable: choices have been made. Recollecting this is what makes travel so interesting. More than beaches, what attracts western tourists to Bali is how everyday space manifests divinity. But the use of everyday space is also full of choices. A tourist seeing some other culture using, say, fences so graciously to facilitate close living may suddenly realize the arbitrariness of that peculiar American preference for the open, nominally democratizing, expanse of lawn.

As each culture develops its own environmental ordering as a foil to the world's indifference, settlement patterns not only reflect but then also shape beliefs (figure 2.2). As cultures become identified with their

Cognitive
background

Cultural
idioms

Engaged
activities

Psychological
constructs
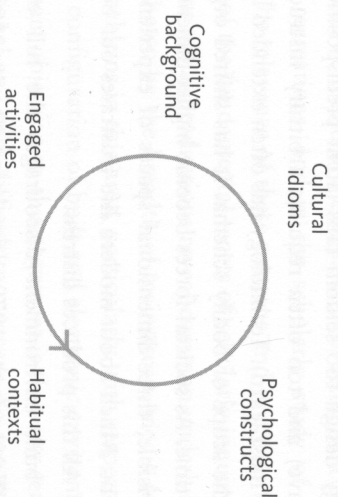
Habitual
contexts

2.2 A general notion of construct adjustment in habitual contexts

peculiar spatial customs, landscape tends to serve as the best framework for narrative memory. Thus Cicero could write: "*Quacunque enim ingredimur, in aliqua historia uestigium ponomius*;[55] "For walk where we will, we tread upon some story."

Deskilling

Unfortunately these patterns can grow too rigid. When particular arrangements have proven convenient, or have been socially or cosmologically conditioned, or have too often been validated in individual experience, they become less flexible. This inflexibility reinforces cognitive preferences. Those events that reinforce the schema appeal more than those that challenge it. Preference becomes predisposition; constructs become imposed on environments, and challenges to them get ignored, at both the personal and the social level.

Thus the cycle of embodied environmental literacy can turn downward. Technological convenience allows many helpful new constructs to form, but it also allows events that would normally serve environmental learning to dwindle. Quite often such troubles are blamed on cultural considerations such as economic models, but personal considerations such as body image also contribute. In this view, if only more people could make the connection between bodily schemas, domestic patterns, city form, and regional identity, the world would be in better shape.[56]

Technology design too seldom taps latent predispositions (skills we already have) and too often requires arbitrary instruction (still more skills we must learn). Technology has often extended life experience beyond the scope of bodily schema. It has shifted organization from space to time. As societal forces become higher dimensional and less directly visible, three-dimensional spaces of experience seldom remain coherent. Much about modern life frustrates our body image imagination.[57] All this produces distress.

Even the built environment discourages the full exercise of embodiment. Writing in the 1970s, long before the age of virtual reality, the architects Kent Bloomer and Charles Moore cautioned against deskilling in a culture based on visual novelty: "One of the most haz-

ardous consequences of suppressing bodily experiences and themes in adult life may be a diminished ability to remember who and what we are. . . ."[58] According to the ecologist Wendell Berry: "We have given up the understanding—dropped it out of our language and so out of our thought—that we and our country create one another"[59]

On a subdivided farm in central Massachusetts, a developer puts up Yankee saltbox houses. This traditional two-story building type is named for the way its roof comes down to the first story on one side to fend off the winter wind. But the developer sites these saltboxes arbitrarily, and many of the roofs end up facing the sun, not the wind. "Man dwells badly," wrote Le Corbusier, "and that is the deep and dear reason for the upheavals of our time."[60]

The Case for Ground

Although some larger critique of settlement patterns and the spatial deskilling they reflect seems inevitable, our present concern is much simpler. If spatial deskilling has emerged as a major problem of our time, then our technological constructs must be adjusted to confront this. The relevance of these patterns and practices is demonstrated by one of the fundamental tenets of scholarly inquiry, namely that independent social productions reveal common underlying structures. It is also shown by the breadth of mainstream media focus currently given to problems in this area, particularly with respect to the socially limiting configuration of built and electronic environments.

The main objection to this argument is that any sense of place is highly personal and very difficult to measure. So too are hope, faith, and happiness, of course. Design, technology, and academic inquiry cannot afford to continue to ignore human emotional and intentional

states (rather than merely human behavior) simply for the sake of certainty. Compared with some rather more difficult social conditions, attention to embodiment provides a fairly straightforward opportunity to develop the expression and valuation of properties that for too long have been dismissed as unmeasurable.

Another major objection concerns that fact that environmental sensibility cannot always be advantageous. We cannot always stop and smell the roses. Overattention to the periphery may distract from urgent decisions to be made in the foreground. When crossing a street, you do not have time to study the surrounding scenery; you must get to the other side.

In the end, people prefer to operate on a full spectrum of focus, from deliberation to contextual association to the unconscious application of cognitive background. Qualifying the value of environmental knowledge according to this spectrum is not so much an objection as a way toward the better design and practice of appropriate technology. Embodiment is a property of interactions; latent embodied abilities exist; and good interactive technology lets us exercise these abilities.