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# Environmental Health

## From Global to Local

SECOND EDITION

HOWARD FRUMKIN

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## CHAPTER FIVE

# ENVIRONMENTAL PSYCHOLOGY

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### KEY CONCEPTS

- Environmental psychology expands the scope of environmental health by considering health and behavior in their sociophysical context.
- Environmental psychology emphasizes both environmental hazards and environmental conditions that can promote good health.
- Environmental psychology considers both objectively measurable environmental conditions and subjective perceptions of the environment.
- Environmental psychology considers both immediate and remote environmental conditions, the cumulative effect and interaction of different environments over time, and the interaction of objective and subjective factors.

**E**NVIRONMENTAL psychology focuses on behavior in its sociophysical context. The field of environmental psychology assumes that a dynamic and reciprocal relationship exists between individuals and groups and the environments in which they live, work, play, learn, recreate, and travel (as displayed in the Perspective “A Trio of Tripping Pedestrians”). To an environmental psychologist, environmental health and well-being are the result of an appropriate and supportive fit between an individual or group and the places and people with whom they interact as they go about their lives.

## PERSPECTIVE

### A Trio of Tripping Pedestrians

Pat tripped first. She had stepped off this curb hundreds of times, and if you'd asked her, she would have told you that it was a little higher than the normal curb. But today she'd been seriously distracted—she was deeply involved in a conversation with her boyfriend who had asked her to marry him the night before.

Joe stumbled next. He was new to the big city. He had been gawking at the fast-moving traffic, tall buildings, and rushing throngs on their way to work. In the quiet suburbs where he lived, there weren't many pedestrians, and the curbs were all exactly the same height.

Mark was the last to stumble. He considered himself an excellent athlete but had twisted his ankle last night sliding into second base, trying to stretch a single into a double in the recreational softball league, and was using one of his father's canes this morning. He didn't misgauge the height of the curb—he planted the cane awkwardly in the street and almost lost his balance.

The street maintenance workers watching these behaviors concluded that the curb was unsafe and needed modification because it was a public health hazard.

Environmental psychologists study the myriad ways in which sociophysical **contexts** affect the behavior and health of individuals and groups. The contextual factors involved may include the kind of dwelling in which an individual resides, social and physical aspects of his or her neighborhood, and features of his or her commute between home and work. But environmental psychology is about more than objective descriptions of these factors. An individual's perceptions or feelings about each of these factors are likely to have an important bearing on his

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or her emotional and physical well-being, and these perceptions and feelings are also within the province of environmental psychology.

Environmental psychologists approach contexts as holistic, complex, naturally occurring, time-dependent entities. Moreover, they view the social and the physical dimensions of settings as highly interdependent (hence the term **sociophysical environment**) and as jointly influencing an individual's psychological and physical well-being. In contrast to traditional public health, environmental psychology focuses on all those factors that might influence an individual's health, including aspects of the physical and ambient environments, social relationships, and anything else that might result in environmental stress. A more encompassing term, **environment and behavior studies** (EBS), is sometimes used to refer to this field (Stokols, 1995).

This chapter explores key concepts, methods, and findings in the field of environmental psychology and their relevance to environmental health. The following approaches are typical of the field of environmental psychology:

- Research in the field of environmental psychology is centrally concerned with the behavioral, emotional, and health outcomes of people's transactions with their everyday environments (or *settings*). These environments may include residential, occupational, educational, recreational, public, and virtual places (Barker, 1968; Bechtel, 1997; Gifford, 1997; Proshansky, Ittelson, and Rivlin, 1976; Stokols and Montero, 2002).
- Research in this field favors naturalistic field studies over controlled laboratory experiments.
- Environmental psychology emphasizes a multidisciplinary perspective, incorporating ideas from all the branches of psychology, environmental design (architecture, landscape architecture, interior design, and urban planning), geography, sociology, human ecology, natural resources management, government, and public health.
- Environmental psychologists study behavioral and health outcomes in relation to both the objective features and the subjective meanings of built and natural environments.
- Environmental psychology focuses on users. A user is anyone who comes in contact with, is affected by, or interacts with a context.
- Environmental psychologists examine behavior within relevant time intervals. These *events* have naturally occurring beginnings and endings, and the relationship between contextual factors and health conditions and outcomes can change during the course of an event (Altman and Rogoff, 1987; Clitheroe, Stokols, and Zmuidzinas, 1998).
- Environmental psychologists emphasize a holistic and longitudinal approach to understanding the environment's impact on individuals; that is, they

consider the effects of multiple settings and contextual factors over time and these factors' cumulative or joint influences on health.

- The field of environmental psychology has always been committed to understanding and responding to important societal issues, including public health.

The field of environmental psychology thus offers a valuable reservoir of conceptual insights, methodological tools, and empirical findings for broadening the scope of environmental health practice and assisting it in becoming even more relevant to the present and future concerns of the field of public health.

## PERSPECTIVE

### The Trio of Tripping Pedestrians Revisited

Pat's, Joe's, and Mark's well-being was apparently threatened by a curb. But was this an accurate conclusion? Pat had stepped off that curb successfully hundreds of times; her well-being was in fact threatened this morning by a lack of attention that had nothing to do with the physical setting. Joe's well-being was threatened by his being a first-time visitor to the big city—in environmental psychological terms, by his lack of an adequate cognitive schema describing a dense urban setting and his status as a first-time way finder. Mark's health had already been affected by his recreational escapades of the night before. His stumbling had nothing to do with the curb but rather with his temporary disabled status and inability to plant the cane tip firmly in the street. The environmental psychologists who had also been observing this behavior had chosen to observe the interaction between the setting and its users from a distance, so that they wouldn't affect the natural interaction occurring in the context. They concluded that the curb at this location was not really the problem but that modifying it and adding wheelchair-accessible, curb-cut ramps would facilitate safer interactions between the curb and all its users.

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## EXPANDING THE PERSPECTIVE OF ENVIRONMENTAL HEALTH

The field of environmental health has focused largely on the deleterious effects of people's exposure to toxins, pathogens, radiation, and other hazardous conditions of the physical environment (Detels, McEwen, Beaglehole, and Tanaka, 2002; Koren and Bisesi, 2002; Yassi, Kjellström, de Kok, and Guidotti, 2001). Environmental psychology is more broadly concerned with conceptualizing,

measuring, and evaluating complex environmental settings such as buildings, neighborhoods, and public places and the ways these settings influence behavior, health, and well-being. Environmental psychologists consider health to be more than the absence of illness or injury and to include both physical and psychological well-being, or wellness.

The field of environmental health began to expand beyond its long-standing concern with the negative health effects of physical hazards, toxins, and pathogens at the same time the field of environmental psychology began to emerge as a viable discipline—in the turbulent social change and expanding ecological awareness of the 1960s. During this period, for example, Cassel (1964, 1976) urged public health researchers to give greater attention to the crucial role of social relationships in moderating individuals' resistance to hazardous environments. Cassel's research signaled a shift from germ theory accounts of health and illness (focusing on the adverse effects of specific pathogens once they invaded a human host) toward a social epidemiological model of public health and disease prevention, one that studies social determinants of health as well as physical and biological determinants.

During the 1980s, Lindheim and Syme (1983) reiterated Cassel's call for greater emphasis on social factors in health and highlighted the joint influence of multiple environmental dimensions (that is, the natural, social, symbolic, and built environments) on emotional and physical well-being. More recently, Frumkin (2001; see also Chapter Twenty-Four) described the "greening of environmental health" and underscored the importance of documenting the positive health outcomes associated with people's exposure to natural landscapes and wilderness settings. He has also identified several facets of healthy places and cited evidence suggesting that individuals' sense of place substantially affects their mental and physical well-being (Frumkin, 2003).

These and other efforts among researchers to broaden the scope of the field of environmental health reflect a convergence with some of the basic principles and themes of environmental psychology—especially an emphasis on salutogenic as well as pathogenic processes (Antonovsky, 1987) as they occur in relation to natural as well as built, social as well as physical, and subjective as well as objective dimensions of human environments (Bechtel and Churchman, 2002; Stokols and Altman, 1987).

### The Sociophysical Context of Health

Environmental psychology assumes that the health effects of our surroundings result from the confluence of a variety of contextual factors. The negative health effects of routine exposure to residential density and noise, for example, are more

severe in poor households than in affluent ones due to the cumulative effects of multiple environmental stressors faced by low-income families (Evans, 2004). Field experiments, similarly, have shown that persons exposed to cold viruses are much more likely to develop cold symptoms when they are experiencing high levels of stress in one or more areas of their lives (for example, in their relationships with family members, friends, or coworkers) than when they are reporting low levels of chronic stress (see, for example, Cohen and others, 1997a, 1998).

Clearly, a large number of life circumstances can affect the ways in which people respond to particular environmental demands. Yet identifying the many contextual factors that influence a person's health is a dauntingly complex task due to the large number of settings in which individuals participate on a day-to-day basis and the diverse physical and social factors they encounter in each setting. Moreover, each of these environmental factors can be considered in relation to diverse health criteria, ranging from the absence of physical injury and illness to states of complete wellness reflected in exceptionally high levels of emotional, physical, spiritual, and social well-being (O'Donnell, 1989; World Health Organization, 1986, 1997).

In establishing a basis for mapping sociophysical contexts of health, it is useful to begin by identifying a relatively small number of analytical categories, each of which subsumes a much larger set of environmental variables (Clitheroe and others, 1998; Magnusson, 1981). The basic units of environmental analysis are arrayed on different levels, or scales, ranging from specific stimuli that are part of the situations immediately experienced by persons in a particular setting or place (for example, being stuck in rush hour traffic, with horns honking and tempers flaring) to more complex life domains (for example, residential, employment, and educational environments) that are themselves clusters of multiple situations and settings (Table 5.1).

**Stimuli** are defined as observable features of objects or discrete conditions in an environment, such as the color of a table, the temperature level in a room, a sudden flash of light, or the occurrence of a loud noise (Pervin, 1978). **Situations** are sequences of individual or group activities and events that occur at a particular time and place (Forgas, 1979). **Settings** are socially structured and geographically bounded locations where certain kinds of activities and events recur on a regular basis-- for example, the college classroom to which one reports for a particular course at the same time each week or the favorite coffee shop one visits several times each month for a mocha Frappuccino (Barker, 1968; Schoggen, 1989; Stokols and Shumaker, 1981). **Life domains** are larger, more encompassing spheres of a person's life, such as all those activities, relationships, and settings that involve family, education, religion, recreation, or employment (Campbell, 1981). An even broader unit of contextual analysis can be defined,



TABLE 5.1 Levels of Environmental Analysis

Elemental	Water, air, earth, food, germs, physical substances, solids, gases, liquids.
Individual	An individual's (1) body and physical, perceptual, and cognitive abilities, and (2) intellectual abilities, personal beliefs, values, attitudes, emotions, memories, and experiences.
Stimuli	Discernible (by any sense) features of an environment that cause a personal perception or physical or psychological reaction, or both.
Situation	Sequences of individual or group activities and events that occur at a particular time and place—these may be unique or may occur at regular intervals.
Setting	Socially structured and geographically bounded locations where certain kinds of activities and events recur on a regular basis.
Life domain	Spheres of a person's life that encompass multiple situations and settings, for example, home, work, or school.
Societal	Overarching systems of beliefs and values, social and cultural norms, and social, political, and economic institutions that integrate life domains for large groups of people.

usually referred to as a person's overall life situation, that encompasses all the major life domains in which the individual is involved during a particular period of his or her life (Chapin, 1974; Magnusson, 1981; Michelson, 1985).

Altman and Rogoff (1987), in a seminal book chapter, describe four different "world views" in psychology: trait, interactional, organismic, and transactional. A **trait worldview** tries to understand and predict the enduring, consistent features of physical settings and people as individual factors. Most scientific disciplines start with this worldview by describing the basic units that will constitute their scope of interest. An **interactional worldview** posits stable relationships among traits and proposes basic "laws" that describe these relationships. In this worldview, once basic units are defined, scientific inquiry begins to look for simple and then increasingly complex relationships between these basic factors. An **organismic worldview** tries to understand larger, more complete, more complex aggregates of factors (for example, a community or a geographic region), acknowledging that these factors may change or evolve over time. In this worldview, after enough relationships among basic units are identified and explored, scientific inquiry begins to assemble holistic, complete models of the phenomena being considered. A **transactional worldview** proposes that the factors that affect behavioral phenomena are part of a constant, dynamic, reciprocal milieu. In this approach it becomes necessary to define a relevant period of time that includes the phenomena of interest. Altman and Rogoff

propose that a transactional worldview attempts to understand the world around us as a series of "events": a confluence of social and environmental factors with a natural beginning and a natural ending point in time. A good example of a smaller, more contained event is a localized epidemic. A good example of a very complex, large-scale event is the preparation for and response to a natural disaster, such as Hurricane Katrina.

Implied in a transactional approach to understanding natural disasters is that no two disasters are alike; they will differ in location, duration, warning, force, extent of damage, response, and impact. Thus it is important to learn from each event by understanding it as completely as possible and applying what is learned to potential contexts for future similar disasters. (An in-depth examination of

## PERSPECTIVE

### Hurricane Katrina: A Transactional Event

Assessments of the impact of Hurricane Katrina are uniformly bleak. As one commentator put it, "Katrina did not merely lay waste to a geographic region [Figure 5.1]; it also exposed every public policy failure essential to community and population health" (Rosenbaum, 2006). Why was the failure so endemic? Environmental psychologists would propose that the planning and preparation for natural disasters in the New Orleans area had been conducted at an interactional or possibly organismic level, whereas a hurricane is best conceptualized as a transactional event. The event that was Hurricane Katrina had three parts: (1) awareness and preparation, (2) immediate response, and (3) aftermath.

Environmental psychology can contribute a more comprehensive approach to understanding each phase of this event. Concepts that could be usefully applied to the entire event include **sense of place** (the unique characteristics of a place and the feelings or perceptions a place evokes in people) (Relph, 1976), **place attachment** (emotional bonding between people and their life spaces) (Stokols & Shumaker, 1981), and **contextual transformation** (sudden and dramatic context changes, resulting in fundamental behavior modification) (Clitheroe and others, 1998). The awareness and preparation phase focuses on risk perception and communication (Vaughan, 1993) and attitude change (Fishbein and Ajzen, 1975). The response phase focuses on the use of common setting features as "**affordances**" (possibilities for action that are latent in an environment) (Gibson, 1977) and that could prove useful during the immediate response. The aftermath phase focuses on environmental and psychological stress (Evans and Kantrowitz, 2002); individual,

the event that was, and continues to be, Hurricane Katrina is beyond the scope of this chapter. Among those beginning to explore this tragic event in detail are Rosenbaum, 2006, and Brunnsma, Overfelt, and Picou, 2007.)

### Three Principles of Contextual Analysis

Three basic principles of **contextual analysis** are common to environmental psychology.

1. *The relationship between environment and health is influenced by interdependencies among immediate situations, immediate settings, and more remote environmental conditions.*

**FIGURE 5.1** Destruction Following Hurricane Katrina



Source: FEMA/Marvin Nauman.

family, and community adaptation; and helping behavior norms and exceptions (Baum and Fleming, 1993). The aftermath phase of the 2005 Hurricane Katrina event is, unfortunately, ongoing.

Stimuli and situations are nested within larger units such as organized settings and places that are themselves subsumed by individuals' life domains, community activity systems, and societal conditions and trends (in, for example, economic, political, or cultural arenas). As environmental analyses shift their focus from smaller and simpler to larger and more complex levels, the potential range of contextual influences on mental and physical health expands dramatically due to the hierarchically nested structure of human environments.

For instance, when unemployment rates in a community are high, psychological and organizational stress associated with job insecurity is more prevalent and disruptive among coworkers at companies in that region (Dooley, 2003; Dooley, Fielding, and Levi, 1996). At the same time, workplace health and safety at the local level are directly influenced by state and national regulations aimed at protecting environmental quality and employee health (Stokols, McMahan, Clitheroe, and Wells, 2001). A more dramatic and tragic example of the interdependencies between local and remote environments is the syndrome of chronic emotional stress and health impairment triggered by the terrorist attacks of September 11, 2001, not only among Americans residing in or near New York City, Washington, D.C., and Shanksville, Pennsylvania, but also among those living hundreds or thousands of miles away from the attack sites (Silver and others, 2002). These examples suggest a second principle of contextual analysis.

2. *The different environments in which an individual participates exert a cumulative, synergistic effect on his or her health.*

Bronfenbrenner (1979) emphasized the ways in which functional linkages between two or more settings (such as an individual's family and occupational environments) and connections with other more distant settings in which an individual does not directly participate (for example, the workplaces of a child's parents) can affect development and well-being. Such multilevel, integrative analyses can identify subtle relationships affecting health (for example, stressful experiences at work that impair the quality of parents' interactions with their children at home). Particularly important in a world of expanding communication and entertainment media is Bronfenbrenner's concept that the overarching societal system of beliefs, social and cultural norms, and political and economic institutions and events surrounding individuals and groups also influences the health and well-being of those individuals and groups. (This relates to the concept of cumulative risk assessment, as discussed in Chapter Eight.)

The combined influence of multiple settings and life domains on individuals' health has been observed in several studies and is recognized in the third general principle of contextual analysis.

3. *Health is the result of an interaction among the objective features of the environments in which individuals participate, individuals' perceptions of those features, and individuals' personal attributes.*

That is, the impact of particular stimuli, situations, settings, and life domains on a person's health depends not only on the objective features of an environment but also on the person's individual attributes (for example, genetic heritage, psychological dispositions, and coping resources) and on his or her subjective interpretation of the environments in which he or she participates. For instance, when children are exposed to environmental stressors such as crowding and noise in both their home and school environments, these exposures cause additive effects on their health (for example, elevated systolic and diastolic blood pressure) and academic performance (Cohen, Evans, Stokols, and Krautz, 1986). In other studies, employees' perception that they lacked the flexibility to schedule children's doctor visits during working hours led to their underutilization of employer-provided family health benefits (Fielding, Cumberland, and Pettitt, 1994), with long-term negative health consequences for the family. Studies have also documented both the negative health consequences of work-family conflict and the positive effects of spousal support in buffering work-related stressors (O'Neil and Greenberger, 1994).

More precise hypotheses about the links between environmental factors and their effects on health can be derived by developing and testing more specific theories of the relationship between persons and their environment that identify (1) those situations and settings in a person's life that have the greatest impact on his or her health and (2) the ways in which personal attributes or individual differences (involving, for example, personality, cognition, gender, age, education, or income) mediate the effects of environmental conditions on emotional and physical well-being. These are examples of applying an interactional worldview.

Understanding these multiple settings and environments and their interaction constitutes a daunting research challenge. It requires data on individuals nested within areas or neighborhoods (Diez Roux, 2001). Analytical methods able to assess these complex relationships are emerging from the fields of environmental health (multilevel analysis), urban planning (geographic information systems, or GISs), and the behavioral sciences (hierarchical linear analysis).

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## HEALTH EFFECTS OF THE CHANGING NEIGHBORHOOD

The **neighborhood** is an especially appropriate context in which to consider the links between environment, behavior, and health, for at least three reasons. First, the neighborhood is a sufficiently broad contextual unit to encompass a variety of stimuli, situations, settings, and life domains relevant to health. Second, the concept of neighborhood is not peripheral to people's day-to-day activities and concerns but plays a central and meaningful role in determining individuals'

physical and psychological well-being and quality of life. And third, although the neighborhood has been long regarded as a geographically, psychologically, and socially meaningful unit of analysis in the fields of sociology, public health, planning, and community and environmental psychology, the concept of neighborhood is currently undergoing fundamental rethinking and change among scholars in several fields due to the advent of digital and mobile communications.

A person's neighborhood is no longer viewed simply as a contiguous, geographically delimited, relatively stable arena of his or her daily activities. People now participate concurrently in multiple, separate, and sometimes isolated geographically defined places and in a number of independent socially defined networks. Some of these places and networks are real (involving a physical space or place), and others are less real (involving a virtual space) and more mobile. Thus consideration of contemporary changes in the structure and functions of the neighborhood offers an opportunity to explore exciting new lines of research concerning the impact of digital communications and virtual communities on people's psychological attachment to places and their overall well-being (see, for example, Blanchard and Horan, 1998; Meyrowitz, 1985; Stokols, 1999; Wellman and Haythornthwaite, 2002).

Traditional definitions of neighborhood emphasize geographic location, unique physical features (such as architectural styles and public parks), the social attributes of residents, and residents' objective participation in and subjective identification with the area (Altman and Wandersman, 1987). For instance, Rivlin (1987) states:

When we speak of contemporary neighborhoods, we are talking about a very heterogeneous unit based on the nature of the geography, the numbers and kinds of people there, the socioeconomic status of these people, their ages, cultural background, and housing form. . . . The criterion of a neighborhood is the acknowledgment by residents, merchants, and regular users of an area that a locality exists. It presumes some agreement on boundaries and a name and the recognition of distinguishing characteristics of the setting. . . . The recognition by people of a bounded territory as having an integrity and personal meaning is, in my view, the necessary requirement of a neighborhood [pp. 2-3].

Researchers are, however, beginning to recognize that neighborhood contexts may be related to public health in ways independent of place-based attributes (Diez Roux, 2001). According to this emerging view, people's communications and relationships with others are no longer constrained by geography but occur instead within highly personalized digital communication networks unbounded by space and time (Negroponte, 1995; Rheingold, 1993). For instance, Wellman (2001)

observes that the "importance of a communication site as a meaningful place will diminish even more. The person—not the place, household, or workgroup—will become even more of an autonomous communication node" (p. 233).

In this discussion, rather than adopting either the traditional view that local neighborhoods are the most important context of people's day-to-day transactions with their surroundings or the revisionist view that place-based neighborhoods are no longer important sources of community and well-being, we offer an integrative conceptualization of neighborhood. It recognizes the complementarity of geographically bounded and virtually dispersed neighborhood functions.

Specifically, we define the new neighborhood as consisting of those people, places, and technologies that enable the sociophysical interactions that define everyday life. This definition assumes that people's psychological ties with local, place-based environments are an important source of their identity and well-being (Proshansky, Fabian, and Kaminoff, 1983; Unger and Wandersman, 1985), but it also recognizes that the number and scope of individuals' psychologically meaningful neighborhoods (such as those based at home, at school, at work, or in public community settings) have expanded and that in addition to being linked by physical proximity individuals can now be closely linked with each other through the Internet and mobile digital communications (Brill and Weidemann, 2001; Wellman and Haythornthwaite, 2002). This emerging view of neighborhoods incorporates both the real and the virtual aspects of an individual's or a family's experience of neighborhood, both of which respond to the same basic human needs (Table 5.2).

**TABLE 5.2 Functions of Both Real and Virtual Neighborhoods**

Affiliation	Facilitate communication and interaction between individuals and groups.
Identity	Provide a definable group character (name, style, real or virtual landmarks) for assimilation by individuals and an opportunity to contribute to the development of that character and to the individual's own self-concept.
Social support	Offer psychologically reinforcing interactions between individuals or within groups.
Community	Offer a connection to the opportunities provided and demands made by larger social units.
Information	Provide awareness of and access to information the individual finds essential to successful daily life and the accomplishment of personal goals.
Daily life	Assist with the basics: acquisition and maintenance of food, shelter, safety, convenience, and comfort.
Recreation	Supply opportunities to physically or mentally refresh, to play, to explore, to challenge oneself, to learn and grow.

## Features of Neighborhoods

A person's neighborhood includes all those physical and virtual settings he or she uses regularly. Some of these settings are located inside buildings, some are located outdoors, and some are virtually located in cyberspace. Virtual neighborhoods arise when people routinely communicate and congregate electronically, with no need for a physical, geographically defined place in which to come together. The following discussion of neighborhood settings presents several examples of environmental psychology's concepts and research that describe contextual factors related to public health. We start with physical settings and conclude with virtual ones.

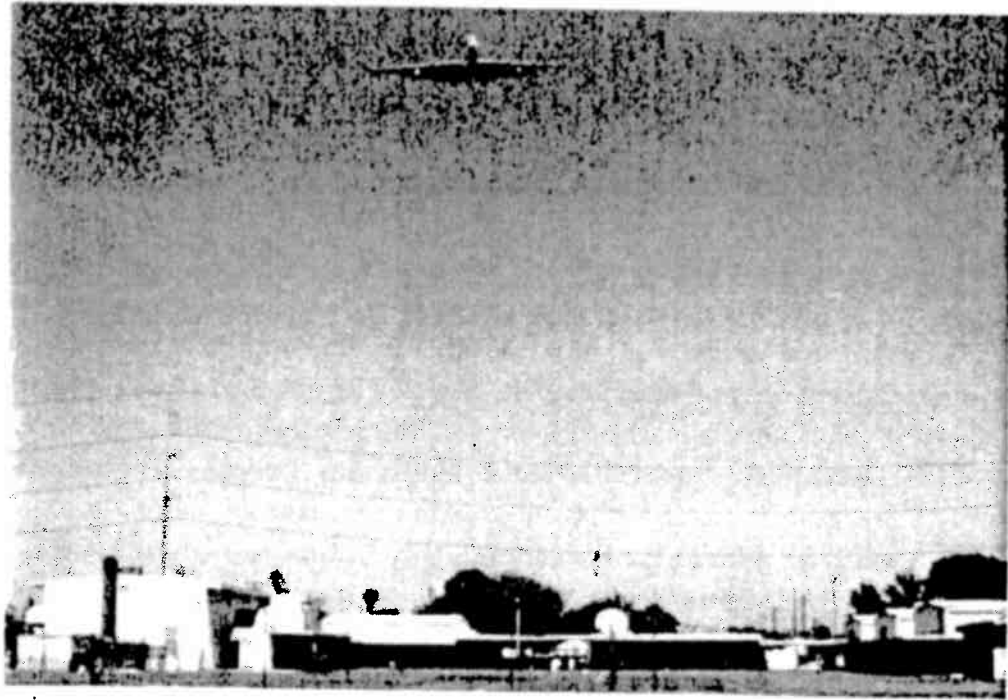
**Indoor Neighborhood Settings** Indoor neighborhood settings include dwellings, classrooms, workspaces, indoor recreation facilities, places for socialization, places for worship, and local commercial settings such as markets, shops, and restaurants. Physical characteristics include building design and furnishings, entrances, exits, and windows. Ambient conditions include lighting, air quality, temperature, humidity, sound, and color. Social conditions include the solitary individuals or groups who use or in some way interact with a place.

Environmental **stress** is any demand made on an individual by an environment (physical or social). Thus environmental stressors may be considered stimuli, requiring a physical or psychological response. Pioneering work by Selye (1956) defined the physiological response to injury, illness, or other environmental stressors: elevated blood pressure, enlarged adrenal glands, both increases and decreases in gastrointestinal secretions and motility, and impaired immune function. Psychological stress can occur when perceived environmental demands exceed the individual's perceived ability to cope with them. Such stress may be caused by experiences of isolation, irritability, or interpersonal conflict. The individual's subjective interpretation of an environment (for example, whether or not its demands seem overwhelming or manageable) plays a major role in determining the severity and persistence of psychological stress reactions.

Research on environmental stress has shown, for example, that chronic exposure to high levels of noise leads to a variety of health impairments. For instance, when children living in noisy dwellings near congested roadways or attending schools under the flight path of a busy airport (Figure 5.2) were compared to children occupying quieter environments, chronic noise exposure was found to be associated with impaired hearing and reading skills, lower levels of academic achievement, and elevated blood pressure (Bronzaft, 2002; Cohen and others, 1986; Cohen, Glass, and Singer, 1973; Evans and others, 2001; Hygge, Evans, and Bullinger, 2002). Similarly, prolonged experiences of crowding in dormitories, apartments, and homes have been linked to dysfunctional social behavior, feelings of isolation, and emotional distress (Baum and Epstein, 1978; Baum and Valins, 1977; Evans and Lepore, 1993).



FIGURE 5.2 Airplane Coming In for Landing over an Elementary School in Los Angeles



One of the reasons why noisy or crowded interior spaces provoke psychological stress among their occupants is that they typically lead to prolonged feelings of stimulation overload, distraction, frustration, and fatigue (Baum and Epstein, 1978; Evans and Johnson, 2000; Milgram, 1970). In settings with large numbers of people (spatially dense settings), an additional source of psychological stress is the difficulty occupants encounter in their efforts to regulate interpersonal privacy and personal space (Altman, 1975; Sommer, 1969). Coresidents and coworkers who are able to establish and maintain effective guidelines for the use of shared spaces (for example, through personalization and decoration of spaces in a shared residence or workspace) are better able to remain individually and collectively productive and to avoid interpersonal conflict and distress (Brill and Weidemann, 2001; Sundstrom and Sundstrom, 1986; Taylor, 1988).

To the extent that individuals can gain some measure of real or perceived control over environmental stressors such as noise, crowding, and infringements on privacy, they are able to avoid both the immediate and delayed effects of these stressors on their performance and well-being (Cohen, 1980; Evans, 2001; Glass and Singer, 1972). Perceptions of environmental controllability and predictability

enable individuals to maintain high levels of emotional and physical well-being, even in the context of highly demanding settings. For instance, elderly persons living in institutionalized residential care facilities who were encouraged by staff members to take personal responsibility for the maintenance and beautification of their own living spaces (for example, by caring for plants placed in their bedrooms) exhibited higher levels of emotional and physical well-being than those who were not encouraged to assume those responsibilities (Langer and Rodin, 1976; Rodin and Langer, 1977; also see Schulz and Hanusa, 1978).

**Outdoor Neighborhood Settings** Just as physical conditions such as noise and high spatial density influence the quality of social interactions indoors, an interdependence between physical and social conditions is evident in outdoor spaces (Alexander and others, 1977; Altman, 1975). For instance, loud noise (at or above 85 decibels) from a lawnmower operating near the sidewalk in a suburban neighborhood significantly reduced pedestrians' attentiveness to the needs of others (specifically, to the needs of a person wearing an arm cast who had dropped a stack of books near his car) and their willingness to stop and render assistance (Mathews and Canon, 1975).

In another study the linear distance between the front doors of apartments in a Massachusetts Institute of Technology student housing complex (a physical dimension) reliably predicted which residents happened to meet each other and eventually became friends (Festinger, Schachter, and Back, 1950). Moreover, neighbors whose apartments were further apart but who met regularly at group mailboxes, a basketball court, or in the parking lot (social dimensions) were more likely to form friendships than those who lived far apart and did not "run into" each other regularly.

The influence of sociophysical environmental factors on friendship formation has important health implications. Most immediately, the presence of friends who live close by and can render assistance when called upon improves the sociability, or social climate, of the neighborhood (Moos, 1979). A positive social climate is in turn seen as a form of social capital and can contribute to residents' perceptions of security and neighborhood safety (Putnam, 2000). Other research suggests that socially isolated individuals are more susceptible to illnesses of various kinds—even premature death—than are those who are actively involved in mutually supportive friendship, family, religious, and professional networks (Berkman and Syme, 1979; Cohen and others, 1997b, 2003).

The sociability of neighborhoods can be undermined by the presence of physical and social incivilities. **Physical incivilities** include the presence of litter, graffiti, protective bars on windows, evidence of street disrepair (for example, broken curbs and potholes), poor building and exterior maintenance

(for example, peeling paint, unkempt yards, and overgrown landscaping), and damage to buildings (for example, broken windows) (Nasar and Fisher, 1993; Perkins, Wandersman, Rich, and Taylor, 1993). **Social incivilities** include displays of public drunkenness, the presence of gangs or prostitutes, excessive numbers of liquor stores, stores offering pornography, and a generally unfriendly or threatening atmosphere in the neighborhood (Holman and Stokols, 1994).

One consequence of environmental incivilities is the stigmatization of a neighborhood, accompanied by reduced social and economic investment in the area, greater fear of crime, and higher rates of victimization and injury among residents and visitors. Neighborhoods, such as South Central Los Angeles, that have experienced widely publicized civil violence are particularly prone to this downward spiral of stigmatization, disinvestment, and crime. Concerted efforts to remove physical cues such as disrepair and to encourage the development of prosocial events, including street and cultural fairs, drama or music festivals, and community gardening programs, can reverse this negative trend (Garland and Stokols, 2002; Lewis, 1979).

Other architectural and site-planning strategies can be applied to create outdoor spaces that enhance the social climate and security of residential and commercial areas. **Defensible space** (Newman, 1973) refers to those features of an environment that "combine to bring it under the control of its residents" (p. 3). For instance, apartment buildings can be sited on blocks so as to create natural buffer zones easily surveyed by residents, and apartment windows can be positioned to facilitate surveillance of semipublic areas adjacent to the building. Changes in elevation, landscaping, and signage also can be used to mark transitions between public and private areas (Alexander and others, 1977). In a study of Salt Lake City neighborhoods, Brown (1985) found that homes characterized by defensible space design (for example, the presence of actual or symbolic barriers such as fences or hedges surrounding the property and physical traces of residents' presence (such as lights on in the home) were less likely to have been burglarized than were residences lacking those features. This body of environmental psychology research has become institutionalized in the form of guidelines promoted by police departments and adopted by cities and counties throughout the United States (Newman, 1966).

**Neighborhoods as Wholes** A neighborhood can be described not only in terms of buildings, sidewalks, open areas, parks, shops, and streets but also in terms of larger factors that contribute to its distinctive identity or overall atmosphere (Inelson, 1973). For instance, Lynch (1960) defines **imageability** as an environment's memorability; its capacity to evoke strong visual memories of its physical features among residents and visitors. According to Lynch, the likelihood that an

environment will evoke a vivid image in an observer depends on its visual clarity, or “legibility – the ease with which its parts can be recognized and organized into a coherent pattern” (p. 3). The imageability and **legibility** of a place derive not only from its physical features but also from social meanings. In a study of Parisians’ cognitive maps, Milgram and Jodelet (1976) found that certain areas of the city were remembered more for their social and historical meanings than their distinctive physical or visual attributes.

Both the social and the physical imageability of a neighborhood can affect the well-being of residents and visitors in at least two ways. First, visually legible environments are less confusing and easier to navigate than others, enabling pedestrians and drivers to feel more secure, to arrive at their destinations more efficiently, to enjoy their experience of the neighborhood, and to avoid potentially unsafe areas; these are all experiences that decrease environmental stress. Second, the presence of widely recognized and shared cultural or symbolic meanings can contribute positively to the sociability and supportive climate of a place, thereby increasing social capital and promoting norms of cooperativeness, trust, and engagement with others (see, for example, Putnam, 2000) while also reducing crime rates and fear of crime in the area. All of these factors contribute to the health of the neighborhood and of the people who live, work, and play there.

An important neighborhood quality that contributes to its social climate is the number and diversity of its behavioral settings, including recreational, commercial, cultural, educational, and civic places (Barker and Schoggen, 1973; Jacobs, 1961). The presence of multiple settings geared to the interests and activities of diverse groups of residents and visitors (children, adolescents, young adults, elderly persons, and various cultural and ethnic groups) promotes active interchange among these groups and contributes to the overall vitality of the neighborhood and the quality of life for its residents and visitors. Conversely, an overabundance of certain settings, such as fast-food restaurants, may have a negative influence on residents’ well-being. In a recent study of the “economics of obesity,” Rashad and Grossman (2004) found that a major factor in the rise of obesity in the United States between 1980 and the present is the dramatic growth in the per capita number of fast-food and full-service restaurants during those years. According to this research, as much as two-thirds of the increase in adult obesity since 1980 can be explained by the rapid expansion of the restaurant industry and the increasing tendency of U.S. adults and children to eat their meals at fast-food and full-service restaurants (Figure 5.3). Thus a prevalence of fast-food settings (which generally serve high-fat, high-calorie meals) and abundant opportunities for families to dine out in a neighborhood may have a deleterious effect on residents’ health.

Among the most important neighborhood settings are what Oldenburg (1999) refers to as **third places** – “the variety of public places that host the regular,

FIGURE 5.3 Cars Waiting in Line for Fast-Food Service



voluntary, informal, and happily anticipated gatherings of individuals beyond the realms of home and work” (p. 16). (Home and work are, respectively, individuals’ first places and second places.) Third places such as local bookstores, coffee shops, parks, and other popular hangouts (such as Ghirardelli Square in San Francisco, shown in Figure 5.4) serve as “core settings of informal life.” Oldenburg contends that third places offer people escape and relief from the psychological stress of work and family responsibilities and strengthen their sense of belonging to the community and thus their overall well-being. Interestingly, Florida’s (2002) research on the **creative class** suggests that regional economic growth and job opportunities in the United States are fueled by where creative people, who represent 30 percent of the workforce, choose to live. One of the attributes creative people seek when deciding whether to move to a particular area is a diverse mix of third places—neighborhood settings that offer recreational resources such as a vibrant nightlife and opportunities for social and cultural exchange.

In some localities schools may become third places. A recent positive example of neighborhood change involved the conceptualization of neighborhood public schools as places that can “improve overall health in densely populated communities” when they are designed as “mixed-use, neighborhood-centered” facilities that provide “much needed, neighborhood-based health and human services . . . [and] safe, convenient spaces for children and their families to walk, run, participate in sports and otherwise enjoy being outdoors” (Abel and Fielding, 2004, p. M2).

FIGURE 5.4 Ghirardelli Square in San Francisco



In addition to third places, the aesthetic quality of neighborhood environments, the presence of nature (for example, lakes or forested parks) at all environmental levels (see Table 5.3 and Figure 5.5), and the provision of resources for physical activity (for example, bike trails and public parks) all contribute positively to residents' mental and physical health and to the neighborhood's sense of place. Natural areas in a neighborhood offer residents a respite from their daily work routines as well as opportunities for emotional restoration and recovery from mental fatigue (Kaplan and Kaplan, 1989). Similarly, urban design features can either encourage or discourage residents' engagement in physical activity, activity that could be an antidote to the obesity pandemic currently rampant in the U.S. population (Frank, Engelke, and Schmid, 2003). (The links between access to nature and well-being and between urban design and physical activity patterns are discussed more fully in Chapters Fourteen and Twenty-Four.)

**Virtual Neighborhoods** We now consider the ways in which the Internet and digital communications have given rise to a fundamentally new type of neighborhood—**virtual communities** located in cyberspace, that complement (and sometimes complicate) people's transactions with their place-based environments.

The computing revolution and the rapid expansion of the Internet during the 1980s and 1990s (Kiesler, 1997; Kling and Iacono, 1991) have dramatically

TABLE 5.3 The Presence of Nature

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Elemental	Natural scents (incense)
Individual	Natural objects (driftwood, shells, stones, plants) Clothing choices Eating choices
Stimuli	Natural sounds (birdsong, rain, wind in trees) Natural surfaces (wood, rock, grass, sand, water) Natural colors and textures (earth tones, burlap) Views of nature through windows Natural images (pictures of natural places)
Situation	Outdoor meetings, meals, and entertainment Gardening
Setting	Outdoor recreation Outdoor relaxation or meditation
Life domain	Outdoor occupations Location of residence and workplace Mode of transportation and routes
Societal	Nature preserves and wilderness areas Protected seashores, rivers, and lakes Regional, national, and international ecological conventions and agreements

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FIGURE 5.5 Neighborhood Green Space in Irvine, California



altered people's transactions with their environments in at least three ways. First, the emergence of the Internet and digital communications has made it much easier for individuals to be in contact even when they are geographically or temporally remote from each other. Second, the Internet has facilitated the development of virtual behavioral settings and virtual neighborhoods such as chat rooms, listservs, bulletin boards, information pooling sites such as Wikipedia, social networking sites such as Facebook and Twitter, and electronic commerce sites such as eBay and Amazon.com, each located at a particular "address" (URL) in cyberspace. Like real places, these virtual settings are frequented by users or members on a regular basis, and these individuals develop widely shared norms concerning appropriate social behavior and etiquette (Blanchard, 1997; Blanchard and Horan, 1998). Moreover, the members of virtual communities (such as the Palace and the Well) tend to identify strongly with these sites and fellow members (Rheingold, 1993). Third, because individuals are present in or at a specific physical place at the same time that they are participating in a virtual setting via computer contact or cell phone conversation, they must simultaneously pay attention to information from both their immediate sociophysical environment and their virtual environment.

This concurrent processing of information generated by place-based and virtual settings raises the possibility that certain conflicts between these two realms of experience will occur and that negative health impacts (such as traffic crashes caused by the use of cell phones while driving) may be a consequence of those conflicts. The proliferation of real-virtual situations incorporating at least one real setting (place-based) and one virtual setting (accessed from a desktop computer, laptop, hand-held device, or cell phone), raises novel questions about the relationships between environment, behavior, and health (see, for example, Stokols, 1999). For example, real-virtual conflicts arise when parents engage in chat room activities on a home computer and become less responsive to the needs of their children, or when employees inappropriately "surf the Internet" while at their workplaces, arousing the resentment of coworkers and supervisors who are more focused on job-related tasks. These examples illustrate the kinds of interpersonal, family, and organizational strains that may result from a conflict between real and virtual settings.

Social strains and interpersonal conflicts are not the only health problems prompted by the overlap of real and virtual settings. Another major threat to an individual's well-being is the **stimulation overload** (see, for example, Milgram, 1970) that results from chronic multitasking, such as simultaneously communicating with a person in a real setting and a person in a virtual setting in an attempt to accomplish diverse tasks in a short period of time. The digital electronic revolution has subjected large segments of the population to



an onslaught of communications transmitted via desktop and laptop computers, hand-held devices, cell phones, and fax machines. The rapid rise in e-mail communications—both more users and more e-mail messaging per user—has been recorded in a number of recent studies (for example, International Technology and Trade Associates, 2000; Lyman and Varian, 2000; Nie and Erbring, 2000; Wellman and Haythornthwaite, 2002; Messagingonline, 2000). This communications explosion has resulted in individuals' becoming more susceptible to distraction, information overload, and mental fatigue (Mark, Gudith, and Klocke, 2005; Mark, Gonzalez, and Harris, 2005). When these conditions persist, individuals can experience **attentional fatigue**, which has been closely linked to greater irritability, reduced sensitivity to the needs of others, and errors in occupational settings—for example, situations involving physicians, nurses, air traffic controllers, and automobile drivers that threaten health and life (Cohen, 1980; Kaplan and Kaplan, 1989; Kohn, Corrigan, and Donaldson, 2000).

Although conflicts between uses of real and virtual settings are common, place-based neighborhoods can also benefit from residents' participation in virtual communities. Blanchard and Horan (1998), for instance, distinguish two types of virtual communities: place-based and geographically dispersed. Place-based communities of interest are exemplified by the Blacksburg Electronic Community ([www.bev.net](http://www.bev.net)), an Internet site developed by the residents of Blacksburg, Virginia, for the purposes of facilitating social and commercial exchanges among individuals and groups in the city and enhancing the sense of community and sense of place in Blacksburg. Geographically dispersed communities of interest are those in which most participants do not communicate face to face or even by telephone. Examples include health support groups on the Internet as well as Web sites featuring hobbies or shared intellectual, political, artistic, literary, or recreational interests. Even though these virtual communities do not directly reinforce a sense of place, they do enrich the quality of life in place-based neighborhoods by delivering valuable information, services, and support to neighborhood residents.

Not all members of place-based neighborhoods, however, have access to virtual settings, due to limited financial resources or educational backgrounds. The rift between information-rich and information-poor segments of the population is referred to as the **digital divide** (Garces, 2000; National Telecommunications and Information Administration, 2000; Servon, 2002; Mossberger, Tolbert, and Stansbury, 2003). People who find themselves on the wrong side of this divide are frequently caught in a downward spiral of increasing poverty because they have little access to job opportunities that require training in information technology. If this problem is not redressed, the resulting social divisions and inequity may provoke the same sort of social conflict, community destabilization, and health impairments (including lack of access to health care) that led to widespread social

upheaval in the 1960s. Thus, narrowing the digital divide remains an important priority for future environmental and health research and public health policy.

### Summing Up the Example of Neighborhoods

A focus on neighborhoods highlights the unique contributions of environmental psychology to public health.

- Neighborhoods are large enough to reveal the complex relationships between the physical environment and people that constitute “real life,” and yet small enough that most social and physical factors influencing a target behavior (for example, childhood obesity) can be effectively considered and synthesized.
- Although varying widely across cultures and locales, neighborhoods contain many common elements that allow useful comparisons: climate; geography; natural ecological status; residential types, styles, and amenities; transportation modalities and routes; commercial enterprises; public utilities; economic relationships; educational facilities; religious and other social organizations; public governance; and cultural heritage.
- The effects of these and other neighborhood factors on individual and group physical and psychological health and well-being can be effectively modeled and analyzed, and the results generalized to a broader societal context.
- A neighborhood focus allows researchers in environmental psychology to employ useful perspectives from many disciplines—such as sociology, environmental design, political science, urban planning, anthropology, social psychology, and of course public health—and to use other fields’ tools as well, such as GISs.
- The concept of neighborhoods is proving useful to understanding the impact of modern telecommunication and computing technology on social and sociophysical relationships—that is, to understanding the differences between real environments and virtual environments—and to exploring the emerging perspective on neighborhood that integrates both real and virtual environments.

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## LOCAL TO GLOBAL LEVELS OF ANALYSIS

Environmental psychology encompasses multiple levels of analysis. From the smallest microlevel context to the largest holistic context, environmental psychology brings the same focus to bear: environmental influences on the cognition, behavior, and well-being of human participants in that context.

Global climate change offers an excellent example of the range of levels of analysis encompassed by environmental psychology. Global climate change is best approached from an organismic perspective, that is, as a very large, complex, and slowly evolving set of environmental conditions with a wide range of ecological and human impacts. The recent worldwide focus on this global challenge is likely only to become more intense, especially as the connections between different levels of analysis and the potentially catastrophic results of the changes become better defined (Gore, 2006; see also Chapter Ten). Moreover, the "public health response to [climate change] requires a holistic understanding of disease and the various external factors influencing public health. It is within this larger context where the greatest challenges and opportunities for protecting and promoting public health occur" (Gerberding, 2007, p. 1).

**TABLE 5.4 Behavioral Impacts of Displacement Due to Climate Change:  
From Global to Local**

Level of Analysis	Climate Change	Behavioral Impact
Global (continental)	Global temperature rise leads to rise in sea level and magnifies impact of natural disasters	Massive population dislocation
National (subcontinental)	Heat, prolonged drought	Changes to and disruption in food production and distribution
Regional (state)	Greater ozone and particulate air pollution	Increased cardiovascular and respiratory disease
Community	Long-term infrastructure damage, especially for public utilities and transportation	Functional disruption leading to scarcity of necessary resources (potable water, electricity, gas, sanitation), damage to and inaccessibility of health care facilities
Neighborhood	Disproportionate social and economic impacts	Inability of neighborhood to recover, neighborhood decay, disruption of social networks, permanent displacement of population
Residential (family)	Loss of shelter, of social and public support, and of contact with extended family	Family separation, conflict, deprivation, long-term negative economic impact, educational disruption, exacerbation of medical conditions
Individual	Disruption of life domains due to all of the factors listed here	Dramatic increase in environmental (psychological) stress, malnutrition, loss of income, poverty, inadequate medical care

Global climate change can have, in fact is already beginning to have, a number of serious public health impacts (in environmental psychology terms, *behavioral outcomes*), including death and illness from heat waves; death and injuries from severe weather events such as hurricanes, tornadoes, and floods; increased levels of air pollutants and allergens, aggravating respiratory and cardiovascular diseases; reduced water quality and quantity; and increased risk of vector-, food- and waterborne diseases (see Chapter Ten).

Although many of these impacts are experienced by the affected population in situ, other impacts, especially catastrophic events, result in the **displacement** of large numbers of people under very difficult circumstances. The study of displacement is not new (Pastalan, 1983). Fullilove (2004) thoroughly explores the communal, family, and personal impacts of large-scale displacement due to U.S. urban renewal programs in the 1960s and 1970s. Displacement due to catastrophic events presents an effective, if unfortunate, opportunity to describe the full range of behavioral impacts on affected populations.

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## SUMMARY

This chapter has presented the field of environmental psychology as a useful vantage point for understanding a wide variety of relationships between environment and health. Several important topics that expand the conceptualization of environmental health have been introduced:

- Theory and research in environmental psychology are providing a broader conceptualization of the sociophysical context of health than has been typical of the traditional focus of the field of environmental health on the adverse effects of exposure to specific toxins, pathogens, and hazardous conditions of the physical environment.
- Similarly, environmental psychology is adopting a broader stance toward health itself, considering *good health* to be both the absence of injury or illness and the presence of well-being for individuals and groups.
- Environmental psychology adopts a concept of the environment that includes both objective and subjective perspectives and physiological and psychological health outcomes.
- A revised understanding of neighborhood has been developed in this chapter and used to introduce a wide range of concepts, research, and findings related to individual and social behavioral outcomes as they, in turn, influence personal and population health outcomes.
- The discussion of real and virtual settings and communities has revealed

several potentially adverse as well as beneficial impacts on individuals and groups that have direct consequences for the safety and health of neighborhood residents.

The incorporation of environmental psychology concepts and research results can enlarge the scope and effectiveness of public health programs and policies. Studies of environment and health should give greater attention to health-enhancing as well as pathogenic processes as they occur in relation to the natural and built environments, and to the cumulative influence of conditions experienced by individuals across multiple settings and life domains. This more fully contextual perspective, incorporating the joint influence

of multiple environmental settings and factors on health, is exemplified by recent studies of the adaptive burdens faced by individuals, especially members of low-income and ethnic minority groups—burdens resulting from their chronic exposure to multiple social, physical, and economic environmental stressors (Bullard, 1990; Evans, 2004; McEwen and Stellar, 1993; Taylor, Repetti, and Seeman, 1997; see also Chapter Eight). Finally, the rapidly expanding prevalence of telecommunications and virtual communities (incorporated here into an expanded definition of neighborhood) and the multifaceted role of the Internet as both a resource for health promotion and a source of health problems have emerged as important topics for future environmental health research.

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## KEY TERMS

affordance	imageability	situations
attentional fatigue	interactional worldview	social incivilities
context	legibility	sociophysical environment
contextual analysis	life domains	stimulation overload
contextual transformation	neighborhood	stimuli
creative class	organismic worldview	stress
defensible space	physical incivilities	third places
digital divide	place attachment	trait worldview
displacement	sense of place	transactional worldview
environment and behavior studies	settings	virtual communities

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## DISCUSSION QUESTIONS

1. Make a list of the ways that you communicate with your friends and acquire information about the world. Then make lists of the ways your parents and grandparents communicated and acquired information when they were your age. Then add to your lists the places that facilitate or enable (in your case) and facilitated or enabled (in your grandparents' case) these communication and information activities. What are the potential health consequences of the changes you note in these lists? (Hint: consider the factors listed in Table 5.2.)
2. What physical and social factors that differ between low-income and high-income neighborhoods have implications for the health of residents? (Hint: Think about the quantity, variety, and quality of the first, second, and third places available to residents of each type of neighborhood.)
3. Draw a large circle on a piece of paper. Around the *left* side of the circle, write words or phrases that describe important physical aspects of your current home or residential environment (for example, "private bedroom," "outside garden/yard," "comfortable," "spacious" or "cramped," "relaxing"). Around the *right* side of the circle, write words or phrases that describe important *social* aspects of your current home or residential environment (for example, "no privacy," "safe," "quiet," "great for parties," "good for quiet dinners," and so forth). Then draw lines (always going through at least part of the circle) to connect items strongly related to each other (such as "garden" and "relaxing"). A line may connect a physical and a social aspect, two physical aspects, or two social aspects. How complex are the relationships between these sociophysical factors in your residential setting? Which seem most important: that is, which exhibit the most connections to other factors? (To extend this discussion, consider these questions: Which factors might be related to the health of the residents of your home environment? Which of these factors is the most important?)
4. Consider the route you take most often to get to and from school. Do you consider it stressful or relaxing? Why? What do you listen to, that is, what kind of information do you absorb along the way? What options are available to you on this route (fast-food restaurants, natural views, dense urban scenes, light traffic, and so forth)? How does each of these contextual factors affect your mood, your expectations about the day ahead, your readiness to learn, and your overall health?
5. Select one of the following significant issues with important public health impacts: AIDS in Africa, war in the Middle East, destruction of rainforests, global financial recession, international terrorism, dependence on carbon fuels (oil), or poverty in major metropolitan areas. Using Table 5.4 as a template, identify specific impacts and related behavioral or health outcomes for each level of analysis, from global to local.

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## FOR FURTHER INFORMATION

### Journals

*Environment and Behavior*, <http://eab.sagepub.com>.

*Journal of Environmental Psychology*, [http://www.elsevier.com/wps/find/journaldescription.cws\\_home/622872/description#description](http://www.elsevier.com/wps/find/journaldescription.cws_home/622872/description#description).

*Journal of Architectural and Planning Research*, <http://www.lockscience.com>.

### Academic Programs

City University of New York, Department of Psychology: Research-based interdisciplinary PhD program in environmental psychology (a subprogram of CUNY's PhD program in psychology). <http://web.gc.cuny.edu/dept/psych/environmental/index.htm>.

Georgia Institute of Technology, College of Architecture: Ph.D. program in Architecture, Culture and Behavior. <http://www.publicarchitecture.gatech.edu/acb/>

University of California-Irvine, School of Social Ecology: PhD program in social ecology. <http://www.seweb.uci.edu>.

University of Sydney, Faculty of Architecture, Design & Planning: Environment, Behaviour, & Society (EBS) research. [http://www.arch.usyd.edu.au/research/env\\_behaviour.shtml](http://www.arch.usyd.edu.au/research/env_behaviour.shtml).

### Professional Organizations

American Psychological Association, Division 34, Population and Environmental Psychology, <http://apa34.cos.ncf.edu>.

American Sociological Association, Environment and Technology Section, <http://www.asanet.org/sections/enviro.html>; Community and Urban Sociology Section, <http://www.asanet.org/sections/commu.html>.

Canadian Psychological Association, Environmental Section, <http://www.cpa.ca/environmental>.

Environment-Behaviour Research Association of China, <http://www.ebra2004.com/home.htm>.

Environmental Design Research Association (EDRA), <http://www.edra.org>.

International Association for Applied Psychology (IAAP), Environmental Psychology Division, <http://www.psy.gu.se/iaap/envpsych.htm>.

International Association for People-Environment Studies (IAPS), <http://www.iaps-association.org>.