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Applying Social Psychology to the Environment

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CHAPTER OUTLINE

"A California student linked to a radical environmentalist group is being held without bail as he faces charges for allegedly firebombing 125 sport utility vehicles [SUVs] last August [2003]. . . . Human life is risked by the nature of these offences," U.S. Magistrate Carolyn Turchin said during a hearing as she decided not to release 23-year-old Billy Cottrell.

The Pasadena, California, man was arrested on March 9, 2004, and accused of damaging or destroying vehicles at car dealerships and homes in the Los Angeles area. The bill for the property damage was an estimated $2.3 million. At the time, Cottrell was a second-year graduate student in physics at the California Institute of Technology, and e-mails from computers at that school had claimed responsibility for the SUV mayhem on behalf of the extremist group Earth Liberation Front. On its website, the Earth Liberation Front called Cottrell "an environmental campaigner."

Federal Bureau of Investigation (FBI) officials said in an affidavit that Cottrell was also involved in a plot to plaster SUVs with 5,000 bumper stickers that read "My SUV Supports Terrorism." Many environmentalists disapprove of SUVs because of their high gas consumption. If convicted, Cottrell could have spent 40 years behind bars. One charge that he faced, using a destructive device during a

violent crime, carries a minimum sentence of 30 years in federal prison ("Suspected SUV Bomber Held Without Bail," 2004). In April 2005, Billy Cottrell was convicted of conspiracy and arson charges and sentenced to eight years in federal prison. In September 2009, his convictions for arson were overturned, but his conspiracy conviction was affirmed. Billy Cottrell was released in August 2011.

One might ask the following questions:

- Why is gas consumption such a contentious issue?
- If SUVs consume so much gas, what interventions can be implemented to discourage people from buying them?
- As more people drive SUVs, does that encourage still more people to purchase them?

"Wherever you go, there you are." This old saying is another way of conveying the idea that no matter what you do—whether you are interacting with others or are alone—and no matter what behavior or thought you are engaged in, you do it *somewhere.* This somewhere is the physical environment, and it is often a crucial influence on our actions, thoughts, and well-being. But our actions, both individually and collectively, also have an enormous impact on the physical environment—sometimes beneficial, but sometimes harmful.

The task of psychologists interested in the environment is to examine a great variety of topics besides the issues involved in extreme actions aimed at defending the natural environment. Environmental psychologists study not only how the physical environment (e.g., buildings, weather, nature, noise, pollution, street arrangements) affects our behavior, thinking, and well-being, but also how our behavior (e.g., energy conservation, vandalism, activism, automobile use, recycling, water use) affects the environment (e.g., climate change, water shortages, pollution, reduced biodiversity).

Many topics examined by environmental psychologists have social aspects, including the following: violence in jails; weather and altruism; the design of the built environment in relation to crime, privacy, crowding, and territoriality; the effects of noise and lighting on interpersonal relations; spatial arrangements in offices and schools; social aspects of managing natural resources; and our role in climate change (Gifford, 2008).

One chapter cannot possibly describe fully the range, activities, and actions of environmental psychologists. A recent textbook (Gifford, 2014) describes more than 3,000 published studies in environmental psychology, and even that represents only a fraction of the field's research literature. However, to give you a taste of environmental psychology, including the contributions of social psychology, this chapter focuses on two major topics that should give you a good sample of the field as a whole.

The first topic is **resource dilemmas**, which are sometimes called *commons dilemmas*. These are situations in which individuals must choose between self-interest (taking or using unsustainable amounts of a natural resource, such as water or fish) and the interests of the community or environment (taking a sustainable share, or less, of the resource). Which social factors do you think might come into play as individuals make these decisions? Given that no one person is likely to be given control of an entire water supply, fishing grounds, or the climate, how might you conduct some research to understand what causes greed or cooperation in these situations?

Second, environmental psychologists work to improve the physical environment. Two ways in which they do so are called social design and defensible space. **Social design** is a process by which any building (e.g., office, school, residence, factory, retail store, prison) may be designed in collaboration with those who will actually use that building so that it is more user-friendly, as opposed to being designed solely by an architect who will never use the building. Outdoor spaces, such as streets and plazas can also be designed either to support human

interaction or to ignore it. What social factors might be important in a process like this? Have you ever worked, gone to school, or visited a building that did not facilitate your work, your purpose for using the building, or your social life? Social design could have helped.

Defensible space represents a way of fighting crime through careful arrangement of the physical aspects of communities, retail buildings, and residences. The way in which a building or community is designed can encourage or discourage burglars, robbers, and vandals. What could those design factors be? How could social psychology be a part of this kind of research?

Like the efforts of other psychologists, the work of those who study environmental issues may be grouped into two complementary branches: experimental and applied. Nearly all of environmental psychology is applied in the broad sense that its efforts are stimulated by the recognition of problems in involving interactions between individuals, on the one hand, and their built or natural settings, on the other hand. Virtually all environmental psychologists hope to contribute in some way to the eventual solution of such problems. Even the most experimental of environmental psychologists hope that the results from their studies will be considered in the design of offices, factories, homes, streetscapes, or parks, or in programs designed to increase how much people engage in such efforts as recycling, energy conservation, and reductions in car use.

Environmental psychologists have learned an enormous amount about person–environment relations during the 50 years the field has formally existed. They know much about social environmental dynamics, such as how typical interpersonal distances change with different situations; which social factors are likely to improve or inhibit pro-environmental attitudes; how interpersonal relations lead to water conservation; how crowding affects social interaction; how noise influences helping behavior; how temperature is related to interpersonal violence; and which messages are more likely to encourage climate positive behaviours. Many environmental psychologists have designed behavioral interventions to change and improve behavior toward the goal of more sustainable, climate-friendly practices.

As discussed in Chapter 1, however, good social scientists also want to understand *why* people act the way they do. Therefore, psychologists who focus on the physical environment have developed interesting theories to help explain things, such as who will cooperate and who will not when resources are scarce, how cultures vary in seeking privacy, the cultural meanings conveyed by building facades, the strategies residents use for dealing with spatial conflicts within their homes, how children learn to find their way around their neighborhoods, and which furniture arrangements encourage social interaction (Gifford, 2014).

Nevertheless, as mentioned earlier, this chapter considers only a small sample of these efforts: resource dilemmas, social design, and defensible space.

Resource Dilemmas

As environmental problems and concerns grow, social scientists must learn more about individual and small group contributions to ecological degradation. As humans who dwell in societies, we extract, refine, use, and dispose of many natural resources. However, societies are composed of individuals, and ultimately people make these choices *as individuals and small groups* in their homes, at work, and during their leisure hours.

The crucial aspect of resource management decisions made by each of us is that they sum in ways that are partly rational, partly irrational, and yet all-important, from person to person, across billions of individuals' actions to large-scale effects on the environment and the climate. Mundane everyday choices to turn on the air conditioning, drive the car a short way instead of walking or riding a bike, or take a 15-minute shower instead of a 5-minute shower add up to resource depletion on a larger scale.

Once the macro-environment is affected (e.g., increased CO_2 in the atmosphere, less forest

cover, depleted aquifers, more landfills, more pavement), it affects us in return. Most of us realize that we should waste less, but we are tempted to lead lives that use many natural resources (e.g., water, oil, wood). Our divided goals lead us to experience this as a dilemma, that is, one or another of a family called social dilemmas.

A Family of Dilemmas

The focus of this section is on resource dilemmas, which represent one of several kinds of dilemma situations that fall under the general category (family) of social dilemmas. **Social dilemmas** are a group of situations in which individuals face important choices. Sometimes individuals do not realize how important their choices are—or even that they are making choices—but that is a separate problem. In social dilemmas, the rewards to the individual for noncooperation are greater than the rewards for cooperation no matter what others do; however, if most individuals involved fail to cooperate, then everyone receives lower rewards (Dawes, 1980). A simple example would be a person washing a car during a dry spell. This person gains a clean car by using scarce water—the reward (a clean car) seems greater than having no reward (an unclean car)—and this clean car reward occurs, in the short term, regardless of what other community residents do. If this person is one of very few people washing their cars, a clean car reward is gained with little loss to the community water supply. However, if many people wash their cars, serious damage might be done to the water supply, and everyone receives a lower reward—having no water, or perhaps muddy water, from the community supply—and this consequence is worse than merely having a dirty car.

Three main forms of social dilemma are recognized: public goods problems, social traps, and resource (or commons) dilemmas. **Public goods problems** involve dilemmas about whether to contribute (e.g., time, effort, money) to a project that would benefit everyone when such a contribution is voluntary. For example, one may decide to help (or not help) build a neighborhood children's playground. The dilemma is that contributing costs something (in this case, one's money or time), but if not enough others contribute, the playground project will not be successful.

A person is tempted to *avoid* contributing to the public good (to not cooperate) for two reasons. First, if enough others contribute their time and/or money so that the public good succeeds, the person benefits (gets a neighborhood playground) without having to contribute anything. Second, contributing is risky in that a person might donate money or time, only to find that not enough others do so; if this happens, the project fails, and the person's contribution is wasted.

Of course, the ideal outcome is that everyone helps and the project succeeds. Unfortunately, some do not help, leaving the outcome uncertain, and then each person begins to wonder whether participation is a good idea—this is precisely the public goods dilemma. Public goods dilemmas are surprisingly common in our lives (just look around with the concept in mind). Unfortunately, many worthwhile projects fail.

Social traps are a second form of social dilemma. They involve short-term pleasure or gain that over time leads to pain or loss (Platt, 1973). Some classic social traps include smoking, overeating, and using pesticides. They are dilemmas because individuals must choose between an immediate reward (e.g., the pleasure of smoking, the pleasure of eating an extra dish of ice cream), and the long-term negative outcome to which the reward can lead (e.g., lung cancer, obesity) versus the choice of short-term deprivation (e.g., quitting smoking, refusing to eat the extra dish of ice cream), and the long-term positive outcome to which the deprivation can lead (e.g., a longer life, a slimmer build).

Two problems create the dilemma in a social trap. First, the long-term outcome usually is not certain (e.g., not every smoker dies of smoking-related disease, nor does every person who abstains from smoking live a long time). In the

case of the environment, the long-term uncertainty makes it easier to rationalize choosing the environmentally damaging option, for example, using excessive water in the spring when the state of the community reservoir later in the summer is not yet known. Second, individuals tend to *discount* (i.e., downplay) the negative outcomes; for example, pesticide users usually do not think about how their pesticide use can lead to ecological problems in the future, or they believe that their own small contribution does not matter all that much.

Public goods problems and social traps are important social dilemmas that clearly are pertinent to the well-being of the physical environment. All of us must deal with these two forms of dilemma in our lives. However, as noted previously, the focus in this chapter is on a third form of social dilemma, the **resource dilemma,** which is sometimes called the commons dilemma, a term first used by Dawes (1973).

What Is a Resource Dilemma?

Early perspectives on resource dilemmas. The car-washing example given earlier is a specific form of resource dilemma. For a more general understanding, let us start with a little background based on an allegory told long ago by William Lloyd. In some older societies, "the commons" referred to a central open space in the heart of a village. By mutual understanding, this commons was jointly owned by all citizens in good standing without any borders or fences inside it. All citizens were allowed to use its grass and open space to graze their animals. The unwritten rule was that each family could have one cow. There was enough grass for all of the citizens' animals, and the commons worked well for many years (Lloyd, 1837/1968).

However, the day eventually came when one citizen decided to make a little extra money by having a second cow, from which more milk could be produced and sold. There is nothing wrong with "getting ahead," is there? (Another possibility is that more families moved to the village, and each family wanted to add one more cow. Everyone is entitled to one cow, right?) The problem is that the amount of available grass remained the same; the alternative was to cut down more of the forest surrounding the village, but that is just another form of resource dilemma. Whether someone wanted to get ahead or the number of shareholders in the commons grew, there was more use of the same amount of grass. As demand for a limited resource increases, the issue becomes one of *freedom in the commons,* according to Garrett Hardin. Do citizens have the right to take what they want (individual freedom to get ahead), or to increase the number of families, all of whom want equal grazing rights, or should there be restrictions so that the commons is protected (Hardin, 1968)?

When the supply of a resource seems large or nearly limitless, individuals seem to feel free to exploit the resource as much as possible. One reason for this was advanced by the famous 18th-century economist Adam Smith (1776/1976), who argued that in exploiting a resource for one's own benefit, an individual allegedly is guided by an "invisible hand" to benefit the whole community. For example, a whaler who becomes rich would employ people, buy equipment, and donate to social, educational, and charitable causes—and would generally aid the economy. At one time, the supply of whales seemed nearly endless.

In telling the preceding village allegory, Lloyd (1837/1968), a 19th-century economist, appears to have been the first to see a fundamental problem with Smith's logic. Lloyd recognized that many resources are, in fact, finite and limited. When that is the case, a big problem arises. In a limited commons consisting of some desirable resource, individuals acting in self-interest might lead to a process called the **tragedy of the commons**, which occurs when "each [person] is locked into a system that compels him to increase his [harvesting] without limit—in a world that is limited. Ruin is the destination toward which all [persons] rush, each pursuing his own best interest" (Hardin, 1968, p. 1244).

The classic example of a commons dilemma is grazing land (as in the commons example), but the extreme importance of resource dilemmas is

that many other resources are limited and essentially held in common—freshwater, forests, habitat, and even our one and only atmosphere. Resource dilemmas are a *matter of life and death for all life on the planet*.

The conclusion to Lloyd's allegory was that once the commons was overused, the grass ran out and so the cows perished, and then the villagers did not have enough to eat and so they too died. Lloyd's story was an amazingly prescient vision of our modern notion of the limited "spaceship earth," given that he first presented the story more than 175 years ago.

The nature of the dilemma itself. What is a resource dilemma? One occurs each time you want to do something that uses a limited natural resource (e.g., freshwater, oil or gas, wild fish) that would make your life easier, more fun, or more comfortable. Some resources regenerate relatively quickly (e.g., grass for grazing, water in reservoirs), others regenerate not so quickly (e.g., fish, trees), and some regenerate very slowly, or not at all (e.g., oil, endangered species). When resources regenerate more slowly than people can harvest them, the danger of resource exhaustion arises. Users of such resources face a choice: either choose to get ahead quickly at the expense of the commons (the resource and/or the environment) and other harvesters, or choose to restrain harvesting to preserve the commons and increase one's contentment or wealth more slowly. The radical environmentalist Billy Cottrell (opening vignette) apparently believed that oil, from which gas is produced, is a natural resource that is being harvested too quickly.

Not all natural resources are in short supply, even those that are created very slowly (e.g., sand). But, when people are able to harvest a desirable resource faster than it can regenerate through improved technology or sheer person power, the potential dilemma becomes an actual dilemma. Harvesters must choose between rapid, resource-destructive, short-term, self-interested harvesting ("get it while you can"), and restrained, long-term, community- and resource-oriented harvesting.

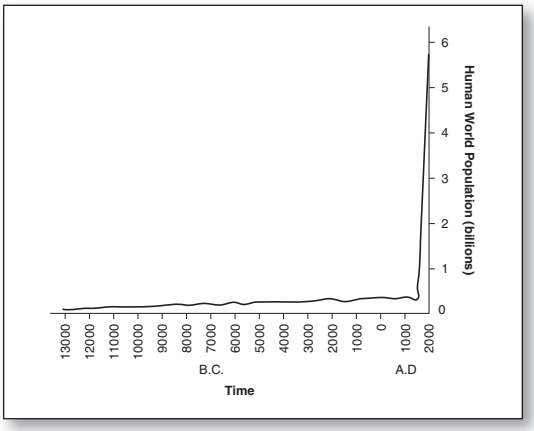
The consequences of resource dilemmas. Hardin's (1968) article in the journal *Science* on the ultimate consequences of resource dilemmas has been very influential. He concluded that commons dilemmas probably would be fatal to the entire planet eventually. In terms of the enormous environmental social problem called climate change, many tendencies to *not* take appropriate action have been identified. These "dragons of inaction" (Gifford, 2011) include over 30 "species" in seven "genera"—limited cognition, certain ideologies, social norms and comparison, discredence (mistrust of experts), perceived risks (of changing one's behavior), sunk costs (e.g., investments in resource extraction), and limited behavior (e.g., "I recycle, so I have done enough").

However, environmental psychologists have not accepted without question Hardin's tragedy of the commons argument that most (too many) individuals will act in their short-term self-interest. They believe that the issue of how individuals will behave in a limited commons is an open question that will be resolved through empirical research. Hardin was a biologist; he had a fairly pessimistic outlook on the future, based on some clear examples of nonhuman animal populations that followed a tragedy of the commons path to destruction. The growth of the earth's human population over the long term certainly resembles the same pattern observed in some animal populations that collapsed after extremely rapid growth. The explosive growth of the population of humans is depicted in Figure 13.1.

Nevertheless, humans have greater cognitive capacity than other animals, and we can anticipate difficulties and solve problems—usually. Can our species do better, or are we just another animal in the sense that we will not be able to escape the tendency to greed that will eventually destroy us? Social scientists have pursued this question and created sizable bodies of work in their attempts to try to answer it (e.g., Gardner, Ostrom, & Walker, 1990; Gifford, 2014, Chapt. 14; Komorita & Parks, 1994).

The case of water: *A dose of reality.* One of the most important resources in the world is

Figure 13.1 The Growth of the Human Population on Earth



freshwater, and it is bound to become more important in the future. You will recall that Lloyd pointed out a flaw in Adam Smith's 18th-century influential economic theory that was based on the assumption that natural resources are essentially unlimited. It was acceptable—even admirable—for entrepreneurs to use them at will to create wealth because others in society also would benefit. This rationale still is used today to justify the "necessary" growth of business and the economy.

We now know well that at least some natural resources are not unlimited and that people have been fighting over limited natural resources for centuries. In his book *Resource Wars,* Michael Klare recalled the biblical accounts of the Israelites' drive from the desert into the "Promised Land," that is, the fertile valleys of the Jordan River basin that contained good supplies of water (Klare, 2001). This drive involved a successful invasion (led by Moses) of these lands that were held by several groups that the Israelites expelled from the fertile region (e.g., Canaanites, Amorites, Hittites).

Klare (2001) argued that the 1967 Arab–Israeli war essentially was a modern repetition of the same struggle. He quoted former Israeli Prime Minister Yitzhak Rabin who once said, "If we solve every other problem in the Middle East, but do not satisfactorily solve the water problem, our region will explode." Ancient and modern Egyptian rulers likewise have struggled to control the waters of the Nile, which during modern times flows through nine countries. Boutros Boutros-Ghali, the former Egyptian minister of state for foreign affairs said, "The next war in our region will be over the waters of the Nile, not politics."

Today's natural resource struggles are over oil, fish, and trees as well as water. The ancient legacy of war and armed conflict in the Jordan and Nile regions could well be repeated as sources of water, fish, oil, and trees recede. Indeed, there have already been many oil wars and fish wars during recent times. Thus, cooperation in the use and management of natural resources is not some kind of academic parlor game; it is of vital importance in the real world of politics and war. Lives depend on finding ways of sharing natural resources in equitable ways.

We all play a part in the management of a steady stream of natural resources (e.g., freshwater, oil, wood, fish) that have been converted into products that we use every day. Some of these resources come from limited sources. Commons dilemmas occur when improved technology or increased person power enables the harvesting of resources faster than the resource can regenerate. A special issue of *National Geographic* (Water: Our Thirsty World, 2010) calls our attention to the impending water crisis with the following observations:

- Less than 3% of the Earth's water is fresh (p. 32). Of that amount about 70% is sealed in ice and snow (p. 46).
- The remaining water primarily is in aquifers that are draining faster than nature can replenish them (p. 52). An aquifer is an underground porous deposit of rock, sediment, or soil that can range in area from a few square miles to thousands of square miles.
- Water tables have declined substantially in regions of the Earth that contain half the human population (p. 49).
- People—mostly women—in developing nations must walk on average 3.7 miles to obtain their water (p. 56).

- As approximately 83 million people are added to the Earth's population each year, demand for water continues to increase (p. 52).
- By 2025, nearly 2 billion people will inhabit areas with sever water shortages (p. 56).

As Barbara Kingsolver, an American novelist wrote in that special issue, "We have been slow to give up on the myth of Earth's infinite generosity. Rather grandly, we have overdrawn our accounts. . . . Water is the ultimate commons" (p. 49).

All of us who use natural resources or products derived from them (i.e., everybody) must decide whether to maximize our own gain in the short term, or instead to help maximize the gain over the long term for everyone, including ourselves (and, in the course of so doing, to preserve the resources themselves rather than wiping them out). The crucial aspect of all these individual decisions is that they add up to society's success or failure in managing natural resources. Take a look at Table 13.1, which shows the *virtual water* for a pound of each of several foods, referring to the total amount of water required to produce the pound. To illustrate, in an industrial system, 816,600 gallons of water are needed to raise a cow or steer for three years from birth to market, that is, 808,400 gallons (for pasture, feed, and hay) + 6,300 gallons (for drinking) + 1,900 gallons (for cleaning stables/farmyards). What do the figures in Table 13.1 suggest in terms of the possible decisions that we as individual residents of our planet might consider making as the water crisis intensifies? Also, a tenable explanation for why countries in the Middle East have not been engaged in outright conflicts over water is that they import large quantities of their food, the production of which relies on the consumption of the water of the exporting countries.

Studying Resource Dilemmas

For environmental psychologists, two important questions are as follows. First, under which conditions will individuals act in self-interest to the detriment of others and the resource? Second, under what conditions will individuals not act in self-interest, and thus act to the benefit of others and the resource? The first question

Table 13.1 Number of Gallons of Water Used in the Production of One Pound of a Food Product (Global Average)

Meat and Animal Products		*Fruits and Vegetables*	
Beef	1,857	Figs	379
Sausage	1,382	Cherries	185
Pork	756	Avocados	154
Processed cheese	589	Corn	109
Chicken	469	Oranges	55
Eggs	400	Beans	43
Fresh cheese	371	Strawberries	33
Yogurt	138	Potatoes	31

SOURCE: Based on data from waterfootprint.org, which appeared in Water: Our Thirsty World [Special Isssue]. (2010, April). National Geographic, 217.

concerns understanding the problem, whereas the second question relates to addressing the problem. Often it is easier or more rewarding, at least in the short run, to engage in self-serving behavior than to behave in the public interest. In a limited commons, the cooperative or public-spirited act often is more expensive, difficult, and/or time-consuming and less immediately rewarding than is the self-serving act. As we will see, social factors are among the most important in answering these questions.

More than 100 recent scientific studies have examined many influences on the choices that individuals and groups make in these resource dilemmas. When you think about it, no government or corporation is likely to give anyone, including a social scientist, complete control over any large real resource merely to conduct an experimental study. Thus, we scientists sometimes use **microworlds**, that is, dynamic computer-based virtual environments that exist in laboratories, but reasonably simulate real-world conditions (DiFonzo, Hantula, & Bordia, 1998). It is tempting to think that participants in these simulated environments do not respond in the same way as they do in everyday life, but there is good evidence that a well-constructed microworld will elicit strong emotions that seem to indicate that the participants are taking the microworld as seriously as they would a full-scale resource.

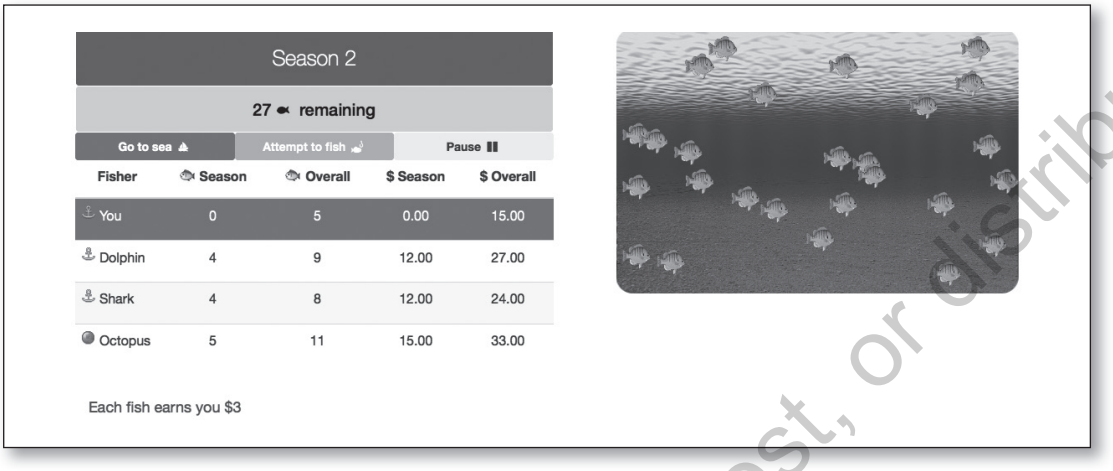
In a typical study, several participants (fishers) might see, in a computer-simulated fishery (i.e., a microworld), that a lake contains 100 fish. They are told that they will receive $5 for each fish they catch, and that they can catch as many as they wish. The fish spawn at the rate of two between seasons, that is, the number of fish left after all the fishers have caught as many fish as they want for a season doubles before the opening of the next season. However, the lake's resources cannot support more than 100 fish, so the spawning can never result in the lake having more than 100 fish. If all the fish are ever taken, they obviously cannot spawn, and the fishery is dead. If you were one of four fishers in this situation, how many fish would you catch in the first season? Do you wonder how many fish the other three fishers might take? Will the four of you manage this resource in a sustainable way so that the fishery continues indefinitely—or will the four of you extinguish the fish population?

Altogether, perhaps 35 different factors have been found to influence whether harvesters tend to be greedy or cooperative in resource dilemmas (Gifford, 2014, Chapt. 14; Komorita & Parks, 1994). In general, these studies have focused on three kinds of influence on cooperation in the commons. The first is the nature of the resource itself (e.g., how much of it is available, how much of it is certain to exist). For example, in the typical study above, what if the lake contained 1,000 fish, or 25 fish, instead of 100? What if, in the case of a real lake, counting the fish is difficult, so scientists must estimate the fish population? Their best estimate is that the lake contains 50–150 fish. How would that affect the fishers' harvesting? A second factor involves the social conditions or rules surrounding the harvesting (e.g., how well the harvesters know and trust each other; whether a leader exists, is elected, or acts in a certain way). What if the four fishers are all good friends, or all strangers? What if the four have a boss, or they know that a game warden is nearby? The third factor is the characteristics of the harvesters themselves (e.g., their values, their needs, or their experience as fishers). What if one of the fishers has four children and another has none, or two fishers are very aware of the concept of sustainability, and two others have never heard of the idea?

Each study typically examines two or three specific variables at a time. As an example, our own research has focused on the thinking processes of participants as the dilemma evolves over time (Hine & Gifford, 1997), and on the attributions made about the actions of the self and other harvesters (Gifford & Hine, 1997; Hine & Gifford, 1996). In part, decision making and behavior in resource dilemmas depend on what we think about the other harvesters and *their* choices.

Typically these studies are done in laboratories, in order to test hypotheses in a scientifically

Figure 13.2 Screen Shot From FISH 5



correct way, but the findings do apply to the real world. Not only fish, but water, trees, many species of animals and plants, and other natural resources are valuable, but in short supply. Clearly, the basic idea of the resource dilemma is tied to the fate of many important resources, and therefore, ultimately, to our own fate.

Let us consider an example of a particular microworld called FISH 5 (Gifford & Gifford, 2000), which re-creates in the laboratory the situation faced by actual fishers as they choose how much of a fish stock to harvest. The program creates a context that includes many of the essential elements of a real resource dilemma. As a participant fisher, you are able to choose, if you wish, to catch fish more quickly than they can spawn. In fact, you can catch all the fish at any time. But if you do that, or another fisher does, the fish will not exist to reproduce in the future, so the quick gain comes at the expense of any future harvests. Therefore, you may also choose to restrain your harvests in the interest of conserving the stock of fish. Each fisher in a fleet (group) has equal and full access to the resource. Thus, one big concern is what the other fishers will do; can they be trusted to restrain their harvests? Figure 13.2 shows a screen shot from FISH 5.

FOCUS ON RESEARCH

Exploring the Thought Processes by Which Fishers Make Harvesting Decisions

Experimental research on resource dilemmas has been very productive and has generated a number of important findings (Komorita & Parks, 1994). Most such studies set up various conditions for their participants and then observe the resulting behaviors. However, more might be learned by examining the "inner" process by which harvesters make their decisions. Grounded theory analysis (Glaser & Strauss, 1967), is an approach that seeks to "get into the heads" of participants, and is useful for this purpose. (Grounded theory analysis was discussed in Chapter 3 as an example of qualitative methods.)

Grounded theory analysis is a sophisticated way of learning how people think about particular issues by asking them what they are doing, and why, as they are considering something like making

a decision about using a resource. It uses the **think-aloud procedure**, in which individuals explain their decisions moment by moment as they make them. This procedure enables the researcher to track online cognitive processing as it naturally occurs. As noted earlier, in most resource dilemma studies, researchers simply impose a set of conditions on the harvesters and then observe their resultant decisions. This tells us little about exactly how the decision makers arrived at their decisions because it ignores what goes on in the "black boxes" of the people's minds.

One resource dilemma study used this grounded theory approach to find out what goes on in harvesters' heads (Hine & Gifford, 1997). In this microworld study of fishing, one real participant (at a time) was seated in front of a personal computer and used a tape recorder to collect his or her thoughts. Two computer-simulated fishers also harvested fish, and their harvesting behavior was programmed to range from quite cooperative to quite greedy. The real fishers were faced with a harvest choice: to take fish for which they receive payment, or to leave the fish in the water to reproduce.

Before the fishers fished, and as they fished, the think-aloud technique was used to gather the fishers' action strategies, heuristics, and cues that triggered their decisions about whether to take fish or not. The results showed that several main *action strategies* were employed by harvesters, including the following:

- Close monitoring of others' harvest practices
- Imagining the future harvests of others
- Trying to avoid overuse of the resource
- Attempting to influence the harvests of others through one's own harvest practices (i.e., strategic harvesting)

Notice that three of these goals were social; they related to what other fishers were doing. This shows that social interaction, whether direct or indirect, is an important part of decisions about whether to use natural resources. Interestingly, two of these social strategies—imagining the future harvests of others and strategic harvesting—had received little or no attention previously in the general experimental research literature. By uncovering them, the study helped to point the way toward a fuller understanding of harvesters' decision making, which in turn leads toward improved policy making in real resource dilemmas. The results suggest that when policy makers consider strategies to encourage conservation of natural resources, they should be aware that people do try to imagine or guess what other harvesters might choose to do (a very social factor), and that people use their own harvests to send messages to others (another very social act). How would you turn this knowledge into concrete policy? Now let us leave the lab to consider some programmatic interventions that have been conducted in the field to address how to cause human behavior related to resource dilemmas to become more environment friendly.

Strategies for Inducing Pro-Environment Behavior

Recognizing that a variety of environmental problems represent threats to environmental sustainability and that many problems have their roots in human behavior, Steg and Vlek (2009) delineate four steps to take in the process of promoting pro-environment behavior change. First, choose a specific behavior to be changed that will improve the quality of the environment. Second, examine the primary factors underlying

this behavior. Third, design and apply an intervention to change the behavior so as to reduce its environmental impact. Fourth, rigorously evaluate the effects of the intervention on the behavior and also on the quality of environmental and human life. Often, the beginning point of this process is to select a particular group for the intervention, as opposed to changing the behavior of "everyone." The above framework proposed by Steg and Vlek corresponds closely with steps outlined for the design and evaluation of interventions in Chapter 4.

With respect to the second step, what are the main factors that underlie pro-environmental behavior (or the lack of it)? They are a complex mix of values, awareness of the problem, environmental attitudes, a sense of control, moral and social norms, guilt, and attributions about self and others (Bamberg & Möser, 2007). All behavior has multiple determinants; even if one or two influences are investigated in a given study, we must be aware that some influences that are *not* examined also influence the behavior.

What sorts of intervention are used? They fall into two main categories: *antecedent strategies* directed at factors that precede the problem behavior (e.g., behavioral commitment, goal setting, information or education, environmental design), and *consequence strategies* directed at the consequences that follow the problem behavior (e.g., feedback, rewards) (Steg & Vlek, 2009). A widely used antecedent strategy involves providing people with pro-environment information, based on what has been called the *information-deficit model*, which assumes that more information will lead to better behavior. Information-based educational strategies tend to result in greater awareness and knowledge levels, but they often do not lead to actual behavior change. The value of educational campaigns lies in their *priming ability*; that is, they get people ready to make a change rather than actually get them to change. However, information can make a difference. For example, some messages are more effective than others. One study (Gifford & Comeau, 2011) found that empowering messages (e.g., "You can do it!") often produce stronger intentions to engage in climate-positive behaviors than sacrifice messages (e.g., "You will have to cut back!").

As noted in the preceding example, the way in which information is presented can make a big difference in how effective it is at influencing people's behavior. Cialdini et al. (2006) examined the effectiveness of different forms of messages on preventing people from stealing petrified wood in Arizona's Petrified Forest National Park, a problem that had become so severe that it landed the park on the list of America's ten most endangered parks.

A prominent sign at the park noted that "the park's existence is threatened because so many past visitors have taken pieces of petrified wood from the ground" (p. 5). You'd think a sign like this would be effective at stopping people from stealing the wood, but such a sign might actually be ineffective because it focuses people's attention on undesirable, but apparently common behavior. Behavior is influenced by norms, which you may recall from Chapter 4 are shared beliefs about behavior. You may also recall from Chapter 9 that descriptive norms refer to what most people do in a certain situation (e.g., most people pick up their litter). Such norms indicate how most people act. Injunctive norms refer to what most people approve or disapprove of (e.g., please don't litter). Such norms indicate what people ought to do. In drawing people's attention to the fact that so many visitors had taken wood, the prominent sign new visitors saw at the park might have actually contributed to the problem by inadvertently highlighting the descriptive norm that "everyone is doing it," so you might as well too!

To study this topic the researchers put signs at the start of three popular paths within the park and placed 20 pieces of petrified wood along the paths. To test the effectiveness of the various signs, after 2-hour blocks of time the researchers counted the number of pieces of wood that had been taken from the paths, replaced the pieces, changed the sign, and started again. The signs contained one of four types of messages: those with injunctive versus descriptive norms, mixed

with negatively worded versus positively worded messages. The reason for the different valenced messages was to test the idea that negatively worded information has a stronger effect on people than positively worded information. The injunctive signs condition contained a plea to preserve the state of the park. In the negatively worded condition it was phrased as "please don't remove the petrified wood from the park" (Cialdini et al., 2006, p. 8), and included a picture of a person stealing a piece of wood with a circle-and-bar image appearing over his hand. In the positively worded condition, the phrase read "please leave petrified wood in the park" and included a picture of a person photographing a piece of wood. The descriptive norm condition contained information about the behavior of many past visitors to the park. In the negatively-worded condition the information was phrased as "many past visitors have removed the petrified wood from the park, changing the state of the Petrified Forest," and included a picture of three people taking some wood. In the positively worded condition, the information was phrased as "the vast majority of visitors have left the petrified wood in the park, preserving the natural state of the Petrified Forest," and included a picture of three people photographing a piece of wood. The researchers hypothesized that the negatively worded injunctive sign would result in the least stealing of wood, whereas the negatively worded descriptive sign would be the worst at curtailing wood theft (because the *in*effectiveness of the descriptive sign would be *intensified* by the negative messaging).

So, what did the researchers find? As predicted, they found that the negatively worded injunctive norm message resulted in the least stealing of petrified wood, and the negatively worded descriptive message resulted in the most stealing of petrified wood. Thus, they found that the prominent sign the park had been using to stop people from taking wood from the forest was, indeed, not as effective as it could be.

As noted by Cialdini et al. (2006), there are numerous examples of public campaigns designed to curtail undesirable behavior that are misguided because they inadvertently include descriptive norms that underscore the popularity of the unwanted behavior. For example, anti-smoking campaigns that highlight the fact that "there are 3000 new smokers every day" underscore normative information about the popularity of smoking, and thus undermine the intended effect of the message. Successfully changing environmental behavior by drawing on norms may require focusing messages on the injunctive variety. You'll find another example of the value of norms on changing environmental behavior in the Focus on Intervention in this chapter.

Among consequence strategies, rewards often encourage energy conservation, but with short-lived effects. Feedback can be useful, especially if it is given frequently (Abrahamse, Steg, Vlek, & Rothengatter, 2005). Let us consider a small sample of studies that employed intervention strategies directed at encouraging three categories of pro-environment behavior: increased recycling, reduced driving, and reduced home energy usage.

Getting people to recycle. Recycling is a less impactful environmental behavior than transportation or household energy use, but it is easier to adopt, and therefore is environmentally valuable. We might first investigate which factors predict recycling as a behavior. A study in England (Nigbur & Uzzell, 2010) examined various factors, including attitudes, intentions, norms, personal control, identification with one's neighborhood, and self-identity (do persons think of themselves as recyclers?). Attitudes, perceived control, self-identity, and norms predicted the intention to recycle, and these intentions in turn predicted behavior.

However, other research shows that the link between attitudes about recycling and recycling behavior may not be as straightforward as originally believed. Most attitude research examines attitudes on a single dimension from positive (e.g., pro-recycling) to negative (e.g., anti-recycling), but this single dimension may not reflect how people actually feel about recycling. Many people hold ambivalent attitudes about recycling. In other

words, they may feel that recycling is important (a positive attitude toward recycling) while simultaneously feeling that recycling is a hassle (a negative attitude). How do ambivalent attitudes toward recycling influence recycling behavior? Ojala (2008) conducted a mixed-methods study to answer this question. You may recall from Chapter 3 that mixed-methods studies involve qualitative and quantitative research methods. Young adults living in Sweden completed a questionnaire measuring their attitudes toward recycling, their recycling behavior, and their worry about the environment. Ojala found that participants who had ambivalent attitudes toward recycling (e.g., they felt that it was important, but also a hassle) were less likely to recycle than those with purely positive attitudes toward recycling.

Although these results are interesting, they don't provide very much detail about the thought processes that people engage in when choosing whether or not to recycle. To find out what motivated people to recycle, Ojala conducted a follow-up qualitative study. In this study, she interviewed 21 participants from the survey study about their recycling attitudes and behaviors. Half of the participants chosen for the interviews were regular recyclers and the other half rarely recycled. The purpose of the study was to gain more in-depth information about the experience of recycling and people's reasons for choosing whether or not to recycle.

Ojala found that the reluctant recyclers (i.e., people who rarely recycled) believed that recycling was important, and that they felt positive emotions when they occasionally recycled, however, the negative aspects of recycling usually outweighed the positive aspects. These negative aspects included viewing recycling as inconvenient, complicated or disgusting, mistrusting that recycling was actually beneficial, and viewing oneself as too lazy to recycle. In contrast, the regular recyclers were conscious of growing environmental problems, but also felt hopeful that recycling could help the environment. These results suggest that one way to increase recycling behavior is to reduce the perceived barriers to recycling, such as inconvenience, disgust, and mistrust, while increasing the perceived benefits of recycling. No wonder encouraging people to recycle is not an easy task!

One way to change people's behaviors, for example to increase their level of recycling, is through a social psychological intervention. The effectiveness of several intervention strategies designed to promote recycling was examined in a California community (Schultz, 1998). The researcher attempted to increase residents' recycling behavior by making norms about their own or others' recycling behavior salient to them, thereby highlighting existing discrepancies between the norm (i.e., "I should be recycling every week"), and a resident's actual level of recycling. During an eight-week baseline period, researchers collected and measured the levels of recycling among 480 households. A week after the baseline, a green door hanger was placed on the doorknob of the front door of every household. A message on the hanger indicated to the residents that the household had been chosen to be part of a recycling study and that they should recycle as much as possible. Some households—in the *plea-only condition*—were not contacted again. On one morning of each of the next four weeks (the intervention period), household recycling materials were collected and measured. For each of the remaining three conditions, door hangers were placed on household doorknobs within 24 hours of the collection of the recycling materials. In the *information condition*, the hangers had printed information (varied from week to week) about the recycling process and materials. Households in the *individual feedback condition* received door hangers that provided feedback about their own level of recycling for the previous week, for the current week, and for the course of the study. Households in the *group feedback condition* received information about the level of recycling in the entire neighborhood for the current week, previous week, and course of the study. Levels of recycling also were measured during the four weeks following the intervention period.

Based on theory and evidence regarding the effects of activating norms by providing

feedback, Schultz (1998) predicted that feedback of either kind (individual or group) would be more effective in promoting recycling than would either merely providing information or simply making a plea to recycle. The research prediction was supported by the results. During the intervention period and the following four-week period, both the households receiving the individual feedback and those receiving the group feedback significantly increased their amounts of recycling relative to the baseline period. Neither the plea-only condition nor the information condition displayed significant increases.

Schultz's (1998) experimental intervention was by no means a simple field study. Imagine the amount of time and money required to carry out the project. The two norm-based interventions worked, but were they too costly? Schultz took his research a step further by conducting a cost–benefit analysis. He calculated the labor and material costs involved in planning and implementing the intervention, and the short-term financial benefits (e.g., monies received for recycling materials, reduction in funds needed to pay for trash disposal). Schultz determined that if the interventions were implemented on a city-wide basis, the yearly financial gains would exceed the implementation costs of either the individual or the group feedback intervention strategy. He further noted that very important environmental benefits (e.g., conservation of resources, reduced pollution) had not been factored into the benefits of the interventions, but clearly add to their value.

Getting people to drive less. One experimental study designed to get people to drive less involved an online intervention directed at reducing driving in college students (Graham, Koo, & Wilson, 2011). The research was designed and carried out in the context of concern about the pollution caused by the over 240 million registered vehicles in the United States, and the fact that the United States is the world's biggest consumer of energy (although China now uses almost the same amount), of which a substantial proportion is due to the operation of automobiles. Every second day for two weeks, the participants visited a webpage and reported the number of miles they had *avoided* driving (e.g., instead of driving they took a bike, walked, used public transportation). After each session, if participants reported they had avoided using their cars, they received the following feedback depending on the condition: (a) *pollution avoided condition* (i.e., pounds of carbon dioxide, carbon monoxide, hydrocarbons, and nitrogen oxide); (b) *financial gains condition* (i.e., savings on gas and maintenance); (c) *both pollution avoided and financial gains condition*; and (d) *no feedback condition*. The pollution avoided feedback and financial gains feedback were used to connect the decision to drive less to specific goals, a prosocial one—help the environment—in the case of the former, and a personal one—save money—in the case of the latter. There also was a *no-web control condition*; members of this group did not participate in the online phase of the study. Two weeks afterward, students completed an e-mail survey about their driving habits that included a rating scale on which they indicated how much they had used their car during the previous two weeks.

The results showed that students who were in the four conditions in which they reported instances of avoided driving indicated that they had used their cars less than the students in the no-web control group. This result suggests that the process of keeping track of one's driving, independent of the feedback received, served as an effective intervention strategy. As pointed out by the researchers, the finding is consistent with a number of other investigations that have shown the simple act of record keeping alone is effective in reducing the incidence of a variety of undesirable behaviors (e.g., alcohol and drug usage, driving under the influence). In addition, the students in the combined feedback condition reported driving less than those in all of the other conditions. Adding weight to that finding, the students in the combined feedback condition also reported avoiding more miles over the two-week period (mean = 85) than did the students in the

monetary feedback, pollution feedback, and no feedback conditions (means 49, 48, and 34, respectively). The researchers concluded their study showed promise of using a cost-efficient means of getting people to drive less, and that the provision of combined prosocial and personal feedback may be effective in overcoming the strong reluctance that many people have about reducing their driving.

Getting people to reduce household energy usage. A third major environmental issue is household energy use, which is a major contributor to the steady increases in greenhouse gas emissions. In 2008, households accounted for about 21% of U.S. carbon dioxide emissions (U.S. Department of Energy, 2009). Therefore, effective interventions aimed at lowering household energy usage can help to ameliorate the negative impact of household energy use on the environment. The Internet has been used as an intervention tool to encourage consumers to use less energy. It was used by Abrahamse, Steg, Vlek, and Rothengatter (2007) in the Netherlands to encourage households to reduce their use of direct energy (gas, electricity, and fuel) and indirect energy (that which is used to produce, transport, and dispose of consumer goods). A combination of three intervention strategies was employed: (a) a list of energy-saving measures with potential savings tailored to each household, (b) a goal-setting request to reduce energy consumption by 5% over five months, and (c) customized feedback about changes in energy use and amount of money saved. The 5% goal was achieved. Households consumed 5.1% less energy, whereas a control group had a slight increase in energy consumption.

FOCUS ON INTERVENTION

Using Normative Messages to Increase Home Energy Conservation

Schultz, Nolan, Cialdini, Goldstein, and Griskevicius (2007) conducted a study of the effect of normative messages in promoting home energy conservation. As the researchers note, there has been a "surge of programs" based on the delivery of normative information to affect changes in behavior related to a variety of social problems (e.g., gambling, drug use, eating disorders, littering). Recall that Chapter 4 reviews social norm–based interventions regarding alcohol consumption on college campuses. The rationale underlying these programs is that many individuals overestimate the prevalence of the target behavior (e.g., believe more people abuse drugs than is actually the case), and they will engage in less of the undesirable behavior once their misperceptions are corrected when provided with information about the actual prevalence. This approach, therefore, relies on the influence of a **descriptive norm** as the actual level of occurrence of the behavior is described. The social norm strategy makes good sense as it draws on the powerful effects that norms have on behavior.

As Schultz and colleagues (2007) point out, whereas many of the social norm–based programs have been successful in accomplishing an overall reduction in undesirable targeted behaviors, other programs have produced only slight reductions in undesirable behavior, and some have produced no behavior change or even increases in the undesirable behavior. Schultz and colleagues reasoned that the occurrence of unintended *boomerang effects* may account for some of the disappointing results. They suggested that the normative information provided might act as a

"magnet" for people who engage in more of the undesirable behavior than the norm, *and* also for those who engage in less of the undesirable behavior than the norm. Thus, in shifting their behavior toward greater conformity with the norm, the former individuals will show reductions in the undesirable behavior, whereas, contrary to the objectives of the intervention, the latter individuals will show increases in the undesirable behavior (i.e., the boomerang effect). Needless to say, such increases can undermine program effectiveness. Schultz and colleagues suggested the possible importance of a second type of norm, an **injunctive norm**, that is, a norm that communicates/defines what is the culturally appropriate and approved behavior. The researchers hypothesized that introducing an injunctive normative message along with a descriptive normative message will prevent the occurrence of a boomerang effect. That is, individuals whose levels of undesirable behavior are already relatively low will be made aware of this fact (by the descriptive norm), but will be less tempted to shift toward the norm because at the same time they will receive a message that approves of their current behavior.

The experimental intervention included 290 households with visible electricity meters. First the researchers took a two-week baseline measure of daily household energy usage. After another two weeks, energy usage was measured again, and door hangers were left on the residents' doors with messages written on them. After another week, energy usage was measured again, and door hangers with messages were left. Three weeks later, energy usage was measured for the last time. In the *descriptive-norm-only condition*, the message indicated the amount of energy (in kilowatt-hours) the household had consumed since the previous reading and descriptive normative information about the actual average consumption of the neighborhood households. In the *descriptive-plus-injunctive-information condition*, the message was the same except the researcher drew a "smiley" face (☺) if the household had consumed less than the average, and a "frowney" face (☹) if the household had consumed more than the average. The valence of the face represented the injunctive norm of approval or disapproval. Households in both conditions also received materials reviewing ways to conserve on energy.

The results were the same whether changes in electricity usage were calculated from one week to the next or across a longer, three-week period. For households in the descriptive-norm-only condition, those who consumed more than average prior to the feedback showed a reduction in electricity consumption, suggesting the constructive influence of descriptive norms. However, the change was in the opposite direction for the households that had been below the average. They showed an increase in electricity consumption, suggesting that descriptive normative feedback can indeed subvert the objectives of a program by producing a boomerang effect. On the other hand, as hypothesized by Schultz and colleagues (2007), the addition of an injunctive normative message eliminated the boomerang effect; no increase in electricity usage occurred in households that initially had been below average in usage. Moreover, the injunctive message had no discernable effect on the above-average-consuming household, which showed a decline in usage, as was the case in the *descriptive-message-only condition*. Assuming replication of the role of injunctive messages, the findings clearly have the potential to help account for the mixed results of many social norm–based interventions and the potential to help design interventions that will reduce the occurrence of boomerang effects and accordingly become more effective in achieving their goals of reducing levels of undesirable behavior.

Environmental audits are another approach to home energy conservation. Energy utility companies and governments have tried to provoke conservation through programs in which a company representative visits a household and examines its energy-wasting capacity. Typically, the auditor points out problems, suggests repairs, offers an attractive grant or loan for major refits, and suggests reputable contractors for doing the needed work. The success of such programs has been variable. For instance, Gonzales, Aronson, and Costanzo (1988) reported that the U.S. national average was approximately 15% of household residents going on to make at least some of the necessary changes to their residences.

The environmental audit program, which on the surface might not seem to have anything to do with social psychology, actually does. Gonzales and colleagues (1988) improved the 15% success rate by training auditors how to communicate more effectively with household residents. Drawing on several established social psychological techniques of persuasion, they instructed auditors to use *vivid examples,* for example, "If you were to add up all the cracks under these doors, it's the same as if you had a hole the size of a basketball in your wall." Also, they told the auditors to *focus on loss rather than gain,* for example, "If you don't fix cracks, it's your hard-earned cash going right out the window." The auditors also were trained to induce residents to invest in the audit process by getting them to follow the auditors around the house, help take measurements, and actually look at the cracks. The researchers reasoned that household residents who personally took part in locating cracks in their homes, and realized that they were playing a role in wasting energy would experience *cognitive dissonance.* They predicted that the residents would be motivated to increase their energy conservation behavior (e.g., fill the cracks) so as to reduce dissonance. Together, the changes to the auditors' social influence strategy produced a cooperation rate of approximately 60%, roughly four times the usual rate and a truly impressive outcome. Imagine the overall impact that the improved communication and persuasion processes could have if that fourfold improvement were applied to residences on a large-scale basis.

In conclusion, Hardin (1968), whose famous article in *Science Magazine* (a peer-reviewed academic journal of the American Association for the Advancement of Science and one of the world's top academic journals) stimulated monumental modern debate and study on resource dilemmas, was not optimistic that humans can avoid the tragedy of the commons, that is, the complete collapse of our resources, and therefore life as we know it. However, environmental and social psychologists have not accepted without question Hardin's argument that individuals will always act in their short-term self-interest. They consider the issue of how individuals behave in a limited commons to be an open question that will be resolved through empirical research, including implementing and evaluating interventions designed to induce people to put aside self-interest so as to preserve scarce and essential resources before they are destroyed. The material covered in this section has suggested that interventions that draw on social psychological theory and evidence show promise with respect to helping to counter Hardin's very pessimistic position.

The Built Environment

Many aspects of the physical environment have been shown to influence behavior, including lighting, noise, and temperature. This section considers the behavioral effects of the physical design and layout of buildings and neighborhoods. Have you ever had to study, live, or work in a school, home, or workplace that just did not work well and did not foster the types of intended behavior? Certainly, some parts of the built environment need much improvement. One well-known example is a large apartment complex in St. Louis, Missouri, that was completed in 1954. The Pruitt–Igoe project was designed with the admirable intention of replacing deteriorating inner-city housing. The design for this complex, which contained 43 eleven-story buildings to

house 12,000 people, was praised in an architectural journal for having vandal-resistant features, individualistic design, and no wasted space (Slum Surgery in St. Louis, 1951).

The Pruitt–Igoe design saved space in part by having elevators stop only at every third floor so that most residents would walk up or down one flight of stairs to their apartments. Pruitt–Igoe cost much less per unit than did comparable buildings. The design changes were considered so admirable that the architect even applied for a patent on the design.

But, problems appeared soon after Pruitt–Igoe opened. The failure to carefully examine its design in relation to human social behavior contributed to high rates of fear, vandalism, serious crime, and vacancy. A particular problem was crime in the stairwells that residents were forced to use caused by the "innovative" elevator savings plan. The situation was so bad that after only 18 years, the city began to demolish the entire complex. In this example, insufficient consideration of how the physical structure would influence social behavior led to the ultimate failure of the project. Whether the architect ever received his patent is unknown.

Pruitt–Igoe is the most dramatic example of building design failure, but many other buildings also pose problems for their users. Take a look at Figure 13.3 for a different example of architecture that fails to suit human needs. *Hard architecture*, as it is called, is aimed at preventing vandalism, but these benches go so far toward that goal that they are uncomfortable, and therefore rarely used.

Social Design

More humane buildings can be designed. The process for doing so, developed over the past four decades, is called social design (Sommer, 1972, 1983). In general, it involves studying how

Figure 13.3 Hard Benches

settings can best serve human desires and requirements. Social design must be distinguished from **technical design**, that is, the engineering aspects of the building like the performance of building materials. Robert Sommer, a social design pioneer, characterized social design as follows:

> **Social design** is working with people rather than for them; involving people in the planning and management of the spaces around them; educating them to use the environment wisely and creatively to achieve a harmonious balance between the social, physical, and natural environment; to develop an awareness of beauty, a sense of responsibility, to the earth's environment and to other living creatures; to generate, compile, and make available information about the effects of human activities on the biotic and physical environment, including the effects of the built environment on human beings. Social designers cannot achieve these objectives working by themselves. The goals can be realized only within the structures of larger organizations, which include the people for whom a project is planned. (Sommer, 1983, p. 7)

Social design also may be distinguished from formal design, which is the traditional approach (Sommer, 1983). **Formal design** favors an approach that may be described as large scale, corporate, high cost, exclusive, authoritarian, tending to high-tech solutions, and concerned with style, ornament, the paying client, and a national or international focus. In contrast, social design favors an approach that may be described as small scale, human oriented, low cost, inclusive, democratic, tending to appropriate technology, and concerned with meaning and context, the occupant or paying client, and a local focus. Although large building projects lend themselves more naturally to formal design, social design approaches certainly can be employed on an area-by-area approach within a large project. These two approaches to design lead to the construction of buildings that differ dramatically, with important implications for human behavior and welfare inside them.

A growing collaboration. Design education and design competitions often encourage designers to emphasize the aesthetic dimension of architecture at the expense of the setting's functional value. Environments should, of course, be both beautiful and functional for their occupants. Unfortunately, attempts to create fashionable works of art dominated architecture for a long time—and still do. Architectural magazines still use expensive photography and glossy paper to show off buildings, but often no people are even visible in the scenes.

It is tempting to conclude that these "unpeopled buildingscapes" accurately reflect many designers' interests. One of the most influential architects in the world, Philip Johnson, said, "The job of the architect is to create beautiful buildings. That's all" (quoted in Sommer, 1983, p. 4). Where in this view is consideration of the residents' social lives and interpersonal relations? Who will live, work, and learn in the building—the architect or people like you?

But, times are changing. Many architects and designers now recognize the importance of designing for the human use of buildings (without sacrificing technological or aesthetic considerations). For example, decades ago the American Institute of Architects sponsored a conference that served as an early summit meeting between social scientists and designers (Conway, 1973). This conference outlined several key roles that social scientist consultants might play, including evaluating building habitability, defining the psychological needs of occupants, and training occupants in the optimal use of buildings.

Even now, many architects are still mesmerized by the aesthetic properties of geometric space, and mainstream psychology largely neglects the physical context of behavior. However, when architects and social designers do collaborate, they begin to think of architecture as **placemaking**, that is, real people imagined in real spaces (Schneekloth & Shibley, 1993). To "make a place," architects and social designers work together to create an "envelope for behavior," meaning that they think mainly

about what people actually do in a building rather than think of the building mainly as a sculptural object without much regard for the people who will be using it.

An example of social design may be offered (Gifford & Martin, 1991). A building that served people with multiple sclerosis (MS) was to be renovated. The social designers interviewed 80 MS patients, their families (who also used the building as visitors), caregivers, and building staff. This resulted in dozens of design recommendations that never would have been incorporated in the renovations had the people who used the building every day not been interviewed. Many of the recommendations were included in the renovation, and an evaluation of the building months later showed that it was greatly appreciated for the way it reduced physical pain for the people with MS and made their use of the building much more convenient and comfortable. The same approach can be used for any group of people, in offices, industrial work sites, public buildings, and even residences.

The social versus formal design dispute need not be adversarial. If formal designers try to make beautiful buildings for the multisensory pleasure of the building's *users,* aesthetic pursuits serve at least part of the social designer's goals (Stamps, 1989). Beautiful buildings may improve our perceptions of each other, facilitate social interaction, and assist occupants in some less direct ways, such as enhancing tourism or a city's reputation.

When and how social design helps. Social design is not *always* needed in the design process. It is not required, for example, in times, places, and cultures where buildings are constructed by small communities in which everyone works together in accordance with a time-tested architectural tradition. These traditions, called **preindustrial vernacular** (Rapoport, 1969), evolved an architecture that already quite well fits community and cultural norms, individual interests, local climate, geography, and building materials. When

Figure 13.4 Vernacular Architecture

community members are both builders and occupants, the design process does not need separate financiers, architects, boards of directors, and construction firms (for an example of vernacular architecture, see Figure 13.4).

In the developed nations of the world, division of labor has produced material benefits for all of us. However, in the design professions (as in other occupations), it has produced considerable role specialization. Because the work of designing and constructing buildings is split more narrowly and each person's entire career is reduced to just one phase of it, communication among the *principal players* in the process tends to diminish. The principal players in building design include the client (who puts up the money), the designer (architect and/or planner), the engineer (on large projects), and (most important) the everyday building user (resident, customer, worker, student, or visitor).

Therefore, social design research has become necessary in industrial and postindustrial societies. Two of its major roles are to both reestablish and facilitate communication among the principal players in the design process. A third role is to remind everyone involved that the everyday building user is one of the principal players.

After the rise of industrialism and before the advent of environmental psychology, the building user was nearly forgotten in architecture. The dazzling technology produced by the industrial revolution provided a vast array of design possibilities—in building materials, construction principles, and international communication among designers. Today, the design of some buildings requires so much attention to technical factors that the future occupants are completely forgotten.

Six goals of social design. Social design researchers and practitioners have six main goals, some are broader than others, and some overlap with others (Steele, 1973):

1. Create physical settings that match the needs and activities of their occupants. *This goal is probably the most important one of all.*
2. Satisfy building users. Occupant satisfaction is important because occupants must spend significant parts of their lives working, residing, or relaxing in the setting.
3. Change behavior. Such changes might include increasing office worker productivity, enhancing social ties among institutionalized elderly people, reducing aggression in a prison, or increasing communication among managers in an administrative office. As we will see, the behavior change goal can be both difficult to attain and controversial.
4. Enhance the building users' personal control (Holahan, 1983). The more building users are able to alter the setting to make it suit their needs, the less stressful that setting will be.
5. Facilitate social support (Holahan, 1983). Designs that encourage cooperation, assistance, and support are desirable primarily for building occupants who are disadvantaged in one way or another, but also for active and successful individuals.
6. Employ "imageability." This refers to the ability of the building to help occupants, and (especially) visitors and newcomers, to find their way around without getting lost or confused.

Let us examine each of these goals more closely by considering the design of buildings.

Matching. How well the occupants' activities and needs are met by the setting is called **matching**. An example of poor matching might be a gymnasium when it is used for a concert. It is done, but gyms are not very well suited to that task. Ideally, of course, buildings should match their occupants' needs and behaviors perfectly. However, whether the degree of match is high or low sometimes depends in part on whose viewpoint is considered (Michelson, 1976). For some, the gym might seem to be a fine place to stage a concert, but for concertgoers and bands, the acoustics and general aesthetics will often be quite inappropriate for a great musical experience.

The early personality theorist Henry Murray and his collaborators distinguished between two forms of **press**, which refers to properties or

characteristics of environmental features that shape behavior (Murray, 1938). **Alpha press** refers to actual reality that can be assessed through objective inquiry. **Beta press** refers to people's interpretation of external reality. For example, a person may act toward a conversation partner in an objectively neutral fashion (alpha press), but be perceived by the partner as aggressive (beta press).

Alpha matching, or **congruence**, refers to how well the setting fits the person from an objective point of view. For example, there is a good (objective) height for kitchen counters for persons of different heights. Beta matching, or **habitability**, is "environmental quality as perceived by occupants of buildings or facilities" (Preiser & Taylor, 1983, p. 6). Some kitchen workers might not think that a certain counter height is good for them, even if experts claim that the existing counter height is correct.

Of course, all of the principal players in the design process hope that both perceived and actual matches are good. The possibility remains, however, that a team of design experts could *declare* that matching has been achieved when the occupants believe that it has not. Unfortunately, significant disagreements between experts and users have indeed been demonstrated in several studies of residential environments. For example, one study found that professional planners believed that a high-quality neighborhood was related to how open, interesting, and pleasant it was, whereas neighborhood residents believed that high quality was related solely to how pleasant it was (Lansing & Marans, 1969). Such clashes mean that efforts must be made not only toward improving the fit between users and their environments, but also toward reducing differences between designer and occupant definitions of good design.

When alpha and beta matching are the same, such as when a building user has an objective need on which everyone agrees, the design implications are clear, but the design still does not always meet this need. For example, persons with physical disabilities often have obvious clear-cut needs like smooth ramps for those in wheelchairs. Yet, many buildings still lack ramps even though they are used by people in wheelchairs.

Nevertheless, building design guidelines for individuals with specific characteristics are a good idea, and many lists of guidelines have been prepared. For example, some designers have considered the proper design for relatively able-bodied older people (Hunt, 1991). Children's day care centers are another setting that has been the focus of many design recommendations(Kennedy, 1991).

Satisfaction. Habitability (beta matching) corresponds to occupant satisfaction, the second goal of social design. Congruence (alpha matching) is the expert's opinion that the occupants are satisfied. But, principal players other than the occupants may or may not be satisfied with the project. Some architects, for example, hope that their buildings will work as statements of certain aesthetic design principles. The paying client (the building's developer) might be primarily satisfied if the project is completed within its budget. Most social designers would be happy if their work contributed to a habitable structure. Occupant satisfaction is usually the goal of social design practitioners and other principal players who are particularly sympathetic to the needs of the building users. Some social designers see the process as part of a worldwide concern for human rights; social design began with attempts to provide the benefits of design to the unfortunate (e.g., mental patients), and to the poor (Sommer, 1983). This activist tradition still fuels the efforts of many social designers.

Change behavior. Many projects implicitly or explicitly embody people's hope that occupant behavior will change for the better. When all principal players, including occupants agree that a certain pattern of behavior needs encouragement or discouragement from the design, the design process may steam merrily ahead. In a New York psychiatric hospital, the violent behavior of some severely regressed psychotic patients was one target when renovation designs were considered

(Christenfeld, Wagner, Pastva, & Acrish, 1989). The new design, which basically made the surroundings more homelike, with shaded lighting, lowered ceilings, and pleasant wall coverings, significantly reduced the incidence of violence. In another study, museum visitors paid more attention to exhibits after careful design changes that increased the visitors' sense of immersion in the exhibit by making the exhibits more dynamic, multisensory, and interactive (Harvey, Loomis, Bell, & Marino, 1998). Sometimes rather simple design modifications can change behavior. For instance, by merely adding tabletop partitions between pairs of students with profound developmental disabilities, researchers increased the amount of on-task behavior of the students (Hooper & Reid, 1985).

Unfortunately, principal players sometimes disagree about who should change which behaviors. Clients who pay for new or renovated workplaces, for example, often expect that the new designs will increase employee productivity. When faced with this expectation, the social researcher is in the uncomfortable position of being asked to use the environment to squeeze productivity out of employees. The very thought of attempting to manipulate employees for the benefit of an organization is unpleasant for many social design practitioners. (Recall the discussion in Chapter 1 of the role of personal values in applied psychology.)

Let us consider an example of how social design can influence performance and behavior in the college classroom. In 1980, Robert Sommer and Helge Olsen redesigned a plain, 30-seat college classroom. With a very small budget, they changed it into a *soft classroom* with semicircular, cushion-covered bench seating, adjustable lighting, a small carpet, and some mobiles. Compared with traditional classrooms of similar size, student participation increased markedly in the classroom. The number of statements per student tripled, and the percentage of students who spoke in class doubled. Students using the soft room wrote many glowing comments about it in a logbook placed in the classroom. The room was still producing more student participation 17 years later (Wong, Sommer, & Cook, 1992). The research of Sommer and his associates, and others (e.g., Wollin & Montagne, 1981) suggests that college classrooms need not be plain and hard; inexpensive changes to make them more pleasant can have very tangible benefits, including better grades, better discussions, and occupant satisfaction (habitability).

Personal control. Good social design will provide building occupants with real options to control their proximate environment. What does this mean in specific terms? Consider, for example, publicly funded residential space for students (dormitories), and poor people (housing projects). Some buildings, high-rises in particular, seem designed to overload residents with social stimulation. Too few elevators and long, narrow hallways, for example, result in the sense that people are everywhere and inescapable. Residents may develop the feeling that they cannot control the number of social contacts—especially unwanted social contacts—they must face daily. This loss of control can negatively affect feelings of security and self-esteem.

Two other common examples of low-control settings are crowded retail stores and traffic jams. **Crowding** refers to the subjective sense that too many people are around; it may be distinguished from **population density**, which is an objective measure of persons per unit area. High density does not always lead to crowding, and crowding is not always the result of high density. Crowding is caused, in part, by social overload and informational overload, which in turn lead to the sense that one has lost control. Designing *against* crowding is in part designing *for* personal control. Again, simple design changes can be effective. By merely adding a few entrances to a mental health center, clients' sense of freedom (and thus control) was increased. Furthermore, the various treatment units within the center experienced a greater sense of identity because therapists felt as though they had their "own" entrances (Gutkowski, Ginath, & Guttman, 1992).

Stress is often related to lack of personal control over physical and social input. Noise, unwanted social contact, congestion, and a lack of places of refuge are examples of primary sources of stress (Evans & McCoy, 1998). Good social design can anticipate and attempt to overcome such sources, or at least buffer the user from them.

Social support. Personal control is an individual phenomenon, whereas social support is a group phenomenon. **Social support** is a process in which a person receives caring, kind words, and helpfulness from those around him or her. Many social problems would be eased if more and better social support were available. Common psychological problems, such as depression and anxiety have been shown to increase when social support is absent or inadequate. Social support may be seen as an antistress process (Moos, 1981).

What can social design do to facilitate social support? On a small scale, furniture can be arranged in a sociopetal fashion instead of a sociofugal fashion. **Sociopetal arrangements** are those that encourage social interaction (e.g., when people sit facing each other), whereas **sociofugal arrangements** discourage social interaction (e.g., when people sit in rows or even facing away from one another; Mehrabian & Diamond, 1971). At the building level, open-space areas may be arranged to facilitate social interaction (Holahan, 1972). Of course, if the personal control goal as well as the social support goal is to be met, the increased social interaction must be controllable; occupants should be able to find social interaction when and if they want it, but should not be faced with unwanted social encounters.

In office buildings, social support may be fostered through the provision of high-quality lounge space for employees. The mere existence of such space does not guarantee that valuable social support will be available, but with inadequate space for employees to share coffee and conversation, the likelihood of supportive social networks declines.

Finally, in some cases, social support may result from a design that provides optimal privacy (being able to filter one's interactions). Consider shelters for victims of domestic violence. A study of alternative designs for such shelters showed that designs characterized by anonymity and safety were most preferred (Refuerzo & Verderber, 1990). Sometimes social support is maximized when a person simultaneously can be near a helper and far from an abuser. The difference in helpfulness and caring is especially large when the contrast is between a residence that is full of hostility and violence, and one that is dominated by caring and understanding.

Imageability. Buildings should be **imageable** (i.e., clearly understandable or legible) to the people who use them (Hunt, 1985). When you walk into a building, you should immediately be able to find your way around, or in more technical terms be capable of *purposeful mobility*. In simple terms, you should not be confused.

Too often, a person enters a building that is unfamiliar and is unable to figure out where to go next. Unless we realize that buildings should be imageable, there is a tendency to blame ourselves (e.g., "I never did have a good sense of direction"). Sometimes observation reveals that you are not the first to have problems. Perhaps you have seen handmade signs that occupants have made to be helpful and/or to save themselves from answering the same question about where such-and-such is "for the hundredth time." Such signs represent a failure to make the building imageable, either through good signage, or through good and legible design of the building itself.

To conclude this section on building design, social design is architectural design that begins with the principle that the needs and preferences of those who will be working, living, or otherwise using a building are important or even paramount. If a building can also be beautiful, that is a wonderful bonus because people do also need beauty in their lives. By virtue of its effects on the way in which people feel and interact, social design is intimately related to applied

social psychology. Slowly, for the past 40 years, social design has increasingly become the goal of most architects. However, goals and reality are not always compatible, and not all new buildings are models of successful social design.

Outdoor spaces. Many of the same social design ideas apply to outdoor public areas, such as plazas, parks, and streets. In one of the most widely used changes wrought by environmental psychology principles, the very fabric of many cities has been changed by a concept called *density bemusing,* which can be traced to the pioneering work of William Whyte (1980). Recognizing the need for some open space in the city core in 1961, the City of New York offered developers a deal: For every square foot of plaza they included in a new project, their new building could exceed normal zoning restrictions by 10 square feet. Developers liked the idea, and this deal certainly increased New York City's supply of open space downtown.

Unfortunately, the new plazas tended to be vast empty spaces, with the developers doing the least possible work to obtain their bonuses. Consequently, New York City revised its offers to developers. It would allow extra floors in new buildings only if developers offered plazas that included many of the amenities identified by Whyte (1980) that are associated with greater use and enjoyment of plazas, such as "sittable space," water (fountains and pools), trees, and accessible food outlets. New plazas based on Whyte's ideas represent marked improvements over the alternatives; that is cities with "canyons," but no open space, or empty concrete spaces. The new plazas have increased the pleasantness not only of New York City, but also of many cities around the world.

A worthwhile exercise is to return to the six goals of social design and consider the extent to which they (some more than others) are served by the implementation of Whyte's thinking. Consider the same exercise with respect to the contributions of Brower (1988), which are reviewed in the following paragraphs.

Sidney Brower has spent years developing and testing ideas for enlivening urban neighborhoods in Baltimore. Two of his key guidelines that have been used to improve the quality of life on the residential streets of that city are (a) keeping the street front alive by encouraging residents to walk, stroll, and play on the sidewalks, and (b) finding a legitimate use for every public space so that people routinely visit all areas of the neighborhood and there are no "dead" or unowned spaces. Once some residents are outside and using the public space, others will feel safe in doing so; security and socializing go hand in hand.

Brower has encouraged more use of the street front by giving residents things to do and places to be. For some, this might mean benches; for others, it might mean horseshoes, hopscotch, bocce, street vendors, or library vans. Recreation on public streets can be encouraged by blocking off streets, alleys, and parking lots to cars. Some areas, such as sidewalks themselves, must be free of fast and rough play by young people so that older people can enjoy walking or watching. At the same time, young people need open space that *can* be used for fast and rough play.

Brower also has reduced the speed and number of cars with speed bumps or temporary barricades. These interventions reduced accidents by up to 30%, and accidents with injuries by roughly 25%. Residents tend to accept the barriers because they feel safer and the neighborhood is quieter and more suitable for walking (Vis, Dijkstra, & Slop, 1992; Zaidel, Hakkert, & Pistiner, 1992).

Defensible Space

As noted previously, in Baltimore, the use of speed bumps and barriers has helped to promote feelings of safety among residents of neighborhoods. How might the physical setting influence the actual likelihood of crime? Most evidence bearing on this question has emerged from the observations and ideas of Jane Jacobs and Oscar Newman that led to **defensible space theory**, which deals with both crime and the fear of

crime (Jacobs, 1961; Newman, 1972). This theory proposes that certain design features will increase residents' sense of security and decrease crime in the territory. Some of the features include the use of real or symbolic barriers to separate public territory from private territory, and the provision of opportunities for territory owners to observe suspicious activity in their spaces (surveillance).

Quite a number of field studies have tested defensible space theory, and most of them provide support for it (Schneekloth & Shibley, 1993). For example, one would expect more crime in areas that offer fewer opportunities for surveillance, and do not appear to be controlled by anyone. A study of crime in university residence halls showed that halls with defensible space features (e.g., more areas over which residents could feel some control and exercise more "surveillability") suffered less crime than did halls on the same campus without such features (Sommer, 1987). A survey of 16 well-conducted studies in which multiple design changes were made in accordance with defensible space theory found reductions in robberies of 30% to 84% (Casteel & Peek-Asa, 2000). In what follows, we consider the notion of defensible space in several settings.

Stores and banks. Convenience stores have been frequent robbery targets. Those with smaller parking lots and those that do not sell gas, both of which decrease the surveillability of the stores' interiors, are held up more often (D'Alessio & Stolzenberg, 1990). One chain of stores incorporated a series of changes, such as putting cash registers right in front of windows and removing window ads to make the interior more surveillable. Robberies declined by 30% relative to other stores that were not redesigned (Krupat & Kubzansky, 1987).

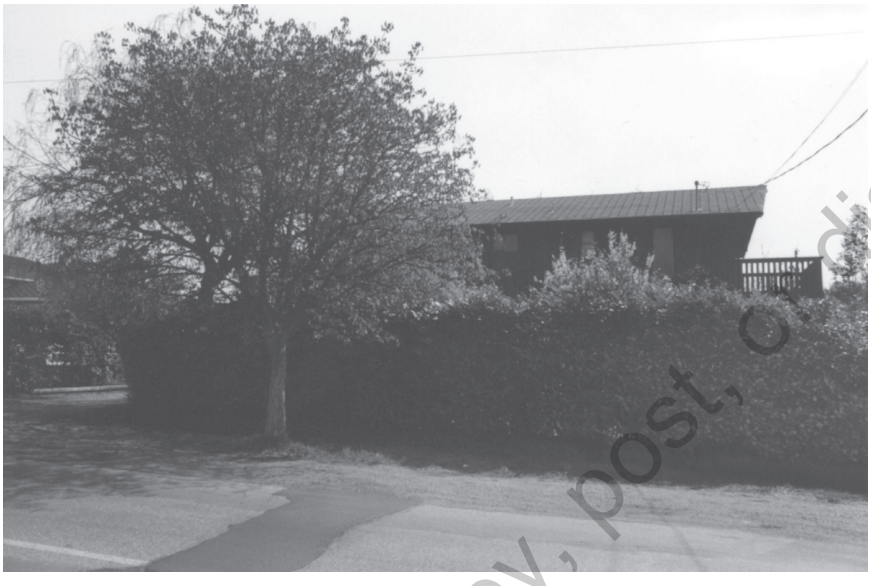
A fascinating study of bank robberies found that several design features are related to increased chances of a holdup (Wise & Wise, ca. 1985). Among these, more robberies occur when the bank has a smaller lobby, a compact square lobby (as opposed to a wide rectangular lobby), and larger distances between its teller stations. These features may be influential because they affect surveillability in the bank lobby.

Residences. In a study involving convicted burglars, convicts examined photos of 50 single-family dwellings and rated each one's likelihood of being burglarized (MacDonald & Gifford, 1989). The defensible space features of the houses were then assessed. As the theory predicts, easily surveillable houses were judged to be unlikely burglary targets. However, actual barriers (e.g., fences, visible locks) had no effect on the perceived vulnerability of the houses, although defensible space theory predicts that they should. According to defensible space theory, symbolic barriers, such as extra decorations and fancy gardens are supposed to communicate to criminals that the residents are especially concerned about their property, and therefore more likely to defend it; symbolic barriers should make burglars shy away. However, the burglars saw houses with symbolic barriers as *more* vulnerable to burglary (see Figure 13.5).

Why? Interviews after the study revealed that burglars viewed actual barriers as challenges that they could overcome; most fences and locks were not seen as serious barriers to them. The symbolic barriers were interpreted not as signs that the residents were especially vigilant, but rather as signs that the houses probably contained more than the usual amount of valuables; if the residents have the time and money to decorate their houses and gardens, the burglars reasoned, the houses are probably full of desirable goods. A study of apartment building burglaries confirmed that accessibility (actual barriers) made little difference, but that surveillability reduced burglary (Robinson & Robinson, 1997).

Burglars cannot accurately pick out houses that have been burglarized from those that have not, but they do use social and physical cues in their guesses (Brown & Bentley, 1993). As discussed in the previous study, they do not see

Figure 13.5 An Indefensible House



locks and bars as serious impediments, but they do worry about neighbors seeing them and about the residents' territorial concerns.

Interestingly, research has revealed that residents and police do not use the same house features as do burglars to infer that houses are vulnerable to burglary (Ham-Rowbottom, Gifford, & Shaw, 1999; Shaw & Gifford, 1994). These studies imply that residents and police need to understand burglars' perspective before they can stop burglary through residential design.

As for other features of residences, more crime occurs in taller apartment buildings and in buildings with more than five units per floor or 50 total units (Rand, 1984). This probably occurs because residents of larger buildings are less likely to know one another, tend to treat each other as strangers, and lose the ability to recognize who lives in the building and who does not. This makes entry by criminals easier.

Communities. Crime and vandalism are linked to, or facilitated by, certain aspects of the physical nature of a community.

Defensible space theory asserts that the actions of both the resident and the criminal are affected by defensible space features. Certain streets in St. Louis have defensible space features, including gateway-like entrances, alterations that restrict traffic flow (by narrowing roads or using speed bumps), and signs that discourage traffic (Newman, 1980). Residents who live on such streets are more often seen outside their homes, walking and working in their yards. Such behaviors might not be overtly territorial; residents might not think of themselves as guarding the neighborhood, yet they seem to have the effect of discouraging antisocial activity. Presumably, intruders are discouraged by this naturally occurring surveillance.

One neighborhood with a high crime rate—in Dayton, Ohio—incorporated some defensible

space changes (Cose, 1994). Many entrances to the neighborhood were closed, speed bumps were installed to slow down traffic, gates with the neighborhood logo were installed, and the community was divided into five mini neighborhoods with physical barriers. Two years later, traffic was down 67%, violent crime was down 50%, and total crime was down 26%.

When an area seems more residential, with few through streets and little public parking, it usually will experience less crime than will houses on the edges of such areas (Krupat & Kubzansky, 1987). The general principle is to reduce passage by strangers through the area, which increases bonds among residents and helps everyone to spot suspicious activity.

However, some areas that *have* defensible space characteristics still have serious crime problems. That is partly because defensible space (the physical layout) does not necessarily translate into **defended space** (i.e., residents actually acting against crime by keeping an eye out or reporting suspicious activity). This can happen, for example, if the neighborhood is not sufficiently cohesive for residents to act together against criminal elements (Merry, 1981). Defensible space *sets the stage* for crime reduction by making it easier—nearly automatic—for residents to fight crime through visual surveillance of outdoor areas, but if residents are unable or unwilling to act on what they see, crime will not be deterred.

A second reason that defensible space does not guarantee a crime-free neighborhood is that not all criminals pay attention to the environment. Less-experienced criminals who are motivated by thrill-seeking or social approval use less-rational criteria for choosing a target; they may simply not pay attention to defensible space features of the setting (Rand, 1984). Also, some criminals are impaired by drugs or alcohol as they work and pay less attention to the environment.

Researchers in the Netherlands have developed a *checklist for assessing the crime vulnerability of neighborhoods* (van der Voordt & van Wegen, 1990). This checklist consists of six main elements that discourage criminal behavior:

- The potential visibility of public areas (lines of sight)
- The actual presence of residents (to take advantage of these sight lines)
- Social involvement (residents caring enough to maintain buildings and act against criminals)
- Poor access and escape routes for criminals, but good ones for potential victims
- Attractive surroundings that evoke care in residents (with decay informing criminals that residents are not vigilant)
- Structural safeguards or not (e.g., locks, presence of easily vandalized walls, phone booths)

The checklist's primary aim is to identify areas that are susceptible to vandalism, but it may be further developed as a tool against other crimes, such as burglary and violent crime.

Vandalism is a widespread destructive behavior. Not every alteration of public territory is vandalism, of course. We can distinguish between vandalism and *people's art* (Sommer, 1972). Part of the distinction involves motive; the artist's goal is to beautify an ugly environment. Vandals are destructive or egocentric; instead of painting a mural that reflects a social concern, they break off a branch of a young tree or scrawl their own names on a subway wall. In contrast, public artists usually seek anonymity yet creatively enhance a bleak place.

Vandals' motive often may be revenge. **Equity theory** emphasizes the idea that social and other behaviors are influenced by each person's perception that social (or other) rewards and costs should be fair. The theory suggests that vandals often are persons who feel they are dealt with unfairly (Baron & Fisher, 1984). Vandalism may be particularly likely when perceived unfairness is combined with a perceived lack of control, a feeling that the injustice cannot be rectified through normal channels. Whether potential vandals have role models who engage in vandalism may also be important (Baron, 1984).

CULTURE CAPSULE

Cultural Differences in Personal Space

Environmental psychologists are acutely aware that human behavior varies considerably around the world. The ways in which people celebrate birth, teach their children, dress, get married, work, and are treated at death are like a colorful tapestry of swirling colors. Yet, in another way, and at another level, people are the same everywhere. They celebrate births, teach their children, dress, get married, work, and recognize death in some kind of ceremony. Personal space is like that; the distance across which individuals interact with one another varies from culture to culture. Yet, in every culture, there are rules that govern the choice of those interactional distances.

Personal space has been described as hidden, silent, and invisible, yet everyone possesses and uses personal space every day. Personal space stretches and shrinks with circumstances. It is interpersonal, so it depends on the people interacting. It refers to the distance people choose to stay from others, but social interaction, involving angle of orientation and eye contact, is also part of personal space. Finally, personal space can be invaded, although such invasions are a matter of degree (Patterson, 1975). In sum, **personal space** is the geographic component of interpersonal relations, that is, the distance and angle of orientation (e.g., side by side, face to face) between individuals as they interact (Gifford, 2014).

Beyond these within-culture variations, personal space is used differently around the world. In one study, for example, groups of four male students came to the laboratory and were told that they would be observed, but were given no other instructions (Watson & Graves, 1966). Half of the groups were composed of Arabs, and half were composed of Americans. The average interpersonal distance chosen by Arabs was about the length of an extended arm, whereas the average interpersonal distance chosen by Americans was noticeably farther. The Arabs touched one another much more often, and their orientation was much more direct. In general, the Arabs were much more "immediate" (close) with one another than were the Americans.

Such findings might lead to overly simplistic generalizations or stereotypes about cultural differences; for example, that some cultures are "close" and others are "distant." However, two studies (Forston & Larson, 1968; Mazur, 1977) revealed that students from supposedly close cultures (Latin America, Spain, and Morocco) chose seating positions that were farther apart from one another than did students from a supposedly distant culture (United States). Furthermore, not all Latin Americans use the same amount of space (Shuter, 1976). Costa Ricans, for example, choose smaller interpersonal distances on average than Panamanians and Colombians.

Despite some oversimplifications, personal space does vary with culture. In one study, for example, Japanese people used more distance in conversations than did Americans, who in turn used more than did Venezuelans. But, when the same Japanese and Venezuelans spoke English instead of their first languages, their conversational distance moved toward that of the Americans (Sussman & Rosenfeld, 1982). Language, an important part of culture, can modify one's cultural tendencies to use more or less interpersonal distance.

The study of personal space is not merely academic; it also has important implications for cultural understanding and conflict. For example, a researcher taught some English students how to act more like Arabs in their nonverbal behavior (Collett, 1971). Arabs who interacted with the trained students liked them more than they did students who had not received such training. Consider the implications for diplomats or even ordinary tourists.

Epilogue

Psychologists have the most difficult scientific job in the world. Natural scientists, even those who study tiny particles or immense galaxies, have the advantage of investigating phenomena that are inherently less complex than they are. Therefore, they can—at least theoretically and at some future time—fully understand the phenomena they study. Psychologists have a more difficult task—to understand entities (people) at their own level of complexity. This is as difficult as frogs trying to understand how and why frogs operate. But beyond that, much of psychology ignores or underplays the important dynamic interaction between people and their physical settings. Thus, environmental psychologists are like frogs trying to understand not only their fellow frogs, but also the manner in which frogs fit into the pond's ecology. No other scientists are faced with a more daunting task.

Nevertheless, for a field of inquiry and action that is only about 50 years old, environmental psychology has made some very significant improvements in the world. One wonders whether other branches of psychology, or even other disciplines, have so positively affected the quality of life of so many people within their first 50 years. From ubiquitous transit maps to international diplomacy, from more humane city plazas to the widespread acceptance of social design principles, from encouraging more environmentally responsible behavior to fighting crime, and from saving lost hikers to facilitating better learning in classrooms, environmental psychology has much to be proud of and can truly say that it has made a difference in the quality of life for millions of people.

Summary

This chapter began by discussing social dilemmas with a particular focus on resource dilemmas that occur in situations where a natural resource may be consumed at a nonrenewable rate, potentially leading to severe environmental and human consequences. The dilemma is that individuals must choose between self-interest (overconsuming the resource), and the interests of the community (cooperating by not overconsuming). Consideration was given to the factors that affect the decisions of people faced with resource dilemmas, with particular emphasis placed on factors, including intervention strategies that lead people to avoid acting on the basis of self-interest.

Next, the chapter explored issues related to the built environment. Social design involves the physical design of buildings and outdoor settings, and places an emphasis on the needs and requirements of people as opposed to more technical and stylistic considerations. Social design has six goals: (a) matching the needs of occupants, (b) satisfying building users, (c) changing behavior, (d) enhancing control, (e) facilitating social support, and (f) employing imageability. Of particular importance is the significant role that architecture plays in shaping human behavior, performance, and feelings of well-being. Defensible space theory posits that certain physical design features influence the likely occurrence of crime and feelings of security. We considered the application of the theory to commercial enterprises, residences, and communities.