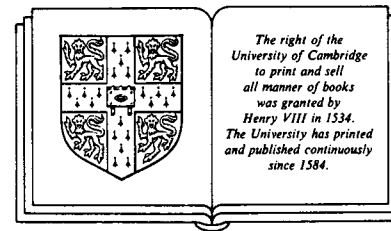

**INQUIRY BY DESIGN:
TOOLS FOR
ENVIRONMENT-BEHAVIOR
RESEARCH**

JOHN ZEISEL

Harvard University



CAMBRIDGE UNIVERSITY PRESS

Cambridge

New York New Rochelle

Melbourne Sydney

OBSERVING PHYSICAL TRACES

Observing physical traces means systematically looking at physical surroundings to find reflections of previous activity not produced in order to be measured by researchers. Traces may have been unconsciously left behind (for example, paths across a field), or they may be conscious changes people have made in their surroundings (for example, a curtain hung over an open doorway or a new wall built). From such traces environment-behavior researchers begin to infer how an environment got to be the way it is, what decisions its designers and builders made about the place, how people actually use it, how they feel toward their surroundings, and generally how that particular environment meets the needs of its users. Researchers also begin to form an idea of what people are like who use that place—their culture, their affiliations, the way they present themselves.

Most people see only a small number of clues in their physical surroundings; they use only a few traces to read what the environment has to tell them. Observing physical traces systematically is a refreshing method because, through fine tuning, it turns a natural skill into a useful research tool.

A simple yet striking example of the use of this method is Sommer's observation of furniture placement in a mental-hospital ward and corridor (1969). In the morning after custodians had neatened up and before visitors arrived, Sommer found chairs arranged side-by-side in rows against the walls. Each day, several hours later, he found that patients' relatives and friends had left the same chairs grouped face-to-face in smaller clusters. Among the inferences this set of physical-trace observations prompted Sommer to make was that custodians' attitudes toward neatness and their beliefs that furniture ought to be arranged for efficient cleaning and food service were incongruent with patients' behavior and needs.

To test these ideas, he rearranged the furniture in the ward, expecting patients to take advantage of the increased opportunities for sociability. For the first few weeks, he was surprised to find, patients and nurses returned chairs to their against-the-wall positions; according to them, the new way "wasn't the way things belonged." Eventually Sommer put the chairs around tables in the middle of the room, and on the tables he put flowers and magazines. When this threshold

of environmental change was reached, changes in behavior took place as well: patients began to greet each other more, to converse more, and to read more, and staff members began a crafts program on the tables in the ward. And it all began when Sommer noticed a difference between how custodians left chairs in the morning and how patients and visitors left them at the end of the day.

The following discussion presents (1) significant qualities that observing physical traces has for use in E-B research, (2) types of devices for recording observed traces, and (3) a classification of trace types to make visible those relations between people and environment that are useful for designing.

Observing Physical Traces
<i>Qualities of the Method</i>
Imageable
Unobtrusive
Durable
Easy
<i>Recording Devices</i>
Annotated diagrams
Drawings
Photographs
Counting
<i>What to Look for</i>
By-products of use
Adaptations for use
Displays of self
Public messages
Context

QUALITIES OF THE METHOD

Observing traces is an exceptionally useful research tool that can produce valuable insights at the beginning of a project, test hypotheses in the middle, and be a source of ideas and new concepts throughout. If you take into account what the method can and cannot do, you can achieve the results you want; like any tool, if used inappropriately it can be destructive. The method can be a source of provocative images, is unobtrusive, is easy to use, and deals with long-lasting phenomena. It provides opportunities for investigators but also sets up some traps.

Imageable

Observing physical traces provides rich impressions and is highly illustrative. Walking through a home for older veterans in Oxford, New York, investigators saw, for example, wheelchairs in odd places, old furniture, new medical equipment, direction signs, people in uniforms, open cans of food on windowsills, and patients' get-well cards taped to walls in rooms (Snyder & Ostrander, 1974). The walk gave researchers an initial picture of what life in that home was like: its design successes, some problems, exceptional situations, patterned wear and tear. At the beginning of a research project, such observations can be used to spark investigators to think about what the observed objects might mean. Skillful observers will notice even commonplace physical traces and figure out which of them will lead to fruitful inferences to pursue further. At Oxford, investigators focused their attention on cans of food on windowsills—developing from this information a central research hypothesis that residents lived a 24-hour life-style out of phase with the institution's 6:00 a.m. to 7:00 p.m. schedule.

From a trace investigators ask questions about what *caused* it, what the person who created the trace *intended*, and what *sequence* of events led up to the trace. The imageable quality of physical traces makes it easy to generate hypotheses about causes, intent, and sequence, but from the trace alone researchers cannot tell how tenable their hypotheses are; to do this, they need other methods. For example, in a brief evaluation of a somewhat run-down housing project in Roxbury, Massachusetts, Zeisel (1973b) found large, well-kept flowering shrubs in residents' backyards. At first he falsely assumed that residents beautified their small yards because they cared about the appearance of the project and wanted their own vistas more scenic. In later interviews with residents he found that shrubs had been planted years before in response to a management-sponsored competition for the best garden. A closer second look revealed that even good-looking plants in the backyards had been very much neglected.

The same potential pitfall can arise when investigators falsely infer intent. One morning a group of architects visiting a housing project for older people in a predominantly Italian section of Boston noticed a bocce-ball court surrounded by apartment windows. It looked as if it had never been used. They tentatively concluded that something was wrong with the facility, that residents did not like playing bocce ball, or that they did not like the location of the court. In fact, the court looked brand new because workmen had just completed it several days before. In addition, it was early morning, and anyone who might have used the court was still at home.

It is also difficult to infer process. In a suburban Boston prison, cell walls are papered from ceiling to floor with *Playboy*, *Penthouse*, and *Swank* centerfolds. At first glance it seems impressive that prisoners fix up their dwelling units so extensively—that they mark out and personalize territory so dramatically. But the impression the traces give is misleading. Most centerfolds have been glued to the cell wall by a series of previous inmates. Walls are not stripped when a new

inmate moves in, every 6 to 12 months. The wallpapered surroundings that inmates move into offer them many diversions but little chance to personalize.

Visual trace records can be used as illustrations of research concepts. This can prove useful to investigators who want to follow up on trace observations with interviews to test their hypotheses. In studies of property damage in parks (Welch, Zeisel, & Ladd, 1978) and in schools (Zeisel, 1976a), for example, investigators showed slides of damaged property to groups of teenagers, park personnel, and persons living next to the property in order to focus discussion on what these people thought about property damage.

In lectures and reports, pictures of vivid traces can help viewers and readers understand physical settings in which projects were carried out. Lenihan (1966), in his report evaluating the VISTA program in the 1960s, wanted readers to understand the wide variety of volunteers' assignments: Appalachian mountain villages, Southwestern desert towns, urban slums. He used photos of physical traces to augment the poetry of his writing.

The force of concrete visual impressions can be a pitfall for careless researchers. The visual impact of even low-frequency observations can be so great—flowering bushes, nearly new facilities, vandalized windows—that they dominate a researcher's mind. To a person walking through a well-kept housing development, the beauty of a few flowering bushes can give the impression that there are flowers in bloom everywhere, even though few residents have bushes and only some are flowering. When such traces are photographed and presented out of context, they can mislead—a problem of false emphasis the visual communications media face every day. It is important that observers also train themselves to see traces that do not stand out, such as the scarcity of certain expected objects or the absence of wear and tear. If you ask yourself "What traces are missing?" in addition to "What traces do I see?" you are more likely not to be seduced by visually impressive traces. You will begin to see what is not there.

Unobtrusive

Observing traces is an unobtrusive method (Webb et al., 1966). It does not influence the behavior that caused the trace.

Unobtrusiveness is particularly valuable when gathering data about which respondents are sensitive or when respondents have a stake in a certain answer. For example, an investigator who wants to know how strictly hospital attendants follow fire-safety rules will learn more from counting the fire exits blocked by stretchers than from interviewing attendants, who may want to paint a rosier picture than actually exists. School principals who want to avoid showing they are not doing a good job may report less damage to school property than a researcher might observe directly. And principals who want the school committee to increase the budget for maintenance may magnify the damage. If a respondent at home knows a researcher is coming, she may neat up the house

beforehand, putting away such physical traces as toys in the living room, which might indicate how different rooms are used.

Observing or measuring traces does not require being present when the traces are created. The method is therefore particularly useful to find out about rare events, hard-to-see events, private behaviors, and behavior of groups who cannot be interviewed. Zeisel's school study (1976a) provides an example of using physical traces to document private behavior that is hard to observe directly. During the day teenagers can be seen hanging out around schools, playing stickball against walls, and sometimes climbing onto rooftops. At night they sometimes find out-of-the-way places around back to sit together, drink, and smoke. Boston teenagers treat these half-hidden settings as clubhouses where outsiders are not allowed. The first hint of such nighttime clubhouse activity came from physical traces: empty beer cans, discarded playing cards, cigarette butts, graffiti, and broken lights.

Durable

Many traces have the advantage for researchers that they do not quickly disappear. Investigators can return to a research site for more observations or counting and can document traces with photographs or drawings. Of course, the more permanent a trace is, the greater its chance of being observed at all. For example, rock gardens and paving stones in someone's garden will be visible for years, long after grass and flowers have virtually disappeared.

There is, however, the problem of selective deposit. Some activities are more likely to leave traces than others. The extent of beer drinking in back of a school can be detected the next day by the number of cans. Playing poker or smoking nonfilter cigarettes may leave no traces at all.

Another consequence of the durability of traces is their cumulative quality; earlier traces can encourage later ones. A large number of people may feel free to cross a lawn because people who did so before left a path, whereas few people would do so were there no path. This cumulative quality can cause problems for investigators who overlook it, who think each act is independent of earlier ones. But if traces are not taken out of context, their cumulative character can provide insights for data gathering and analysis. The finding, for example, that litter tends to beget litter (Finnie, 1973) is particularly useful if you want to arrange maintenance schedules in parks and around schools.

Easy

Physical-trace observation is generally inexpensive and quick to yield interesting information. The inexpensiveness of a brief physical-trace survey makes it possible in most research projects not only to discover but also to explore in greater depth a host of initial hypotheses. Using more costly methods

would mean discarding possibly fruitful but implausible hypotheses without looking at them closely. This same quality means, however, that researchers can waste their energy because time and money do not force them to think through each initial proposition rigorously before going into the field.

The speed and ease with which physical traces can be recorded—in still photographs, sketches, notations—make the method useful for collecting a great many data for speedy review. An initial site visit can yield enough recorded observations for weeks of review and analysis. This is helpful in generating a range of testable propositions and hypotheses. Yet the harvest can be so rich that it seduces a research team not to look further: “We already have so much information. Why do we need more?”

In sum, observing physical traces is imageable and unobtrusive, deals with durable data, and is easy to do. The following sections of this chapter discuss ways to record trace observations and a classification of traces particularly relevant to questions of design.

RECORDING DEVICES

Investigators save energy and time by deciding before going into the field how and when they will record trace observations: annotated diagrams, drawings, photographs, precoded counting lists, or a combination of these. If photographs are chosen, researchers decide such issues as whether prints or slides will be more useful for the purposes of the study or whether both are needed. Each decision affects how trace observations can be analyzed, how they can be used in conjunction with other research methods, and how findings will be presented.

Observations ought also to be timed to avoid possible systematic effects of maintenance schedules or predictable activity cycles on the data—for instance, early morning cleanups that obliterate signs of teenagers’ night life around schools.

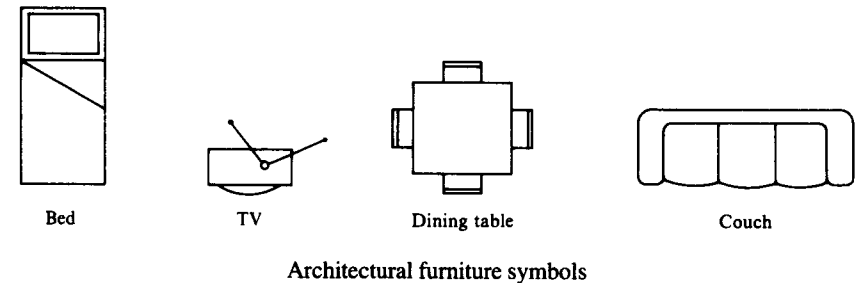
Annotated Diagrams

Recording traces verbally and diagrammatically, as a rule, requires little preparation and no special skills. Except for a notepad, the recording method is unobtrusive; to make it still less obtrusive, trained observers may memorize major traces in a setting and record them later. This is especially possible when the setting is simple and the objective standardized, as when making diagrams of furniture layouts in people’s living rooms for a study of what furniture people own and how they arrange it.

During a two-person interview one interviewer can inconspicuously draw a plan of the setting and note where objects are located and where physical traces

are. In settings where cameras are out of place or lighting is difficult and the researcher does not want to use flash attachments, written trace notation is appropriate. Annotated diagrams are also well suited when traces can be recorded on two-dimensional plans and then studied. The arrangement of chairs Sommer (1969) observed in the patient dayroom could perhaps be represented in plan more effectively than in photographs.

When annotated diagrams are chosen as one of the recording devices, several rules of thumb can be helpful. Agreement among researchers on a set of standard symbols will increase comparability of the data within a project. For a residential floor plan, for example, a team might use traditional architectural symbols for furniture. When researchers on several projects use such standard and easily understood symbols, their data can be more easily compared and shared.

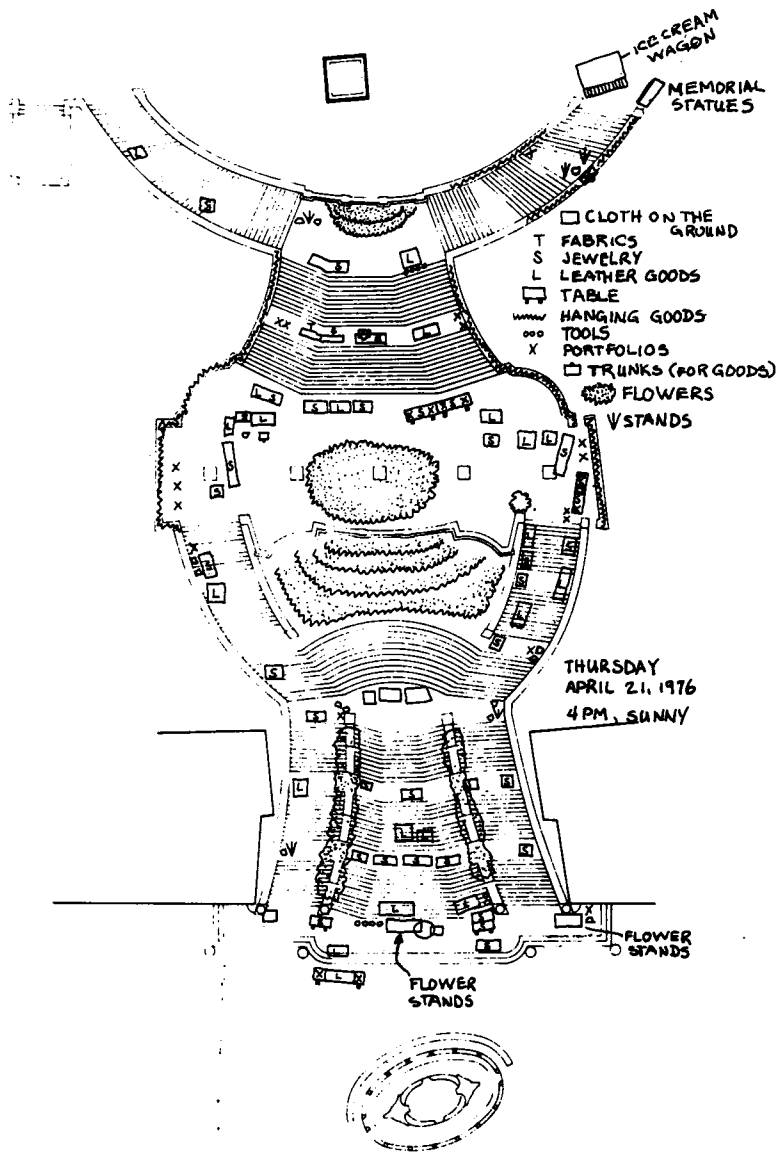


Outdoors and in special settings, investigators may have to be more inventive about the symbols they use. In their study of peddlers and pedestrians on Rome’s Spanish Steps, Günter, Reinink, and Günter (1978) developed a set of symbols for recording how peddlers arranged their wares (see next page).

If you want your observation notes not to be confused with your reactions to what you saw, you must not analyze them in the field. Provisions need to be made to facilitate subsequent analysis.

A simple device can facilitate preliminary analysis of field notes with a minimum of fuss: Original notes and diagrams are made on the left half of the notepaper, leaving the right half open for recording hunches and preliminary hypotheses (see the illustration “Furniture Layout in El Barrio Apartment,” p. 97). A wide margin can be made on any notepaper simply by creasing it.

If investigators know the floor plans of the places to be observed, and if more than one similar place is to be observed or the same place is to be looked at several times, their notepaper can have a floor plan printed on it. This facilitates making notes and ensures comparability of diagrams. This method can be used equally well for interiors, such as offices, waiting rooms, or dwelling units (Zeisel, 1973a) and for exteriors, such as playgrounds, street corners, or plazas (Günter et al., 1978).



Annotated diagram of the Spanish Steps. (From *Rome-Spanische Treppe*, by R. Günter, W. Reinink, and J. Günter. Copyright 1978 by VSA-Verlag, Hamburg. Reprinted by permission.)

OBSERVATIONS	COMMENTS
	<p><i>Does the stair location discourage residents from using the furthest door, the one into the living room?</i></p> <p><i>Does the bathroom location next to the kitchen/eating area bother residents?</i></p> <p><i>The kitchen seems to be the main place to eat. Is it big enough?</i></p> <p><i>Is the darkness in bedrooms — caused by drawing curtains — for privacy? If so, is it privacy from neighbors looking in or from the rest of the family?</i></p> <p><i>The living room door permanently covered seems to indicate that the kitchen door is the main and only entrance to the apartment.</i></p> <p><i>Does this mean that most people sit in the kitchen most of the time?</i></p> <p><i>Pictures, saint, and expensive TV in the living room seem to say "this room is a revered, special, almost sacred room." Is it?</i></p> <p><i>Does blocked living room door covered by a curtain mean it is improper to invade the "sacred" room?</i></p>

Furniture layout in El Barrio apartment: Sample field notes from Zeisel, 1973a

Drawings

If observers have the skill to make sketches of the traces they see, the time it takes may well be worthwhile. Drawings can be extremely useful in final reports because they are highly imageable and inexpensive to reproduce.

Photographs

Photographs of physical traces taken at the beginning of a research project can give all parties working on it an initial overview of the types of things they are likely to see in the field. Discussion of photographs among team members can quickly generate hypotheses about possible fruitful issues for further study. A group can leisurely discuss what behavior a trace might reflect and what intent might be behind it. For these reasons, it is generally valuable to document both easily photographed outdoor traces and indoor traces, although indoor ones may be harder to photograph. Photographs are particularly valuable if the research site is not easily accessible because it is too far away, requires special permission to visit, or is altogether temporary (for example, a circus).

When investigators expect to count traces, they can first analyze photographs of observations to decide on categories for counting. Photographs can be used as stimuli in focused interviews, to determine the categories respondents use when they see such things. At the end of a project, photographs are excellent to illustrate verbal presentations of findings. Many of these qualities hold for photographs in research, whether they are of physical traces or of behavior.

In the field several rules of thumb and a few tricks can possibly save time, money, and embarrassment. Expensive cameras are seldom more useful as research tools than inexpensive ones. Researchers need to take some photographs themselves because they know what to record for analysis—what to include in the picture and what to leave out. For illustrative photographs, one can always hire a professional photographer (or choose the most skilled researcher). Even then one will have to tell the professional precisely what to photograph. When extra equipment is needed—for instance, flash attachments or tripods for interior photographs—it must be selected with consideration of both research requirements and respondents' sensitivity.

A researcher's choice of film has perhaps the greatest consequences for the rest of the study. Black-and-white photographs, useful as illustrations, can also be made useful as objects for group discussion. Color photographs are expensive and difficult to print. From contact sheets or directly from negatives, researchers can choose a number of photographs which seem to cover the range of concerns they are aware of, which seem to be most interesting, or which require more discussion and analysis to understand. These photographs can be inexpensively printed as large blowups on a microfilm printing machine, available at most libraries. Although such prints cannot be used as permanent records because they fade after several months, they can be put on a wall for analysis and discussion.

Arrayed in this way, photographs enable all members of a research group to participate in initial visits to the site.

Color slides have other benefits. In addition to being convenient and captivating during oral presentations, slides can be easily grouped and regrouped for analysis on light tables or in projectors. Some slide films can be developed commercially in just a few hours. When it is essential to know that you have all your data before leaving a site, or when you want to make a presentation shortly after making observations, slide film that can be quickly developed or even instant-print film may be a lifesaver.

Counting

Certain traces yield their full value only when their quantity is taken into account. In such situations it will suffice to record in detail one or two examples and count the rest. For example, in a housing project where some families have fenced in their backyards and some not, photographs of a few along with a careful count will do the job.

If you know what you want to count beforehand, precoded counting pads or checklists can be arranged—possibly linked to the site plan for accurate location data.

As important as choosing appropriate categories is intersubjectivity of the categories among observers. Each member of a team of observers faced with the same physical trace ought to record it as a trace in the same category if data are to be comparable. To achieve a degree of intersubjectivity, observers in the U.S. housing census are shown photographs representing distinct levels—and therefore categories—of housing deterioration. On the basis of these “exemplars” this very large group is expected to develop a shared way of looking, at least to some extent.

Another practical way to develop intersubjectivity among investigators is to take them on a site visit to settings similar to those at the research site. Through group discussion they can learn from one another and arrive at a consensus of how items they see would be recorded.

Each way of recording traces catches another dimension of the trace and provides researchers with new data.

WHAT TO LOOK FOR

What an investigator chooses to observe depends on what he wants to do with the data he gathers. If I want to identify my mother in a crowd, I will try to notice only women whose hair is brown with a gray streak. If you want a police officer in New York City, you will look for and “see” only people in dark blue uniforms.

The following categories for looking at and gathering data about physical traces are organized to increase designers' control over the behavioral effects and side effects of their decisions and to increase people's own control over their relation to the environment. Both these purposes are means to another end: to increase everyone's ability to intervene through design to make settings better suited to what people actually do. These purposes translate into such questions as the following: How do environments create opportunities for people? Where do people and their surroundings impinge on each other? Where do they limit each other? How do people use the environment as means to an end? And to what ends? What design skills do people have? How do they manipulate their surroundings? How do people change environments to meet their needs? What takes place in particular settings? To answer such questions, the following organization for observing physical traces is useful.

Physical Traces to Look for
<i>By-products of Use</i>
Erosions
Leftovers
Missing traces
<i>Adaptations for Use</i>
Props
Separations
Connections
<i>Displays of Self</i>
Personalization
Identification
Group membership
<i>Public Messages</i>
Official
Unofficial
Illegitimate

By-products of use, the first category, reflect what people do in settings—such traces as litter or worn spots left behind by someone who used, misused, or failed to use a place. The other three categories represent things people do to settings. *Adaptations for use* reflect changes by users to make an environment better suited to something they want to do: a fence built, a wall broken down, a lawn changed into a patio. *Displays of self* are changes people make to establish

some place as their own, to make it express who they are personally: a flag or a religious symbol on front lawns; mementos of trips on windowsills. *Public messages* are changes such as wall posters and graffiti, by which people use environments to communicate with a large public audience, sometimes anonymously.

What you look for depends on what you want to do with the data. Ruesch and Kees, in their perceptive book *Nonverbal Communication* (1970), describe using data on facial expressions, body movement, and physical traces to understand how people communicate without words. Their emphasis on communication leads them to underplay traces in the categories of adaptations for use and by-products of use but provide a more detailed analytic scheme for displays of self. Another important description of how to observe physical traces is included in Webb et al., *Unobtrusive Measures* (1966). Webb et al. describe the usefulness of a range of measures—for example, counting bottles in garbage cans to see how much people drink, observing litter in the park, and analyzing suicide notes. The categories they develop are not all equally suited to solving E-B questions. For example, they use the term *accretion* to describe any type of physical trace left behind, without specifying the manner in which it was left—the actor's environmental intent. All but one of the categories discussed in the following pages and several discussed in Chapter 12, on archival methods, are examples of accretion. For clarity I have, therefore, scrupulously avoided the use of this important but broad term.

By-products of Use

Sherlock Holmes, Miss Marple, Hercule Poirot, and Lord Peter Wimsey are masters at detecting and correctly interpreting side effects of behavior—worn-away stair treads, a smudge on a door, or a glass wiped suspiciously clean of fingerprints. These examples represent three types of by-products: erosions, leftovers, and missing traces.

Erosions. Use can wear away parts of the environment: grass is trampled where people walk from a parking lot to a nearby building entrance; grooves are cut into the top of a butcher's block table.



Erosions

Some erosion traces, such as the scars in the butcher's table, indicate to the interested researcher that planned and predicted activities have taken place; others that the environment is being used in a new way, such as the path across the lawn. Because most environments sustain some wear and tear, observers must be careful to distinguish between erosion traces that signify bad design, those that reflect uses designers planned for, and traces left when new and appropriate activities took place. Erosion traces, and in fact all by-products of use, can be the first step in finding out what those who use the setting feel about it.

Leftovers. Physical objects as the result of some activities get left behind: cigarettes in ashtrays after a party, dishtowels hung on kitchen-cabinet knobs next to a sink, open cans of food stored on windowsills in a veterans' residence.



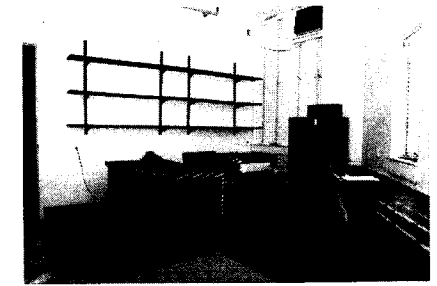
Leftovers

Like erosions, leftovers may indicate activities that have been planned for, such as parties, and unplanned for, such as residents eating soup in their rooms. Such leftovers as the dishtowel, however, tell you about planned-for activities that have unplanned-for side effects—in this case the need for towel storage.

Leftovers help to locate (1) places that accommodate planned-for activities, (2) places that only partly accommodate expected activities, and (3) places that are used in unanticipated ways.

Missing traces. Erosions and leftovers in settings tell us about what people do. When we see neither of these, or even very few such traces, it tells us about what people do *not* do. Apartment balconies with no chair to sit on, without even a stored winter tire or a clothes-drying rack, and an office with nothing on the wall or table to betray the occupant's individuality demonstrate missing traces.

Inquiring about why traces are missing can uncover seemingly irrelevant physical design decisions that limit behavior. For example, some balconies have bars spaced so wide apart that families with small children are afraid to use them. Sometimes missing traces are explained when researchers probe rules about how a place may be used: "No family photos allowed on office walls." Asking "why"



Missing traces

may lead to not very useful answers: "The apartment is vacant because tenants just moved out." But it may also lead quickly to fruitful insights, because not to use an available space is quite a strange thing to do.

Adaptations for Use

When some people find that their physical environment does not accommodate something they want to do, they change it; they become designers. Some professional designers try to predetermine as little as they can in buildings and other facilities so that residents have the greatest opportunity to join in design by adapting the setting the way they want (Habraken, 1972; Turner, 1972; Wampler, 1968). At the other extreme are designers who try to plan for everything they think will occur—from built-in furniture to the color of curtains. The former is called "loose-fit design," the latter "tight-fit." But no matter what the original designer wants or expects, people who use environments redesign them. Researchers and professional designers can learn a great deal from this adaptive redesigning.

Adaptive traces are significant for designers because they are direct manifestations of design by users. They take place in the fuzzy area between what professional designers and lay designers do. Such traces are difficult to interpret, but one does not have to estimate whether they will lead to action, as one does with attitudes.

People change settings to better support activities: to facilitate and sustain them. They may remove inappropriate props, such as built-in lights that are unadjustable, or add new ones, such as a backyard barbecue pit to make eating out easier. For the same ends, they can alter the relations among settings—creating both new connections and separations, such as windows and walls.

Props. When users add things to or remove things from a setting, they create new opportunities for activity. Inasmuch as the things support activities, we can think of them as staging props purposefully arranged by users: a wood-burning stove installed in someone's apartment living room; play equipment added to an empty lot to change it into a playground.



Props

New props may have been added because users or uses have changed or because certain activities were overlooked or considered unaffordable in original designs. Props added for either reason may reflect a particular user's idiosyncratic wants, such as the living-room stove, or they may reflect more normative behavior common to a larger group.

Separations. Changes may separate spaces formerly together, increasing such qualities as privacy, control, and darkness or more sharply dividing territories: ground-floor apartments with covered-over windows, stones along someone's property line, "Keep Out" signs on back doors of buildings.

Separations can be particularly informative about side effects of design decisions. The parking areas in the interior of Castle Square, a housing project in Boston's South End, were deeded officially to the city so that it would maintain them, plow them, and pick up garbage on them. But as an unanticipated side effect, people who work in the surrounding neighborhood park there during the day and sometimes all weekend. Residents feel that this infringes on their informal right to park their cars just in front of their houses, and so they place wooden sawhorses across the parking places in front of their doors to stop other people from parking there.

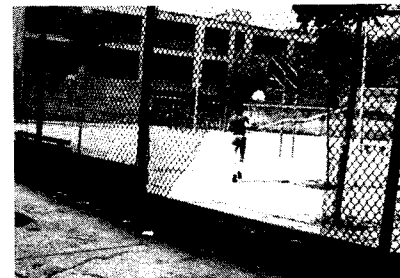


Separations

Separations do not necessarily block physical movement or all the senses at once. They may, for example, be only visual (an opaque cardboard wall around a work area), auditory (a blaring radio in an office so nobody can overhear a conversation), olfactory (a fan to keep kitchen smells out of the living room), or symbolic (a three-inch-high brick border around a front yard).

Connections. Physical adaptations for use may connect two places, enabling people to interact in new ways: holes that teenagers strategically cut in a playground fence to enable players to get in without walking around to a distant gate; pass-throughs cut in walls between living rooms and windowless kitchens to provide a view out when residents eat in the kitchen. Buildings converted to restaurants often have windows cut into swinging kitchen doors so that people serving can avoid bumping into each other when coming from opposite directions.

Connections that users of a facility make can indicate that the original designer overlooked a common behavior that requires being able to move, see, hear, or talk between one space and another or that such activity developed since the place was designed (as with the window in a swinging restaurant door). Of course, sometimes users may want a connection that setting managers do not. An example would be hacksawed bars on a prison-cell window after a jailbreak.

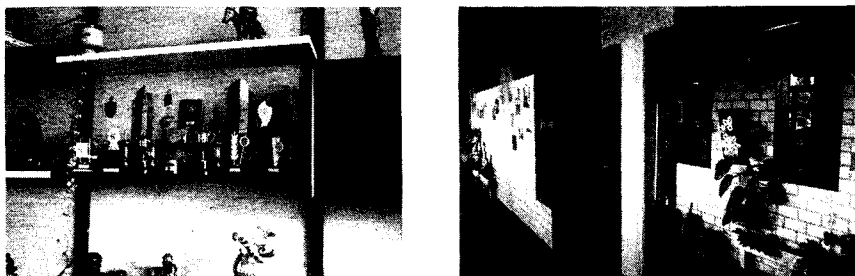


Connections

Displays of Self

Residents change environments to put their stamp on them—to say "This is mine and it says something about me." Displays of self may be directed toward other people, but just as often the changes mean something mainly to the person who makes them: mementos of trips, family portraits, doll collections. Displays may help others identify a person's environment—name plaques on the front door—or may tell people about the person by announcing what groups she is a member of.

Personalization. People use environments to express their uniqueness and individuality: a style of furniture in the living room, trinkets on the windowsill, silly signs on businesspeople's desks. Each such use shows how someone is different from his neighbor—in taste, in personality, in habits.

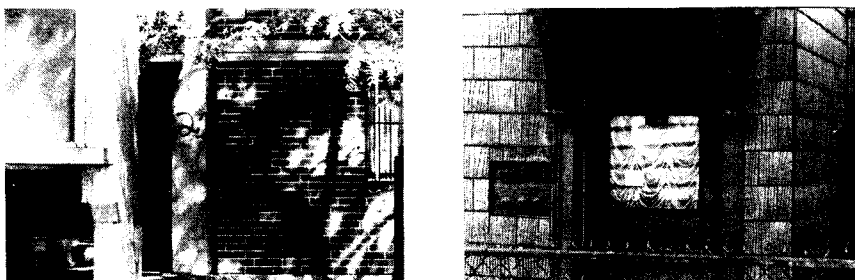


Personalization

To show off personalization traces and other displays of self, people find and make such display cases as windows, walls, doorways, car bumpers, shelves, and window ledges in almost any kind of setting, from offices to homes, from hospitals to schools. By observing how parts of the environment are useful as display cases, you can improve your ability to design environments that provide opportunities for displays of self.

Identification. People use their environments to enable others to identify them more easily: names of students on school lockers, initials on commercially bought sun awnings for homes. Such markings are people's individual street signs, even if they are just numbers: house numbers, office numbers, cell numbers.

Who leaves a trace can be significant. If a student writes his name with felt-tip pen on a school locker, the locker might mean something to him. How important is a home territory like this to him? Felt-tip ink is difficult to remove.



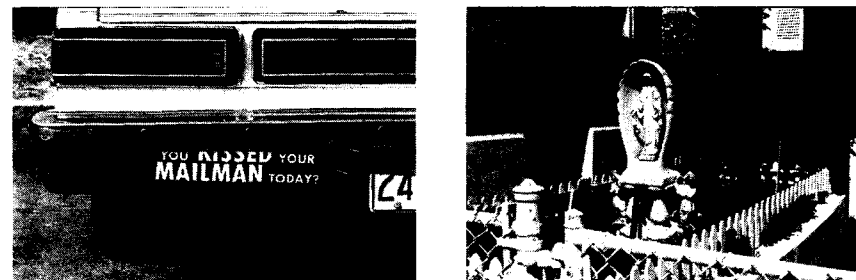
Identification

Did he do this on purpose to leave his mark for the next student? Would he use a name tag provided by the administration? If so, what would he feel about it? More important, what would this indicate about the relationship between students and administrators?

How permanent a trace is may also be significant. Does the name of a family etched into the wood of their front door mean they hold different attitudes toward the neighborhood than their neighbors whose name is spelled out with store-bought plastic letters in the lawn? The family with plastic letters may feel no less permanent, but rather have greater respect for wooden doors.

Group membership. In addition to displaying their individuality, people also display their membership in formal groups and organizations: religious, academic, fraternal, political, ethnic, cultural, professional. Religious statues on front lawns, professional diplomas on living-room walls, ethnic dolls in windows, pictures of President Kennedy, awards from one's company for reaching a sales quota all tell you about the groups an individual identifies with.

Group-membership signs are often carried around on more mobile display cases: car bumpers, high school jackets with emblems, T-shirts.



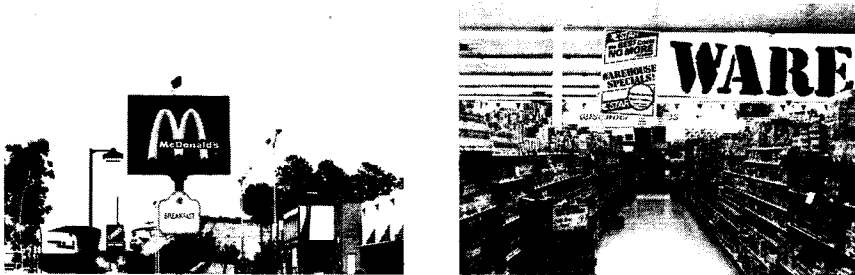
Group membership

Observers can easily overlook group-membership traces of unfamiliar groups. For example, hot-rod owners identify themselves by extra-wide wheels on their cars, with the manufacturer's name in large, raised, white letters. This practice is derived from actual race-car drivers, who are paid to advertise brand names on their cars and hence have wheels like this. Such signs of group identification can be meant mainly for other group members. To attune yourself to see traces like these with in-group meanings, you can assume that displayed objects you see have such meanings and then ask about them.

Public Messages

Physical environments can be used to communicate to the public at large. Most, but not all, public messages appear in public places.

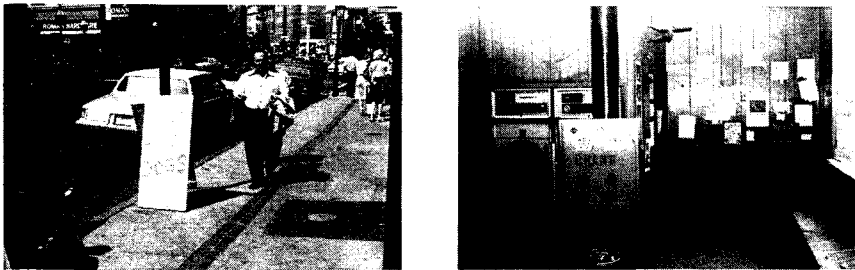
Official. Probably the most frequently seen public messages are official ones erected by institutions, which may even pay for the right to do so: advertising signs, names of commercial establishments, place names. They reflect official uses of settings—the behavior of paying clients.



Official public messages

Official public messages usually appear in environments designed for that purpose. The private right to display official public messages is increasingly being challenged by the public, asserting its right not to see them.

Unofficial. Individuals and groups also communicate publicly by means of settings not designed specifically for that purpose. Unofficial messages usually announce short-term events and are often accepted and even expected on surfaces in public places: theater placards on wooden walls surrounding construction sites, political posters stapled to telephone poles, and “Lost Cat” announcements taped to laundromat windows.

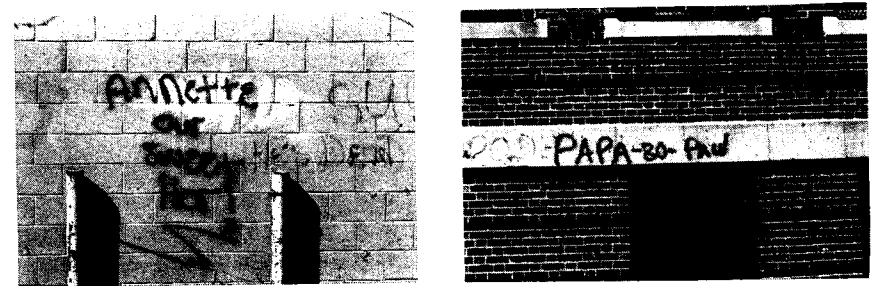


Unofficial public messages

Informal public messages tell investigators about such things as types of cultural events taking place in an area, proportion of students living there, and political activity. Some bookstores and supermarkets establish tack boards for

such messages. But the usual traces left from unofficial public communications are shreds of paper stuck to lampposts, brick walls, and newspaper stands.

Illegitimate. Messages to the general public which are not planned for, for which environmental adaptive changes are not made, and which, although sometimes expected, are seldom if ever approved of, are considered by many to be illegitimate uses of public environments. The most frequent example of illegitimate public messages is graffiti. Political graffiti with antiauthority slogans or antiethnic slogans often appear in prominent public places. Members of teenage gangs in large American cities stake out their turf by writing their name and street number on walls.



Illegitimate public messages

Illegitimate as I am using it here does not imply a value judgment. It merely refers to official disapproval of the activity. Those who engage in the activity may find it completely legitimate. For example, almost everywhere students paint lines on walls of schools to enable themselves to play games: a hockey goal to play street hockey or a square strike zone to play stickball. They consider such lines as legitimate as the neatly painted official lines on the basketball court (Zeisel, 1976a). Others may consider the lines attacks on society.

Such “illegitimate” expression may have useful social side effects. Gang graffiti, establishing territorial boundaries, possibly reduce gang conflict. Political slogans give minority political groups visibility.

Context

Traces clarify their context and are clarified by them. A square painted on a wall may mean nothing. Near a school it is a stickball strike zone and signifies that the area is used for street games. When looking at physical traces, researchers must keep in mind that they are trying to look beyond the trace itself to understand a larger picture. That larger picture can emerge only if you see the context of what you observe.

OVERVIEW

A good way to begin almost any E-B research project is to walk around the research site looking for physical traces of behavior. It is easy to do, can be done unobtrusively, and provides investigators with rich imagery to build on in solving their problem. Trace observation can be carried out both qualitatively and quantitatively.

This chapter has discussed categories of traces particularly appropriate for E-B observations: by-products of use, adaptations for use, displays of self, public messages. The first category represents remnants of what people do *in* an environment, the others of what people do *to* it. This way of looking is aimed at increasing our ability to intervene through design to make settings better suited to what people actually do.

The next chapter discusses how to observe the other half of the E-B equation: behavior.

Chapter 8

OBSERVING ENVIRONMENTAL BEHAVIOR

Observing behavior means systematically watching people use their environments: individuals, pairs of people, small groups, and large groups. What do they do? How do activities relate to one another spatially? And how do spatial relations affect participants? At the same time, observers of environmental behavior look at how a physical environment supports or interferes with behaviors taking place within it, especially the side effects the setting has on relationships between individuals or groups. In a park, for example, an observer sees a child playing, watched over by her father, who anxiously jumps up every time the child moves out of his sight. The child's being hidden from view triggers a reaction by her father. The event tells an observer something about the child's activity and the importance for the relationship of maintaining a visual link between father and child.

Observing behavior in physical settings generates data about people's activities and the relationships needed to sustain them; about regularities of behavior; about expected uses, new uses, and misuses of a place; and about behavioral opportunities and constraints that environments provide.

You do not have to be an expert to observe behavior. Before entering a party or a restaurant, you may survey the scene to see what behavior is appropriate there. An alert new student in a school watches who plays where in the gymnasium, who sits where in class, and who sits with whom in the cafeteria. Environment-behavior researchers systematically make the same types of observations with different ends in mind.

Hall's classic description of how people behave in and use space, *The Hidden Dimension* (1966), draws heavily on behavior observation in natural settings. Sensitive behavior observation led Hall to discover the important spatial dimension to human communication. He observed, for example, that how far or how close people stand reflects their social relationship—distance generally meaning coldness and closeness generally meaning friendliness. Further behavior observation turned this rather simple conclusion into an exciting insight: the way people from different cultures interpret spatial distances can lead to misunderstanding, even insult. For instance, an American might feel he is being friendly by standing several feet from an Arab friend during a casual conversation. The

Arab, attributing meaning to space, feels the American to be cold and distant and moves closer. The American takes this move to be aggressive. He steps back. To the Arab, this is clearly an attempt to be unfriendly—an insult.

This chapter presents qualities of the research method for E-B studies, some practical steps observers can take to prepare for observing environmental behavior, and how to organize observations to learn the most about the relation between settings and what people do in them.

Observing Environmental Behavior
<i>Qualities of the Method</i>
Empathetic
Direct
Dynamic
Variably intrusive
<i>Observers' Vantage Points</i>
Secret outsider
Recognized outsider
Marginal participant
Full participant
<i>Recording Devices</i>
Notation
Precoded checklists
Maps
Photographs
Videotapes and movies
<i>What to Observe</i>
Who: actor
Doing what: act
With whom: significant others
Relationships
Context
Setting

QUALITIES OF THE METHOD

Observing behavior is empathetic and direct, deals with dynamic phenomena, and allows researchers to vary their intrusiveness in a research setting.

Empathetic

Researchers observing people soon get a feeling for the character of a situation. Observation, especially participant observation, allows researchers to “get into” a setting: to understand nuances that users of that setting feel. When personal quirks of observers influence the recording of observations, their reliability can be questioned. Yet personal feelings may provide essential initial research insights that a study can revise and elaborate.

Jacobs' *Death and Life of Great American Cities* (1961) is based largely on behavior observations that Jacobs made while a resident in New York's Greenwich Village. Her perspective enabled her to describe empathetically what it is like to live on a street where people look out their windows at passers-by, children play on the sidewalk in view of neighbors and parents, and shopkeepers serve as news outlets and street guardians.

That observing behavior seems so easy and obvious can present problems. It is common for observers to report observations in seductively authentic descriptions that, unfortunately, omit details and transfer untested feelings. Missing are standardized procedures for observing and a theoretical framework for interpreting observations. Having explicit procedures and theory increases the likelihood that different observers' descriptions are comparable, enabling readers of observation reports to interpret and evaluate them more easily.

Empathy can be taken too far: observers may assume that the way they personally feel in a situation is the way everyone else feels. For example, an observer who dislikes being with many people might assume that the high level of contact on Jacobs' close-knit urban street makes most people anxious and uncomfortable.

Observers also run the risk of overlooking differences between people, unless they formulate their feelings into testable hypotheses. On Greenwich Village streets, how many people choose to look out their windows to participate in a neighborhood life important to them, and how many do so because they have nothing else to do? How many parents talk to other parents while watching children play because it is what is expected of them, and how many do so because they are lonely and want the contact?

Direct

Respondents often hesitate to report that they break formal rules: smoking in school hallways near “No Smoking” signs; two families living in an apartment designated for one family. Yet they do not care if they are seen doing such things, because they and their friends or neighbors find such behavior acceptable.

The same can be true for behavior that, although acceptable to a particular group, breaks the informal rules of a larger one. A cross-cultural example of the resulting need for direct observation is evident in Chandigarh, Le Corbusier's modern capital of India's Punjab province. Many residents of this administrative

center are aspiring middle-class civil servants who live in buildings that reflect modern norms to which some of the more traditional Indians do not keep. For example, some residents reported that they used the kitchen counters to prepare meals, but when Brolin (1972) looked more closely, he found that they followed the traditional Indian practice of cooking on portable stoves on the floor. One resident assured Brolin that, caste distinctions being obsolete, everyone including servants used the front door. Brolin was surprised to observe household servants using the back door. Had Brolin used only interviewing techniques, he might never have observed such rule-breaking activity.

People also tend not to report to interviewers activity they think is trivial and therefore not worth reporting. Nonetheless, a seemingly trivial datum may be central to an environmental research question. For example, if someone asked you now to describe what you had been doing for the last two minutes, you would probably say that you had been reading. You might describe as well the position you are in—sitting, lying. You probably would not say that you were leaning forward or backward and that you had just turned the page, although to design a comfortable library these details may be important.

Because observing behavior can be intensely personal, trained and sensitive researchers able to perceive relevant nuances can use the method more fruitfully. Being on the spot allows researchers to adjust their observations to a particular setting and to a refined understanding of the situation. Whyte's personal research capabilities are evident in his participant-observation study *Street Corner Society* (1955). His day-to-day involvement with a street gang enabled him to uncover more than ordinary evidence.

Whyte noticed, for example, that one gang member, Alec, regularly bowled higher scores than gang leaders during the week. But when the whole gang bowled together on Saturday night, their scores paralleled the gang's hierarchy. The leaders bowled the highest scores, while Alec came in last.

When a "follower" was bowling too well, his companions would heckle him, saying such things as "You're just lucky!" and "You're bowling over your head!" When Doc, the leader, bowled poorly, they would shout encouragement, telling him he could do better. Whyte noticed that gang members exerted subtle—and not so subtle—social pressures on one another to conform to the hierarchy. He was able to make this insightful observation on what sociologists call "social control" because he had many opportunities to observe general and specific gang behavior and could adjust his observations to each situation.

Dynamic

As you look at people doing things, what you see changes: activities affect other activities; episodes take place. You get a glimpse of the role of time in the life of an environment: a mother leaning from her window calling her child to supper, the child coming. More complex chains of events are exemplified by a

hospital emergency room when an ambulance arrives. As Wiseman's perceptive documentary film *Hospital* (1970) shows, an ambulance arrival can have simultaneous effects on nurses, doctors, other patients, nearby staff members, police officers, and many others who participate, actively and passively.

In complex situations observers begin to get a sense of chain reactions: the effects of effects. No other effort gives a researcher so much of an idea of how people bring places to life. Ellis' (1974) explanation of "occasioning" among poorer Black people shows how they manipulate both behavior and time to cope with limited space. For example, although kitchens are predominantly associated with cooking and eating, residents might regularly use that room for other occasions: card parties, sewing bees, meeting the boys. Although "occasioning," according to Ellis, is a strategy used by poorer Blacks in the United States, observing behavior among other groups of people could test the hypothesis that they use the strategy as well.

When you observe behavior, you soon become aware of repetitive activities in identifiable places—what Barker calls "standing patterns of behavior" (1968). Place-specific activities within such a pattern are more closely related to one another than to patterns of activities in other places—for example, the set of activities in a drugstore connected to ordering, making, drinking, and paying for an ice cream soda are more closely related to one another than to those activities which constitute getting a prescription filled—although there may be no precise boundary defined between the two places where they occur. Training helps observers to identify sets of activities that are closely related to one another, to identify significant patterns, and to distinguish significant patterns from unimportant ones.

For example, in doing research on bank design, an observer might watch customers make bank transactions, from filling out slips at the desk to getting or depositing money at the window. It is easy to overlook parts of the sequence that occur before clients enter the bank or after they leave the teller's cage: seeing that documents are in their pockets and that money is safely put away into a purse. Does the security guard standing watch consider himself part of every transaction? To look carefully at events, observers continually question whether they see the whole event, whether they see all the participants, and whether something significant has been missed.

Observers in dynamic research situations can test their hunches on the spot. An observer who believes she has detected a regularity can try to predict what the next few persons will do and can revise or refine the hunch right away, depending on how these persons act. Instant feedback like this enables researchers in the beginning of a study to test many hunches, quickly identifying the more fruitful research ideas.

The more explicitly predictions and tests are made in notes and reports, the more you can use team members to check your interpretation. Writing down predictions and tests also helps observers avoid the trap of thinking that false

OBSERVERS' VANTAGE POINTS

Observers can choose to be outsiders or participants in any situation. As outsiders, they may be secret observers or recognized ones; as participants, either marginal or full.

Secret Outsider

The distant observer unobserved by participants in a natural setting is a secret outsider. Moore (1973) initially chose this vantage point for a study of children's play at an elementary school in Berkeley, California. School officials replaced half an acre of blacktop with dirt that children could dig in and objects to play with, such as timber, aluminum pipe, and tree stumps. For five months, every week at the same time, before, during, and after the change, Moore climbed to the roof of the school and recorded what the kids did, using time-lapse photography. He chose this vantage point so he would not alter their behavior with his recording equipment until he showed them the film and because he thought this would enable him later to analyze patterns of use. He found, however, that by choosing to record only an overview of the playground, he missed what individuals did over time and any indications of depth of personal involvement in what they did. To catch some of these dynamic attributes of his topic, he took the camera down to the ground, becoming a recognized outside observer.

Recognized Outsider

When Blau (1963, 1964) compared two job-placement offices, he introduced himself as a researcher to those who were to be observed, explained his study, and was given a desk by the department head to work at and observe from. A pitfall of such a recognized-outsider position is what is known as the Hawthorne effect—that subjects who know they are being observed as part of an experiment often change the way they act. The Hawthorne effect derived its name from the now-classic environmental experiments at the Western Electric Company's Hawthorne Plant in Chicago, where Roethlisberger and Dixon (1939) wanted to determine, among other things, how lighting levels affected workers' productivity. They carried out their studies as recognized observers. When they raised light levels, production increased. When they lowered light levels, production increased also. They concluded that consciously being under a microscope changes workers' behavior.

You can try to minimize the Hawthorne effect by spending enough time at your research site that people there get used to you and take you more for granted. Observers can develop tasks for themselves to do while observing so that people begin to see them as other people with something to do. Whatever observers do, there will always be the danger of some Hawthorne effect, which must be recognized and considered during data analysis.

starts have really been well tested and enables them to review their own work later with a clearer mind.

Variably Intrusive

Researchers have to decide how far they will intrude and from what social and physical vantage point they want to participate in observed events. At one extreme they can choose to record and observe behavior unobtrusively from a distance—for example, with a telephoto lens. In addition to possibly creating ethical problems, observing in this way removes the observer from the scene of action, depriving the method of a large part of its research potential. However, close participation increases the chance of unwittingly affecting the observed situation. Choice of vantage point depends on such things as research problem, available time, and investigator skills.

To offset research bias resulting from their presence, participant observers adopt social positions with which people are familiar. In a hospital, this could mean sitting in the waiting room like a patient; in a restaurant, working as a waitress or being a customer. To be able to take account in data analysis of changes they themselves induce, observers record any incident in which people may be reacting differently because the observers are present in their adopted position. For example, patients in a waiting room may be whispering because another patient (the observer) is waiting too. The more crowded a setting—for example, a rush-hour subway platform—the less observers' actions affect the situation.

Of course, intrusion may be part of the research project's design. For example, the observer has the ability to change situations and watch results, as Lerkowitz et al. (1955) did in their natural experiment, mentioned earlier, on pedestrians' reactions to differently dressed jaywalkers. Felipe and Sommer (1966) used themselves as both observer and stimulus to test a personal-space hypothesis that people get uncomfortable enough to leave if their personal-space norms are broken. Observers sat very close to students in a library and compared the time before the students left with the time before another student across the room moved, whose space was not invaded. The same natural-experiment approach to observing behavior can be taken by moving furniture, erecting signs, or changing an environment in some other way. Natural experiments are an example of artificial intervention made possible because observing behavior is such a variably intrusive research method. (The students next to whom Felipe and Sommer sat regularly moved away first.)

In sum, observing behavior is both empathetic and direct, deals with a dynamic subject, and allows observers to be variably intrusive. These qualities make the method useful at the beginning of research to generate hunches, in the middle to document regularities, and late in a research project to locate key explanatory information.

Another problem for recognized observers is that no matter how honestly and convincingly they present themselves, their study, and their ethical commitment to respect privacy, someone may not believe them. Observers can exacerbate this problem by oversight. Blau obtained permission to study the placement offices from the department head. The staff members therefore assumed that Blau would report everything he saw to their boss. This was a mistaken, but not surprising, interpretation. Observers need to avoid giving off clues that they are partisan watchdogs. They must remain as unaffiliated as possible by being careful about who introduces them, where they sit, whom they have lunch with, whose office they use to make phone calls from, and generally from whom they accept favors.

Sometimes you cannot help being a victim of natural institutional mistrust, particularly when you are interested in informal uses of physical settings. Welfare recipients with relatives staying over in the living room, students smoking in the school bathroom, teachers making private calls from an office phone, patrolmen resting in coffee shops between emergencies are worried about being caught by someone in authority. In such situations, subjects tend to fear that researchers are spies—perhaps tax inspectors or school administrators. Subjects normally play along with the “spy,” feeding him harmless information but not admitting the mistrust they feel. The more researchers explain their harmlessness, the guiltier they seem. To reduce the effects of mistrust on the validity of the research, observers must sensitively record situations in which mistrust is likely to have changed behavior. They can also make a special point not to ask questions about rule-breaking activity clearly irrelevant to the study problem.

Secret- and recognized-outsider vantage points both have disadvantages along with their advantages. Secret observers are by definition distant and removed from the action. Their position also raises ethical questions. Recognized observers may affect action in unknown ways.

Marginal Participant

Researchers who adopt the vantage point of a commonly accepted and unimportant participant want to be seen by actual participants as just another patient in a hospital waiting room, another subway rider, or another art student drawing in a park. A marginal-participant vantage point is a comfortable one for E-B researchers to adopt because observant professionals and laypersons adopt it naturally in daily situations.

Marginal positions that observers choose are likely to be somewhat familiar. We have all been bus passengers, members of the audience at a street concert, and restaurant patrons. Familiarity, however, can prevent observers from looking carefully at what is actually going on. It is tempting to assume that a quick glance will tell you everything because, after all, you have seen it all

before. Such an attitude dulls the observer's ability to be surprised by what she sees—an ability crucial if research is not merely to record the obvious.

An observer who is familiar with her vantage point can also be misled into assuming that she knows how others in a setting feel about *being watched*. For example, the marginal observer assumes when watching an informal football game in the park that he is taken to be a casual spectator. Meanwhile, the football players think he is a park attendant about to tell them to stop playing on the grass. To increase the validity of their research, observers must test their assumptions about how they are perceived by others. For example, observers can slightly change their natural behavior to see how people in the situation respond.

Ways to control unwanted side effects include deliberate choice of clothing, physical posture, and objects one is carrying. Researchers observing in Harvard Yard will be seen very differently if they carry green bookbags than if they carry leather attaché cases. One useful trick is to use one's behavior-recording device as a prop to indicate a familiar, yet inconsequential, participant position: camera for tourist, notebook for student, sketchbook for amateur artist.

In general, being a marginal participant observer requires the least amount of research preparation time. But precisely for this reason it requires that observers be introspective and self-aware.

Full Participant

To observe behavior, researchers can use positions they already are in and positions they adopt central to the situation they are studying. Full participants in a study of housing design might be residents of a neighborhood. A study to plan an office might be helped by researchers taking jobs as office clerks and typists.

Participant observation by a waitress would have been appropriate in an E-B situation described by Whyte (1949). In 12 restaurants in which tension was high between dining-room and kitchen staff members, he observed that when waitresses gave orders to the cooks in the kitchen, the cooks resented it. They were higher-paid and resented taking orders from less-skilled waitresses. Although they could not avoid communication flow in this direction, they could avoid taking orders directly. Tension was reduced when a clipboard was installed in some restaurants on the counter between dining room and kitchen. Waitresses put order slips on the clipboard. Whenever a cook decided to take the next order, he went to the board and picked up a slip. He put the plate back on the separating counter. He no longer took orders directly; the environmental change gave him control over his own actions.

In some cases researchers may not be able to choose full participation, as when all participants are highly skilled professionals (doctors in a hospital) and when membership in the setting being studied is restricted (men's athletic clubs). Gaining full participant-observer status by taking up residence, taking a job, or

joining an organization usually means making a long-term commitment. Return on investment potentially comes in the form of an insightful and empathetic position from which to gather behavioral data.

RECORDING DEVICES

Devices suited to recording behavior observations include verbal descriptions and diagrams, precoded checklists for counting, floor plans or maps, still photographs, and film or videotape. What devices to choose depends mainly on how much detailed information the problem demands and how much the observer already knows about the behaviors to be observed.

Notation

Recording behavior in verbal and diagrammatic notes demands that observers decide what to describe and what to overlook on the spot. For example, in describing how people use a hotel lounge, the observer must decide whether to record how people meet each other and move around, how people sit and watch others, how they hold their newspapers and shift their weight, how they move their eyes and twitch their noses. Each level of analysis is useful to design researchers for solving different problems. Each individual observer decides on and then isolates that level of analysis particularly relevant to his or her own study. If multiple observers work on the same research project, they must be trained and sensitized together, comparing their observations so that each knows what types of behaviors to note. That well-trained observers make decisions about levels of analysis can be an opportunity to see richness in a situation and catch that richness in discrete notes.

Procedures for descriptive behavioral notation are relatively simple. Notes are recorded by researchers working alone or by one team member when the other member is conducting an interview. As with notes of physical traces, it is useful to create a note page, creating a wide right-hand margin. When observations are written in the left-hand column, the right side is open for individual or group analysis. Table 8-1 shows a sample of field notes.

Table 8-1. Sample field notes from site visit to hospital emergency room. (Observations made from nurse's station at 1:00 p.m.)

<i>Observation</i>	<i>Comment</i>
Woman waiting in wheelchair has been waiting in corridor between nurse and row of examining rooms since at least 10:30. She is watching all the activity.	<i>Does watching emergency activity make waiting easier?</i>

Table 8-1 (continued)

Police arrive with stretcher. Announce in loud voices that they have a woman who fell down and passed out. She is lying still on stretcher with eyes closed, covered. All other patients sitting in corridor lean forward in chairs to look. The stretcher will not fit through corridor where patients are sitting. Police struggle to maneuver stretcher through the crowd of nurses and doctors in the nursing station to get to uncrowded corridor on other side. Patient is put in examining room. Curtain pulled part-way closed by last policeman to leave. Patients waiting in corridor have full view of patient in exam room.	<i>Why do they announce it? For nurses to clear a path?</i> <i>Patients looking again! Is it just something to do?</i> <i>Hallway waiting causes traffic problems for stretcher cases.</i>
A policeman wheels stretcher out back door into middle of waiting area, while another tells a nurse the details about the woman they brought in, leaning over counter at nurse's station.	<i>This probably bothers patients being examined.</i> <i>This public discussion surely seems like an invasion of privacy.</i>
Nurse leaves nurse's station, walks around counter into corridor, scans all patients waiting there. She walks up to one man who is seated, stands three feet away and tells him the results of lab tests and what they mean. Doctor walks over and asks same patient to go into exam room with him.	<i>Nurse in her "station" cannot see the informal or overflow waiting area in corridor. What are the design implications? Behavior of nurse in telling lab results is another type of invasion of privacy.</i>
Doctor's voice, shouting angrily, comes from an exam room.	<i>What acoustical control is needed in exam rooms?</i>
Doctor leaves nurse's station, approaches woman waiting in wheelchair, pulls up a chair, sits down beside her, and talks in low tones. Other patients sitting nearby watch and occasionally speak to each other.	<i>Consultation in waiting areas may be standard emergency-room procedure? Is there a way to allow this to take place but provide more privacy?</i>
Sound of friendly chatter, laughing from one exam room.	<i>Does this perhaps relax people in waiting area?</i>

Field notes by architect/researcher Polly Welch for "Hospital Emergency Facilities: Translating Behavioral Issues into Design," by P. Welch. (Graham Foundation Fellowship Report.) Cambridge, Mass.: Architecture Research Office, Harvard Graduate School of Design, 1977.

Several small tricks help avoid embarrassing mistakes in descriptive behavior notes: always include yourself in observations to avoid finding out that a crucial observed behavior actually was a response to the observer's presence; when sitting and taking notes in public, make a drawing on the top page of the notepad so that anyone who looks over your shoulder will find an acceptable sketch; never leave notes around. What to a researcher are harmless descriptions of the obvious, to participants can be highly insulting snooping.

Precoded Checklists

Descriptive notes provide a qualitative understanding of what is going on: what types of behavior patterns there are, what characteristics of participants are salient, and what level of descriptive abstraction is appropriate to solve a problem. If researchers want to know in greater detail how often an activity takes place, they can use qualitative observation data to develop a precoded checklist for counting. The qualitative approach serves in such situations as the diagnostic phase of the research project.

In their study of behavior on a psychiatric ward, Ittelson, Rivlin, and Proshansky (1970) recorded over 300 descriptions of behaviors during extended periods of time. For example, patient reclines on bench, hand over face, but not asleep; patient cleans table with sponge; patient plays soccer in corridor; patient sits on cans in hall watching people go by. For counting purposes, they coded the descriptions into categories representing types of activities observed, such as lying awake, housekeeping, games, and watching an activity.

For each activity on a checklist, observers record characteristics of participants (alone or in groups), place, time, and other relevant conditions, such as the weather. Perhaps the most significant task in developing a checklist is specifying the descriptive level of abstraction to record. Ittelson et al. decided, for example, that activity types (housekeeping, personal hygiene) were more relevant to their problem than activities were (cleaning a table with a sponge, setting one's hair). Rather than describe subjects in terms of approximate age, sex, weight, and height, which might be relevant to a study of children's play equipment, observers in the psychiatric ward coded sex of subject, whether acting alone or in a group, and, if in a group, of what size and sex mix.

To set up a checklist demands previous diagnostic observation, a thorough understanding of how the data will be used, and an understanding of how to develop coding categories. Once a precoded checklist is set up, it provides relatively comparable quantifiable data with only a moderate amount of training for observers.

Maps

Recording activities on floor plans, diagrams, or maps is particularly convenient if researchers want to observe and analyze several people in one general area at the same time: groups at a cocktail party, patients in a waiting room,

office workers eating in an open-air plaza. Looking at behavior recorded on maps can give investigators a better sense of how a whole place is used at once than looking at statistical tables.

Maps are also useful to record sequences of behavior in settings where people have a choice of several paths: from home to bus stop, from desk to desk in an open-plan office. Analyzing map records in the light of an actual setting can give an idea of the characteristics of popular paths.

If investigators want precise physical-location data, they can construct base maps with grids corresponding to regular elements in the actual setting, such as floor tiles or columns.

Photographs

Still photographs can capture subtleties that other methods may not record: the way someone sits on a chair or leans against a column; the way two persons avoid looking at each other by adjusting their body postures. In addition, as presented in Chapter 7, photographs are useful throughout a research project because of their illustrative quality. The same procedures hold for deciding on photographs to record behavior as were described for using photographs to record physical traces.

Videotapes and Movies

Whenever time is a significant element in an E-B problem, motion photography—videotape or movies—ought to be considered. For example, urban design of streets for handicapped and older people demands understanding their pace: how fast do they move, how long can they move before resting, how fast can they move out of other people's way? To design a safe escalator, it is essential to know how different types of people approach it, prepare to get onto it, and embark (Davis & Ayers, 1975).

WHAT TO OBSERVE

Observing behavior looks like a simple E-B research technique. Everyone watches people every day. Doesn't everyone know how to do it? In a way, yes; but few know what to look for and how to analyze what they see so that it is useful to design.

Designers make places for people to do things in—either alone or together with other people. A structure for looking at environmental behavior useful to designers results in data to help physical designers make decisions that improve places for people. The better information designers have about how the people they design for behave in physical settings and how those people relate to or exclude other people, the better they can control the behavioral side effects of the design decisions they make.

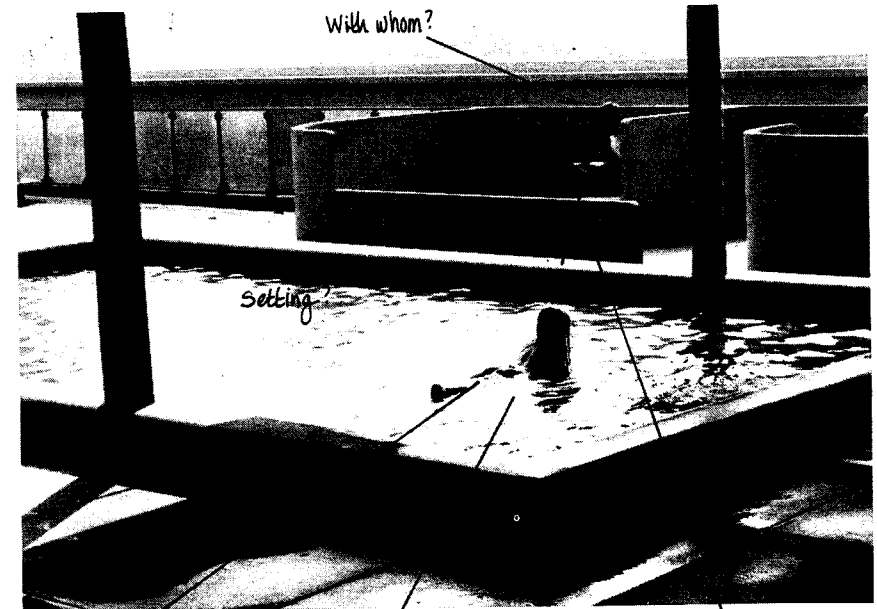
But that is not enough. Designers must also know how the contexts of observed activities affect the activities, because in different sociocultural and physical settings the same behavior can have different design implications. For example, children may do homework at the kitchen table for different reasons in a house with several available rooms to study in than in a one-bedroom apartment where four people are living. In some groups people react to neighbors sitting on the front stoop with disdain, while for others the front rather than the back is where everyone sits.

When you structure the way you look at something, you replace complex reality with a simpler version to guide your reactions and action. To increase our control over the behavioral side effects of design decisions, we can describe behavior in terms of actor, act, significant others, relationships, context, and setting (see box).

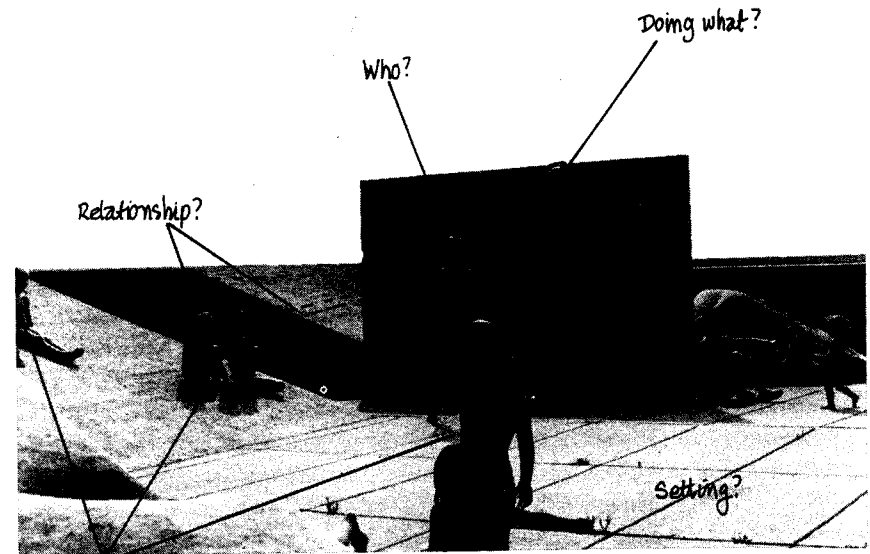
Elements in Environmental Behavior Observation	
Who is	<i>Actor</i>
doing what	<i>Act</i>
with whom?	<i>Significant Others</i>
In what relationship,	<i>Relationships</i>
	aural, visual, tactile, olfactory, symbolic
in what context,	<i>Sociocultural Context</i>
	situation culture
and where?	<i>Physical Setting</i>
	props spatial relations

The following illustrations are verbally annotated to show how you can use these observation categories to describe environmental behavior in actual situations.

Each observation comprises a relationship between an actor and a significant other to which the physical setting in some way contributes.



Swimming pool and sitting area on roof of Le Corbusier's Marseille Block Housing, Marseille, France



Children watching girl play ball on roof of Le Corbusier's Marseille Block Housing, Marseille, France

Who: Actor

The subject of a behavioral observation, the "actor," may be described in numerous ways, depending on the purpose of the description. Designers can use research in large design projects to better understand similarities and variations among types of people. For example, instead of designing a school for 273 unique individuals, a designer can use research to differentiate the needs of students, teachers, principals, and maintenance workers. Nursing homes can be planned for patients, nurses, doctors, maintenance crews, and visitors; furniture can be designed for the range of people who work in offices. In a sense, individuals in observations are treated as representatives of a social group.

We can use individuals as such representatives by describing a person's social position or status: age status, marital status, educational status, professional status, and so on. It helps to be complete in observations if we describe both a person's ascribed statuses (the characteristics that a person has automatically, such as sex and age) and his or her achieved statuses (those that the person had to do something to get, such as finding a job, graduating from college, getting married, or inviting people to a party). Many positions are defined as part of a relationship to others: party hostess (guests), wife (husband), teacher (student), nurse (patient), salesperson (customer).

An observer unable in field notes to describe statuses accurately can describe clues from which he and other researchers reading the notes may be able to infer status. For example, Snyder and Ostrander, in their Oxford nursing-home study (1974), observed people who were patients, family members, visitors, and staff members. After a few days they knew most individuals personally or could infer their status from such things as dress (uniform means nurse; bathrobe means patient) and tools (stethoscope means doctor; sitting in wheelchair means patient). But when they were not sure, they described in their field notes whatever clues they had and whether they were guessing about the person's status. It is better to record "It could be a nurse's aide resting in the wheelchair" than to write "It is a patient asleep in the corner," so that other researchers can help evaluate the data.

Sometimes relevant descriptions of actors in behavioral observations are names of groups—teens, teachers, girls—not individuals. In Zeisel's property-damage study (1976a) researchers observed groups of boys playing street hockey and stickball in open spaces around schools. It was not important for their research and design problem to identify each street-hockey participant as an actor in a separate act. Researchers treated the group as the actor, describing the group's size and composition. Groups can be described in the same status terms as individuals. For example, the psychiatric ward study by Ittelson et al. (1970) identified groups by the number of male and female patients, doctors, and visitors they contained.

One pitfall for observers to avoid is subsuming significant individuals under general group descriptions. If four teenagers are shooting hockey pucks at

the front doors of a school while five others look on from a bench nearby and one gets ready under a tree to play, it would be misleading to write in one's field notes: "A group of ten boys are playing street hockey at the school entrance." To design a place to play street hockey, the relationship among players, spectators, and reserve players is relevant.

A group of two also raises problems for observers: are they a group acting together with common significant others, or do they themselves represent actor and significant other for each other? If they are very similar and are doing the same thing, it may be appropriate to describe them together: two boys playing street hockey with each other, two elderly men playing chess, two women walking down the street together. However, when the couple is made up of two different types of individuals interacting, it may be useful to describe them separately, seeing one of the two as the actor in the observation: parent and child in the park, nurse and patient in a hospital. But even here, as with all descriptive observation techniques, the researcher's judgment is the most significant determinant of what is important to describe.

Doing What: Act

The people you observe will be doing something. An observer needs to decide the level of abstraction he will use to describe behavior and how he will distinguish individual acts from a connected sequence of acts.

The level of description observers choose depends mainly on the design and research problem facing them. Let us take as an example an observational study to write a behavioral program for a shopping-center design. Observers could describe very generally that some people there are "shopping" and others are just hanging around. More precisely, they can describe that some shoppers browse, while others buy something. Or observers might record where and count how often a supermarket patron stops in the aisles. Observers might record how high patrons reach and how low they stoop when getting items off the shelves. Or observers might go to the trouble to observe and record in what direction patrons turn their heads and focus their eyes while walking down the aisle. Each observation is either interesting or useless, depending on the problem researchers are trying to solve. The series of design questions in Table 8-2 shows how each level of described activity might be useful.

Along with deciding on appropriate levels of analysis, researchers must explain how the acts they describe relate to one another. In the sequence of acts called "shopping," a person prepares a shopping list, leaves home, goes to the store, looks at items in the store, reaches for them, examines them, walks down the aisle, pays at the cash register, returns home, and unpacks. Each of these can be seen as a discrete act linked to the others as part of a larger "shopping" sequence. If researchers observing behavior maintain clarity of descriptive level

Table 8-2. Behavior descriptions and corresponding questions for a shopping-center design, by level of detail

	<i>Behavior Observation</i>	<i>Design Question</i>
General Description	"Shopping" as opposed to "hanging around"	In a shopping-center plan, how many places are needed for people to hang around, and how can they be designed to augment rather than interfere with shopping?
	Shoppers browsing as opposed to buying something	How should items be displayed so that browsers and buyers can see them but buyers have greater access to them?
	Where and how often shoppers stop in supermarket aisles	How can flooring materials, lighting, and aisle length be designed for maximum convenience to customers, maximum exposure of sales items, and minimum maintenance?
	How high patrons will reach and how low they will stoop	What shelf design and what product placement (what size container on what shelf) will ensure that customers have the easiest time reaching items?
Detailed Description	Where customers' eyes focus while moving down an aisle	Where should standard signs be placed to convey the most information, and where ought sale signs be located to catch customers' glances?

and completeness in describing related acts, they will be able to analyze their data more easily.

I have stressed the skill that observers need to decide how and what to describe. It is equally important that they have the ability to describe what they see with minimum interpretation. Well-recorded observations leave ample time and space for analysis after data have been collected. If observers try to interpret what they see before writing it down, they run the risk of recording interpretations rather than description, losing the data for good. The data cannot be retrieved to be analyzed by others or reviewed later. If data on behavior are to be sharable, it is vital that observers record "a smiling person," not "a happy person," because a smile can mean many things.

With Whom: Significant Others

Acts people engage in are partly defined by how other people are or are not included. Other people whose presence or absence is significant in this way can be seen as participants in the act itself. Girls for whom boys playing street hockey show off make the activity what it is. If they were not there, it would be another situation. The same is true in reverse for studying alone in the library. Those who are not there—friends, roommates, strangers—contribute to the situation by their absence. To understand and present what is going on, descriptions of girls watching the boys and of absent roommates must be included in research observations of behavior.

"Significant others" are especially important in environmental design research because so many design decisions about adjacencies, connections, and separations have side effects for relationships. To continue one of our earlier examples, boys playing street hockey need a hard, flat surface to play on. If this surface is provided for them in the middle of a deserted field far from other activity, it is unlikely to be used, because the "significant others," the girls and passers-by, have not been taken into account. A tot lot with no places for parents to sit and watch may go unused in favor of a more convenient one or will be used in a different way than the designer had hoped.

The positions or statuses by which actors are described often have standard role relationships associated with them. In a family, for example, one finds role relationships between parent and child, sister and brother, husband and wife, grandparent and grandchild. In hospitals there are role relationships between doctor and patient, doctor and nurse, patient and nurse, patient and visitor, nurse and visitor, patient and patient. A sensitive researcher observing a doctor making notes in a hospital will use the concept of significant other to direct attention to the relationship the doctor making notes has set up between herself and patients, nurses, and other doctors. Does she sit among patients in the waiting room, or does she retire to a private lounge? Does she discuss notes with nurses or just hand them in? To design appropriately for notetaking in hospitals, the answers to these relational questions can be important.

Relationships

Between actors and significant others in a situation there will be specific relationships for observers to describe. In extreme cases relationships can be described simply: "together" (two lovers on a park bench at night) or "apart" (a prisoner in solitary confinement).

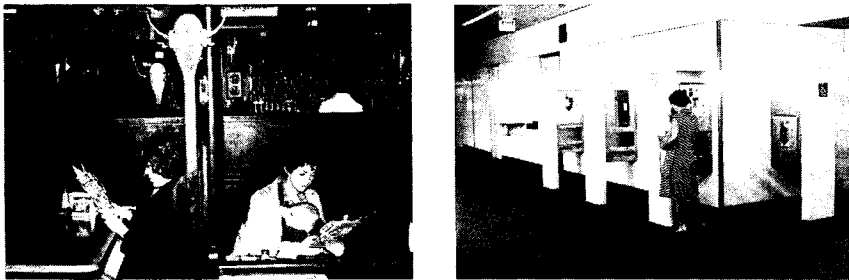
Most E-B relationships, however, are not so simple. Are two persons talking to each other through a fence together or apart? What about two persons sitting back-to-back in adjacent restaurant booths? The problem researchers face is to systematically describe relationships like these so that differences and simi-

larities between two situations are clear. Then researchers and designers can use the information to develop broader strategies for design rather than continually approaching each situation as totally new. To gather such information, researchers need to agree on a set of categories to describe connections and separations between people, and they must understand how the effects of relationships on activities differ in different behavior settings.

Hall (1966) shows us that behavioral connections and separations between people in environments can be conveniently and efficiently described in terms of four physiological senses and a symbolic perceptual dimension: seeing (visual), hearing (aural), touching (tactile), smelling (olfactory), and perceiving (symbolic).

Describing two people as completely together, or “copresent” (Goffman, 1963:17), means that, like two children in the bathtub, they can see, hear, touch, and smell each other, and they feel that they are “in the same place.”

When we move away from extreme relationships, the sensory terms we have for describing relationships enable us to discriminate among and compare various types and also to begin to identify the role that the physical environment plays in relationships between people. A mother on the third floor calling to her child playing on the street is connected visually and aurally but is separated in terms of touch, smell, and perception. Two students studying at opposite ends of a long library table are separated symbolically and in terms of smell and touch but are connected visually and aurally. Persons in an L-shaped living room, around the corner from someone cooking in the kitchen, are separated by sight, touch, and perception but are connected in terms of food smells and sound.



Simultaneous connections and separations

When observers see and can describe relationships like these, they try to find out what the relationships mean to participants. Although they must use other research methods as well to determine meaning, behavior observation provides clues to meaning. The clues are the ways people react when other people talk to them, touch them, and so on.

Context

People react to other people differently in one situation than in another and differently in one culture than in another. It is as if they filtered what they saw through a series of screens—situational and cultural. The screens are usually used unconsciously, as Sommer (1969) and Hall (1966) have pointed out. People assume that other people see things the same way they themselves do. It is the observer’s job to identify how people’s situational and cultural screens are constructed—how they interpret their own and others’ behavior.

This is particularly important in environmental design research because the meanings people attribute to relationships determine how they react to environmental features, such as walls, doors, and lights, that affect those relationships.

Situations. A person’s sitting alone and apart from others, facing a wall in a library, probably means she wants to be left alone to read or study. In a bar, this same physical behavior can be interpreted as an invitation for conversation (Sommer, 1969). The person might still reject the advances, but she is unlikely to be distressed and insulted, as the person disturbed in the library may be.

An extreme example of how a situation can influence the meaning people attribute to behavioral relationships can be seen if you watch people’s shocked reactions when you talk in a normal voice to a friend over the hush in a crowded elevator. In a department store, a market, or a crowd viewing a parade, your voice would not even be noticed. In an elevator, however, the definition of personal space is different, and so are the definitions of unacceptable behaviors. An observer must try to understand the situational rules being applied by participants to interpret the meaning they attribute to even a simple observation such as “Two persons stood next to each other talking.”

Culture. Cultural context also influences how people interpret and react to behavioral relationships. For example, Hall (1966) reports that in England sitting alone reading in a room at home with the door open means “Do not disturb; do not even knock.” In the United States you would close your door to indicate you wanted to be alone; an open door means you are available. It would not be inappropriate for people to knock on an open door and ask whether they might come in. An interior designer laying out open offices in these two cultures needs to be aware of these differences if he wants to control the behavioral side effects of his physical design decisions.

It is particularly important to record cultural contexts for behavior when you carry out observational studies in another country, in ethnic neighborhoods, or in parts of your own country with strong regional differences. Otherwise, designers using your data will be making decisions irrelevant to users. As in Le Corbusier’s Chandigarh, people may end up cooking on stoves on the floor in efficiency kitchens and establishing illegal street markets in the plazas in front of

modern government buildings (Brolin, 1972). To see behavior from a cultural perspective other than one's own requires general observation and study of another culture, awareness of one's own cultural biases, and at times requesting members of or experts on another culture to help interpret behavioral data once they are collected. As the basis for this interpretation, it is necessary to describe as fully as possible people's reactions to relationships they find themselves in.

Setting

The meaning of behavior in a particular setting depends on the potential of the setting for use—the options it provides (Gans, 1968). If people in an airport waiting lounge are sitting on the floor surrounded by empty seats, their behavior may have a different meaning than if no seats are available. Understanding participants' choices and possibilities to act helps you interpret what they finally choose to do.

Behavior potentials of settings. *Objects* imply obvious options for use: seats in telephone booths are for sitting down when calling, bathroom sinks for washing hands. At the same time they have a host of less obvious latent implications limited only by users' physical capabilities, daring, and imagination. The telephone seat provides tired noncallers a place to rest. Sinks in school bathrooms often fall off the wall because they are sat on by teenagers taking a cigarette break between classes. On a hot summer day urban fountains turn into swimming pools. These objects can be seen as *props* for behavior.

Elements that divide and connect places organize potentials for behavioral relationships. The glass walls, closable doors, acoustic paneling, and corner placement of a phone booth provide users with the option for acoustical and physical privacy but not visual privacy. The visual privacy school bathrooms provide enhances their suitability for taking cigarette breaks.

Relational design decisions. *Barriers* clearly determine potentials for relationships between people in settings. Barriers include walls of various materials and consistencies, screens in different sizes and materials, objects used to mark the edges of places, and symbols from color changes to verbal signs. Design decisions defining *fields* in space influence behavior relationships less obviously. Field definitions include such characteristics of places as shape, orientation, size, and environmental conditions—sound, light, air.

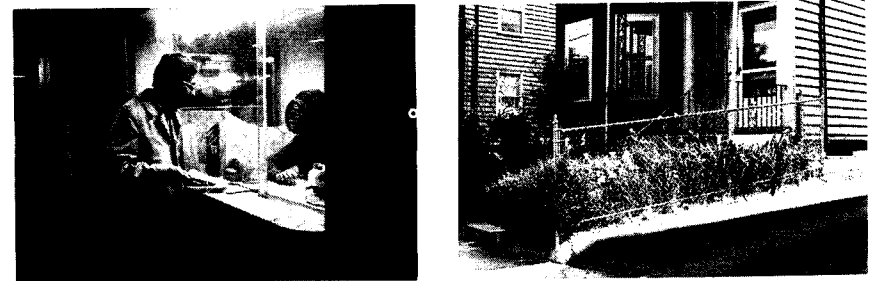
To define the ways these physical characteristics affect relationships between people, we can use the simple relational scheme developed earlier: seeing, hearing, touching, smelling, and perceiving.

Barriers. Barriers are physical elements that can keep people apart or join them together on one or more of the five dimensions—seeing, hearing, and so on. As one progresses from walls to symbols, barriers become more permeable.

Walls separate people in places. The absence of walls allows people to be connected. The thickness, consistency, and materials of walls influence the

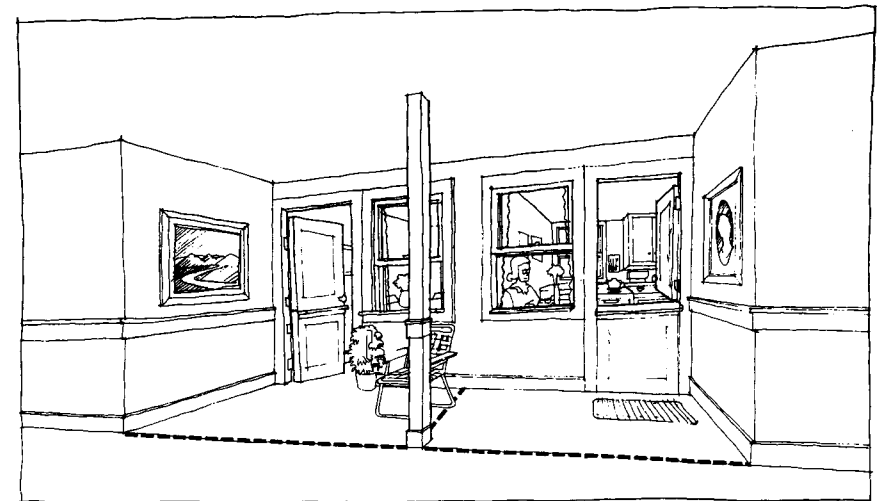
quality of separation. For example, walls with no soundproofing between bedrooms provide neighbors with aural opportunities (and inhibitions) that denser walls do not.

Screens—glass panels, a garden hedge, a shower curtain, doors, counters, windows—separate and connect people more selectively than complete walls. Glass can enable visual connection but tactile separation; a shower curtain, the opposite. Materials can be combined to provide different degrees of connection and separation along any mix of dimensions. Screens can also be designed to give selective control over the screen to users. For example, the lock and bell on a glass-paneled house door provide a range of permeability options for family members, friends, and thieves (Hoogdale, 1977).



Screens

Objects form another class of barriers. Things placed in space may be perceived as space dividers or connectors: a piece of sculpture on a public plaza as a separator or as a place to meet; a couch in a living room; a tree in a garden.



An object, here a column in a shared interior porch, can help people divide space perceptually. (Congregate House for Older People. Design-research team: Barry Korobkin, John Zeisel, and Eric Jahan. Donham & Sweeney, associated architects.)

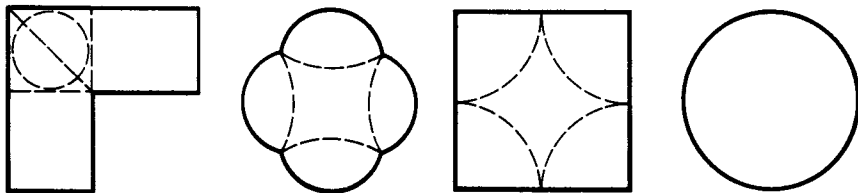
Finally, *symbols* can be barriers. Color changes in the rug around a public telephone and change in ceiling height in a room signal that someone considers this space to be two separate places, perceptually.

Depending on how people interpret spatial symbols, they may change their behavior: not walking too close to the phone caller because of the floor color, calling one part of a room by another name because of the shift in ceiling height.

Symbols can also be overt signs: "Do Not Walk on the Grass" potentially keeping people off; "Open for Business" potentially bringing people in. Sitting on the grass near a "Keep Off" sign conveys another impression to observers than if there is no such separator.

Fields. Field characteristics of an entire place can alter people's ability to be together or apart. Field characteristics do this not by standing between people, like barriers, but by altering the physical context within which visual, aural, tactile, olfactory, and perceptual relationships take place. Field characteristics of places include their shape, orientation, size, and environmental condition.

The *shape* of a setting affects primarily visual and perceptual relationships. If people want to, they can use the cues that shapes provide to consider areas within one space as separate places. Corners in a square area, for example, can be more easily seen as separate from one another than parts of a round place can. In a study of children playing in different rooms, groups of children quickly claimed as distinct territories the places in the leaves of clover-shaped rooms (Hutt, 1969).



L-shape separates space visually and symbolically

Shape suggests perceptual separations

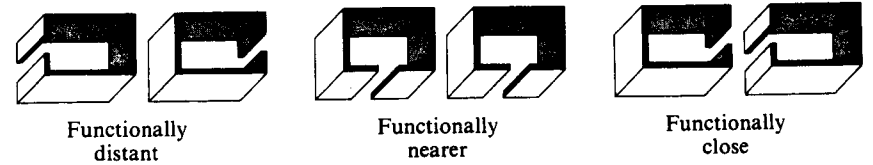
Corners suggest potential symbolic separators

Round shape connects parts

Effects of shape

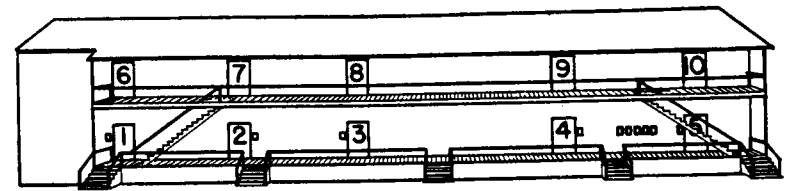
Orientation of one place to another influences the behavioral relationship between people in them. Two places oriented so that people using them have a higher chance of casually seeing or meeting one another may be considered "functionally" closer than two equidistant places oriented to minimize chance encounters (Festinger et al., 1950).

Festinger et al. found that this concept helped explain why certain pairs of neighbors regularly liked each other better than other pairs, although both sets of apartments were the same distance apart. Apartments 1 and 6 and apartments 2 and 7 (see diagram below) are exactly 53 feet apart. The location of the left-hand



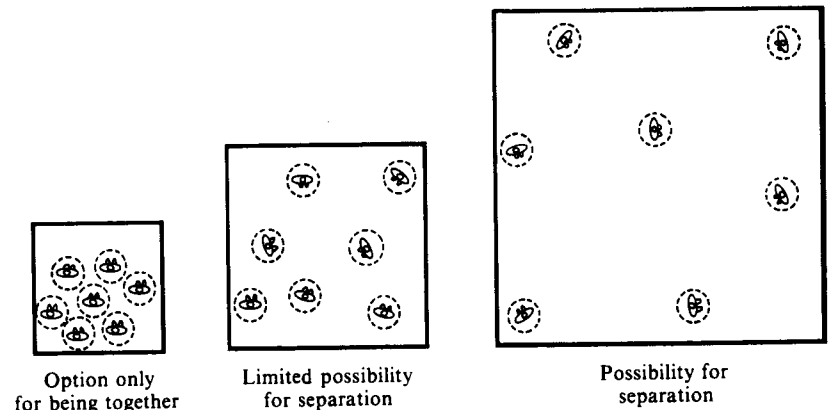
Degrees of functional distance

stairway forces residents of apartment 6 to pass apartment 1 whenever they come or go. But people living in apartments 2 and 7 can leave home and return without ever running into one another. As the hypothesis of Festinger et al. leads them to expect, residents in the functionally closer pair, 1 and 6, selected one another more often as friends than did residents in apartments 2 and 7.



Schematic diagram of a building in Festinger's dormitory study. (Reprinted from *Social Pressures in Informal Groups*, by Leon Festinger, Stanley Schachter, and Kurt Back, with the permission of the publishers, Stanford University Press. Copyright 1950, renewed 1978 by the Board of Trustees of the Leland Stanford Junior University.)

Possible distance between people is a major determinant of potential behavior relationships. The *size* of a setting offers opportunities for people to put distance between themselves or limits their options. A 4-meter-square conference room does not offer any of seven participants at a meeting the option to separate



Option only for being together

Limited possibility for separation

Possibility for separation

Degrees of setting size

from the rest of the group. In the main hall of New York's Grand Central Station, the same people could easily be dispersed.

Loudness, light intensity, and air flow are *environmental conditions* that directly affect possibilities for behavior relationships by limiting and augmenting people's ability to hear, see, and smell other people and activities. For example, light turned low in a restaurant effectively separates people at different tables as if there were a physical screen between them. A single worker in an open-plan office listening to a radio at high volume acoustically invades the space of other workers and separates himself from them aurally. Machines that emit high-pitched sound and mask background noise without participants' awareness protect acoustical privacy as a closed door might. An exhaust hood and fan over a kitchen stove keep kitchen smells out of adjacent rooms—olfactorily separating people cooking in the kitchen from others.

OVERVIEW

To design environments suited to what people do in them, we must understand environmental behavior: *Who does what with whom? In what relationship, sociocultural context, and physical setting?* This chapter proposes that by looking at how environments affect people's ability to see, hear, touch, smell, and perceive each other, we can begin to understand how environments impinge on social behavior.

Environmental elements that affect relationships include barriers, such as walls, screens, objects, and symbols; and fields, such as shape, orientation, size, and environmental conditions. Design decisions about these elements have identifiable side effects for social behavior.

Environmental-behavior descriptions that can enable designers to improve control over behavioral side effects of their decisions include six elements: actor, act, significant others, relationships, context, and setting.

The next three chapters discuss how to find out about people's feelings, attitudes, perceptions, and knowledge—namely, by asking questions.

Chapter 9

FOCUSED INTERVIEWS

Asking questions in research means posing questions systematically to find out what people think, feel, do, know, believe, and expect. Normally when we think of an interview or a questionnaire, we think of the yes/no or multiple-choice questions of most public opinion polls. But such questions are fringe forms of a research tool of potentially much more penetrating power. You can use a focused interview with individuals or groups to find out in depth how people define a concrete situation, what they consider important about it, what effects they intended their actions to have in the situation, and how they feel about it. Originally formulated to tap reactions to films of military instruction and propaganda, radio broadcasts, and other mass communication devices, focused interviews are particularly suited to the needs of environment-behavior researchers interested in reactions to particular environments. Many of the concepts this chapter explains and the way it explains them are based on Merton, Fiske, and Kendall's insightful and inventive book *The Focused Interview* (1956).

PREINTERVIEW ANALYSIS AND INTERVIEW GUIDE

To understand thoroughly how someone reacts to a situation, one must first analyze the structure of that situation, using theory and observational research methods. This analysis can then be used as the basis for discussing the situation in detail with the respondent. Such a situational analysis guides the discussion; the interviewee's responses are used to test, refine, and modify the analysis. A skilled focused interviewer negotiates with a respondent to find correspondence between his own analytic structure and the respondent's mental picture of the situation. By structuring the information themselves, focused-interview respondents become participants in the research.

The *interview guide* is a loose conceptual map, such as a family might draw up before taking a cross-country camping trip. It lays out major sights to see, places to stay, and so on. After the trip begins, the family members find some of the sights closed, others uninteresting, others so arresting that they stay longer than expected. They also find that they do not drive as many miles as planned each day and that the children like to stop to eat more often. Every day they adjust their plans, and they end up having a fine trip that mixes the plans