PART I
INTRODUCTION

1

AN APPROACH TO ENVIRONMENTAL DESIGN

Environmental-design research

The subject of this volume is a particular approach to environmental design and planning, the decision-making processes that shape the physical forms of our rooms, buildings, communities, and nations by influencing what people build and how they act in the physical environment. In all its various forms, this approach is distinguished by the explicit consideration it gives to the needs and preferences of the people who are destined to use those physical settings.

For a very long time, people have relied on the good judgment or good taste of trained professionals who are delegated the authority to make design and planning decisions for them. Those designers and planners differ widely in the attention they give to the needs of everyday users of the physical environment. Some fulfill their professional obligations by concentrating on the use of the technical expertise they have acquired, including their knowledge of materials, structural stresses, and traditional devices for solving the problems left to them. According to the well-known architect Philip Johnson, for example, "the job of the architect is to create beautiful buildings; that's all" (Sommer, 1976, p. 4).

Such an approach may be sufficient to please the designer's or planner's clients, especially if they defer to a great reputation such as Johnson's, but it seems to give little consideration to the needs of the building's users, especially if those needs go beyond aesthetics to such concerns as finding their way around the building, having enough privacy at their workstations, or being comfortable in their surroundings. Fortunately, some design and planning professionals do recognize and attempt to serve the needs of users. Another noted architect, Mies van der Rohe, designed a headquarters building for the Seagram Corporation in New York City in 1958. In front of that building, he designed a small public plaza consisting primarily of two rectangular pools bordered by low, broad, flat-topped stone walls. Those walls became such a popular place for office workers and passersby to sit, watching people and eating their lunches, that they provided William H. Whyte with the inspiration and the initial opportunity to study systematically the determinants of the use of such public spaces, leading to an eventual decision to revise the city's zoning laws to require developers to construct public plazas that people would be likely to use and enjoy (see chapter 9).

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Over the past several decades, environmental-design researchers have grad-ually introduced what seems a surer method of taking user needs and prefer-ences into account in design and planning decisions. It *requires* decision makers to raise questions about the needs and preferences of prospective users, to seek verifiable answers to those questions, to incorporate features based on those answers into the final design or plan, and then to evaluate the resulting physical setting for the degree to which the targeted user needs and preferences are actually satisfied.

This new approach to environmental design and planning has been charac-terized in many ways by practitioners and analysts. Holahan and Wandersman (1987), stressing the role of physical settings in helping people to reach specific goals, have used the phrase "proactive intervention" to describe the process of user-needs-based design. Moore (1987) has suggested that design be defined "in the broadest sense, [as] the application of knowledge [gained through research] to the solution of real-world problems in the everyday physical environment" (p. 1,383). Sommer (1974) has described an evolution-ary design process in which, instead of building, for example, all the needed classrooms or prison cells at one time, a small number will be built, and then evaluated, and the results of the evaluation will be incorporated into the design for the next batch, and so on. And, finally, Osmond (1970) has sug-gested as a model for environmental design and planning the airplane de-signer's motto: "Draw 'em, build 'em, test 'em, fly 'em, scrap 'em."

Whatever definition or analogy or combination one chooses, the important point is the contrast between environmental-design research and the tradi-tional authoritative approach to design and planning that it seeks to replace. First, the behavioral needs of users are made explicit, their dependence on the physical setting is determined objectively, the eventual design or plan incor-porates physical or policy elements that are identified in the course of that determination, and the efficiency of the design or plan is evaluated system-atically, with the results being fed forward into subsequent design or planning decisions. It is the purpose of this volume to describe and evaluate the past accomplishments, present status, and future prospects of environmental-design research through detailed examination of specific design and planning projects in which it has played a prominent role.

The case-study approach

The original goal of this book, simply put, was to publicize the contributions that environmental-design research has made to environmental design and planning. In teaching environmental psychology, I was struck by the lack of emphasis in textbooks on actual applications of the theories, research results, and research techniques that had been documented in such great detail. Long chapters on theories and research findings either contained brief mentions of

relevant applications or ended with separate brief sections describing exam-
ples of applications. That presentation was in stark contrast to my own view
that those applications constituted the most exciting aspects of the field,
because of their actual impact on places and on people's lives (evident even in
the brief descriptions provided), and because of their value as the ultimate
tests of the validity of generic theories and research findings. For both those
reasons, they seemed to deserve much more attention than they had received.

None of this is intended to deny the value of gaining knowledge for its own
sake. Basic research and theory have made significant contributions to our
understanding of environment–behavior relationships and will continue to do
so. Some would go so far as to argue that basic research and theory ultimately
have made possible applications such as those described in this volume. On
the other hand, it seems just as clear that basic research and theory cannot
simply be transposed onto specific environmental settings by designers or
planners. Therefore, the importance of applications seemed to warrant sepa-
rate and detailed consideration.

The plan for accomplishing that goal was to present detailed case studies of
actual applications or projects. That approach was chosen for several reasons.
The first was the belief that the application of knowledge about environment–
behavior relationships in environmental-design research is a process in which
the local context or the setting for which design or planning decisions are
being made must be taken into account. Whereas theories or research findings
might be applicable to a variety of settings and might be used as the basis for
generic guidelines for classrooms, college dormitories, or jails, a successful
design or plan must also take into account the specific history, climate, and
population of the setting in which it is to be implemented. Detailed case
studies of environmental-design research (EDR) applications for specific set-
tings are more likely to make that point clear than are less detailed reviews of
EDR applications for categories of settings, if that is in fact the case.

Historically, there has been a well-known division of opinion on this issue.
In a series of articles published in the *Personality and Social Psychology
Bulletin,* Irwin Altman (1976a,b) argued for the development of general theo-
ries of environment–behavior relationships, and Harold Proshansky (1976)
maintained that theory-building research, particularly when carried out in
context-free laboratory settings and with a truncated temporal perspective,
may produce generalizations about environment–behavior relationships that
fail to take into account influential sociohistorical characteristics of the spe-
cific settings to which practitioners may wish to apply them. In agreement
with Proshansky's view, Schneekloth (1987) has made a strong argument for
the uniqueness of each application or intervention based on environment–
behavior theory or research. A designer, she also pointed out that each project
takes place in a specific context, subject to the operation of diverse constraints
on users' behaviors, including their personal characteristics and those of envi-

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ronmental decision makers, sociohistorical factors, and organizational poli-
cies.

Again, I do not wish in any way to deny the possibility of developing generalizable theories or empirical relationships that could inform design or planning decisions. Yet it still seems important to consider EDR projects on a case-by-case basis so that the role of the local context can be evaluated. And in the collection of cases presented here, project-specific research was a far more common source of environment–behavior knowledge than was general theory or research.

A related reason for adopting the case-study approach concerns the value of applications to specific settings in the process of building and evaluating theories of environment–behavior relationships. Although analyses of the EDR process typically focus on the flow of information from theory and research to application (design or planning), the relationship between the two areas is actually reciprocal. Although some argue that setting-specific an- alyses can hinder the development of generic data-based (scientific) theories, the argument can also be made that applications can add invaluable data to the theory-building process. Given the methodological problems inherent in all behavioral research (cf. Campbell & Stanley, 1966), where trade-offs between realism and freedom from artifact often leave disturbing residual questions about both, the fact that applications of theory and data can be shown to be successful in operation through empirical evaluation, under conditions where methodological artifacts are unlikely and relevant context is restored, should add greatly to one's confidence in the generalizations that underlay the design or plan in question.

An excellent example of the reciprocal relationships among research, the- ory, and application is provided by the work of Newman (see chapter 11). It began with an interest in the environmental determinants of crime in New York City public housing. The bare empirical relationships discovered in that specific setting provided the basis for a limited version of the theory of "defensible space" that was applied successfully in the redesign of the Clason Point Gardens housing project (chapter 11). At the same time, the theory was elaborated and extended, partly through the use of new data from private neighborhoods in St. Louis. The more elaborate theory provided the basis for design and planning decisions in varied types of settings, both residential and nonresidential, as well as for a large body of empirical research designed to test the theory itself.

A further reason for choosing case studies over reviews of categories of cases was to enhance the impact on the reader in order to further the original goal of this volume, namely, proselytization. Brief descriptions of applica- tions, such as those found in most environmental-psychology textbooks, are not able to convey to the reader the importance of the problem being ad- dressed, the ingenuity with which data and theory are brought to bear on that

problem, or the importance of the final design or planning solution to the lives of those who use the setting in which it is implemented. A chapter-length case study, on the other hand, permits an adequate description of the setting, the problem, the programming and design process (including the use and/or generation of useful behavior theory or research), and the results of any evaluation of the subsequent use of the setting, to make the aforementioned points clear to the reader.

Many analyses of the status of environmental-design research have pointed to a gap between environment–behavior research, on the one hand, and design and planning practice, on the other, that is blamed for inhibiting applications of knowledge about environment and behavior from reaching their true potential. The magnitude of that gap is evident from the fact that most environmental-design activities taking place today do not benefit noticeably from available or obtainable knowledge about environment–behavior relationships. In my correspondence with Michael Bakos about the work of his firm Architecture-Research-Construction (ARC), I was fortunate to obtain his eloquent summary of the current state of environmental-design research (M. Bakos, personal communication, February 20, 1989):

It is too simplistic to say that designers/architects work with pictures and researchers work with words. Over and again . . . I have seen architects skip over the theory and insight of an architectural program to go straight to the square footage listing – "how big do you want the room" is the concrete level at which they are comfortable. There is of course "informal" design happening today, but all too rarely. If the field of environment–behavior research can be said to have failed, it would be in the lack of impact on so much of what is designed today. Whether it be daycare centers, the office environment, schools, playgrounds, hospitals, prisons or the workplace, too much is designed with conventional wisdom and without the benefit of research or evaluation.

One means that has been suggested for closing that gap is greater exposure of successful applications, to convince all of the parties concerned of the potential value of utilizing environment–behavior research and theory to inform design and planning decisions. In a special issue of *Environment and Behavior* devoted to assessing the contributions of environmental and behavioral research to design (Kantrowitz & Seidel, 1985), several authors stressed the importance of increasing people's knowledge of successful applications (Kantrowitz, 1985), of *more effective* dissemination of environment–behavior theories and research (Seidel, 1985), and of providing *evidence* of the benefits of using environmental-design research (Shibley, 1985). As if to add emphasis to the point, one author (Seidel, 1985) reported that as far as he knew, "no attempts at fully instrumental [directed to a specific project] research use have been tried" (p. 52). The need for greater communication of the potential of environmental-design research was also stressed in an earlier report on the

status of the field published under the auspices of the American Institute of Architects (Dudik & McClure, 1978).

A selection of case studies may not indicate the overall extent to which environment–behavior theory and research have been applied to planning and design, but these cases do emphasize the degree to which such applications have influenced specific design and planning projects and, in some cases, the benefits that have accrued to clients and users. There is reason to believe that this is a more effective approach to communicating the potential of environmental-design research. Psychological research in the area of human judgment processes indicates that people's judgments about causal relationships, such as the impact of environment–behavior knowledge on the quality of design and planning decisions, may be influenced more by memorable details of specific cases, such as those described in this volume, than by statistical evidence of a relationship that might emerge from a review of the entire body of such cases (Hamill, Wilson, & Nisbett, 1980).

The selection of cases

When this project began, prospective cases were to be evaluated against the following stringent set of criteria, not unlike those proposed by Wener (1982):

1. The goals for the design or plan placed significant emphasis on users' needs.
2. The relationships between design or plan features and users' needs were evaluated on the basis of behavioral research or theory.
3. Recommendations based on that research or theory were incorporated explicitly in the final design or plan.
4. The completed project included those recommended design or plan features.
5. The impact of those features on users of the affected setting could be estimated from an empirical evaluation of user behavior.

The first three criteria were used throughout the selection process, with the minor exception that the definition of behavioral research was broadened to include any form of empirical evaluation of the likely impact of design or planning decisions on users of the setting (e.g., in chapter 14, research on the shadowing effects of different locations or designs for high-rise buildings in San Francisco was used to formulate recommendations for zoning controls, on the assumption that the predictable shadowing of public spaces would influence pedestrian comfort and the likelihood of use of the affected space).

The last two criteria were revised substantially along the way. It became clear in the course of investigating prospective cases that the process by which behavior-based recommendations were incorporated into the final design or plan for a project, following negotiation with other interests (financial, aes-

thetic, etc.), was an important phase of environmental-design research that
could be illuminated as well by cases where behavioral needs were among the
losers in such negotiations as by cases where they were among the winners.
For example, the results of the study comparing the legibility of alternative
floor-numbering systems for a new hospital building had only limited impact,
because a contract had already been signed to purchase elevators with elec-
tronic displays of floor numbers that would not accommodate the designations
found to be the most legible (see chapter 4).

Finally, several projects were included despite the fact that no formal eval-
uation of their success in supporting targeted user behaviors had been carried
out. One of those projects was too recent to have been evaluated, and the
others accurately reflected the overall low frequency of such evaluations.

The decision to alter some of the selection criteria en route was influenced
by the need to add further criteria whose importance became evident during
the selection process. After reviewing the documentation for many prospec-
tive cases, it was decided that if the collection was to fairly represent suc-
cessful cases of environmental-design research, it was important to in-
clude projects in a variety of setting types (e.g., interior spaces, buildings,
communities, scenic areas), projects that utilized a variety of sources of
environment–behavior knowledge (e.g., mainstream theories and research
findings, project-specific surveys of potential users, comparisons of simulated
design alternatives), and projects that provided historical perspective on the
field (in addition to providing opportunities to evaluate long-term impacts)
and displayed the contributions of key figures in its history (e.g., Robert
Sommer, Donald Appleyard, Oscar Newman).

In brief, the initial goal of the selection process was to assemble a collec-
tion of ideal cases. That goal was changed to the presentation of cases that
were successful on their own terms and that provided a basis for understand-
ing the process of environmental-design research through their representation
of the existing variety of settings, behavioral needs, and research approaches,
as well as the problems that competent, even exemplary, practitioners are
likely to encounter. It was decided, finally, that the development of the field
would be furthered more by a realistic picture than by an idealistic portrayal of
the current state of the art. This direction is also consistent with the view that
this volume is not primarily a source of facts that can be used in research or
planning or design, but rather a source of process that can be applied to the
combination of research and planning and design that is environmental-design
research.

The selection process was also influenced by a variety of practical consider-
ations. As has been pointed out by some of those who have cited the need for
greater publicity for successful EDR projects, documentation of such work
can be difficult to obtain. For example, in editing a special issue of *Environ-
ment and Behavior* on applications of environment–behavior research, Kan-

trowitz and Seidel (1985) intended to devote the entire issue to case studies, but failed in their attempt to assemble a collection of cases. Although some cases have been described in academic journals such as *Environment and Behavior* and the *Journal of Architectural and Planning Research,* and others in professional periodicals such as *Progressive Architecture* and *Landscape Architecture* (usually brief descriptions in "awards" issues), detailed reports are more difficult to obtain. They are often considered proprietary information. That is, the reports are written for environmental-design researchers' or designers' clients, and they are not published because the client who has paid for the work feels entitled to be the exclusive beneficiary of the results of it, or even because the researcher or designer is pressed to concentrate his or her efforts on activities that can be billed to a client. This is not as likely when the client is in the public sector (e.g., a government agency), but even in those cases such reports often are not published, but are made available only to a small circle of colleagues known to the authors. It has been my experience that practitioners differ greatly in their willingness to share such information with academicians or others with an "interest" in it. Some are eager to help and/or to have their work publicized, whereas others seem unwilling to respond no matter how earnestly or how often they are asked.

   Thus, the collection of cases in this volume is to some extent what social-science researchers call an opportunity sample. There are other cases that meet the criteria for inclusion and would have been valuable additions to the collection, but they have proved to be inaccessible. There may be others that remain completely unknown.

Description and analysis

At the outset, this volume was intended to present cases of successful environmental-design research in a purely descriptive fashion. To a large extent, that plan was predicated on the assumption that such a mode of presentation would make the material more accessible to the broad audience for which the book was intended. Although some design practitioners and other interested parties are trained in the behavioral or social sciences and understand (even relish) the methodological and statistical technicalities of research in those fields, others are trained principally in the design professions, where such matters may appear arcane or even obfuscatory.

   In discussing this project with Irv Altman and Dan Stokols, the editors of this series of books, I became convinced that by avoiding analysis I would do an injustice to the field to which I was so committed and to the readers with whom I was so concerned. Around the same time, reading John Zeisel's *Inquiry by Design* (1981) convinced me that my own training as a social scientist had left me ignorant of the importance of analyzing the design process as well as the research methods for each case.

For these reasons, the plan for presenting the cases was changed from that of pure description to that of description and analysis. To accommodate the needs of readers whose backgrounds had not acquainted them with the basic principles of both social-science research and the design and planning processes, it was decided to include an introductory chapter (chapter 2) that would describe briefly the underlying principles of each form of analysis (research methods and design processes) and thus provide the reader with a conceptual model of the analyses to be found at the end of each case presentation.

Contribution to the field

The ultimate goal for this volume remains the same as it has been from the first, despite the numerous changes in format that have been made along the way. It seems clearer now than ever that both the potential and the actual contributions of environmental-design research to design and planning have been greatly underestimated and understated, even by those who are intimately involved in the work and strongly committed to its success. It is gratifying to be able to state with confidence today, after several years of reading about these projects, discussing them with participants and clients, and visiting the sites of many around the country, that the field of environmental-design research has already influenced in a positive way the lives of millions of people around the world and that the work that has been done already provides a firm foundation for even greater progress in the future. It is to be hoped that telling the story of some of these accomplishments will add in some small way to that progress.

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