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HANDBOOK OF
ENVIRONMENTAL PSYCHOLOGY

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PREFACE

The relationships between people and their everyday environments received only sporadic attention from behavioral scientists prior to the mid-1960s. However, several circumstances converged during the late 1960s to move environment–behavior research from the background to the forefront of social science. Concerns about environmental degradation and urban violence, shortages of natural resources, and the impacts of environmental pollution on health increased sharply during this period. At the same time, behavioral scientists had few theoretical or methodological guidelines for studying the psychological, performance, and health impacts of these complex environmental problems. Owing to this heightened awareness of community–environment crises and the existence of major scientific gaps in our understanding of these problems, the multidisciplinary field of environment and behavior expanded rapidly after 1970. During this period, psychologists and their colleagues from several related disciplines embraced the challenge of developing new scientific approaches for studying human behavior and well-being from an interdisciplinary and ecological perspective.

Between 1970 and 1980, several coherent paradigms of environment–behavior research emerged, focusing on topics such as personal space, crowding, and territoriality; environmental attitudes and assessment; spatial cognition, resource conservation, and behavior settings analysis; individuals' reactions to environmental stressors; small group ecology; and the influence of urban and cultural factors on the vitality of neighborhoods and community groups. New theoretical and methodological approaches evolved within each paradigm, and the rapidly growing body of empirical findings spurred the establishment of new journals, professional organizations, and conference series, as well as the publication of several textbooks and monographs in environmental psychology and related areas of environment–behavior research.

We first considered the possibility of editing a *Handbook of Environmental Psychology* during the fall of 1980. The potential usefulness of such a volume was suggested by the rapid growth of the field, by the uniqueness and increasing coherence of the field's conceptual, methodological, and empirical directions, by the international scope and practical significance of environment–behavior research, and by the prospects for continued growth and scientific innovation within environmental psychology and the broader environment–behavior field. Considering these trends, we concluded that the development of this volume could prove valuable in several respects.

First, we wanted to develop a comprehensive volume that would offer a representative and detailed overview of environmental psychology in terms of its major theoretical, methodological, and empirical contributions. Equally comprehensive coverage of the field is typically precluded by the space limitations of review articles and the more restrictive focus of research monographs.

Second, we wanted the *Handbook* to highlight novel directions of inquiry and to identify recent and prospective linkages among diverse research paradigms. As of the early 1980s, several integrative or "cross-paradigm" research programs were underway. By emphasizing the integrative and interdisciplinary aspects of the field, we hope that this volume will facilitate future progress toward conceptual and methodological integration within environment–behavior research.

Third, considering the applicability of environment–behavior concepts, methods, and findings to the analysis and resolution of community problems (e.g., resource conservation, facilities design, health promotion), we wanted this volume to reflect the previous and potential contributions of environmental psychology to community planning and public policy. Part 4 of this volume, for example, provides a valuable sourcebook for practitioners interested in applying psychological perspectives to a broad range of community–environment problems. Thus the *Handbook* is oriented not only toward researchers and graduate students in environmental psychology, but

xi

133

also toward a broad spectrum of environmental practitioners and professional groups, including architects, interior designers, facilities managers, natural resource managers, transportation analysts, urban planners, and health care providers.

Fourth, in view of the increasingly international scope of environmental psychology (as reflected in the establishment of international organizations, journals, and conference series for the support and dissemination of environment–behavior research), we wanted this book to highlight the distinctive theoretical and methodological perspectives that have evolved within various countries and regions of the world. Thus Part 5 of the *Handbook* is devoted to an analysis and comparison of environment–behavior research developments within ten different countries or geographical regions. A comparison of the scientific perspectives presented in these chapters reveals the striking influence of geographic, political, and cultural forces on the directions of environment–behavior research.

Fifth, we wanted this volume to trace the scientific–historical context in which environmental psychology evolved and the ecological and demographic trends that are likely to influence the course of future research. Thus the first section of the *Handbook* focuses on the social and intellectual origins of environmental psychology while the last explores several potential directions for future research in this field. In addition, all of the chapters in other parts of the volume describe the historical development of specific research areas and examine potentially important directions for future work.

These five major goals guided our assumptions about the selection and sequencing of chapter topics and about the overall organization of the book. (The organizational assumptions and structure of this volume are discussed in greater detail in the Introduction.) The structure and development of this volume also was guided by the insightful and expert advice offered by 35 of our colleagues in environmental psychology from around the world, who served as members of the Editorial Board for the *Handbook*. These individuals were asked to comment on our prospectus for the *Handbook* and to provide suggestions regarding the selection of chapter topics, authors, and

the general themes to be emphasized within each part of the volume. In developing the initial prospectus for the volume and in the reviews of authors' chapter outlines, we were assisted by Edwin Willems of the University of Houston and through our discussions with Thurman Poston at John Wiley & Sons. In subsequent stages of the *Handbook's* production, we received invaluable assistance from Herb Reich, Valda Aldzeris, Sheck Cho, and Michael Flaherty at John Wiley & Sons. The complex and incremental process of developing the *Handbook* over the past seven years was greatly facilitated by the gracious and competent assistance we received from the editorial and production staff at John Wiley & Sons.

The planning and eventual production of the *Handbook* was very much a collaborative effort and we are deeply grateful to the numerous individuals who have assisted us throughout all stages of the project. We thank the members of the Editorial Board, who provided extremely detailed and constructive reviews of chapter outlines and chapter drafts. We also appreciate the dedication and persistence of chapter authors, who painstakingly prepared their manuscripts and graciously responded to the suggestions of the editors and additional reviewers in preparing the revised and final versions of their chapters. Our respective universities (the University of California, Irvine, and the University of Utah) provided us with continuing assistance in the form of staff support, facilities, and sabbatical leave during the period in which we edited this volume. We thank Fran Renner, Jill Vidas, and Carol Wyatt for their able assistance in typing various sections of the manuscript. And last but not least, we want to thank our wives, Jeanne and Gloria, and our children, Eli, David, and William, who provided support and encouragement throughout the seven years that we worked on this project.

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INTRODUCTION

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Environmental psychology, or the study of human behavior and well-being in relation to the sociophysical environment, emerged during the 1960s as the result of both scientific and societal concerns. At the societal level, increased awareness of community problems such as overcrowding, the shrinkage of natural resources, and the deterioration of environmental quality prompted widespread concern about the constraints of the ecological environment. Yet as psychologists turned their attention to the study of the relationships between the large-scale physical environment and behavior they encountered several conceptual and methodological issues that had been left unresolved by the mainstream of behavioral science. Most important, traditional psychological theories had neglected the molar physical environment while focusing more narrowly on the links between microlevel stimuli and intrapersonal processes such as perception, cognition, learning, and development. Theoretical and methodological guidelines for charting the ecological context of behavior remained to be established. Thus the environmental dilemmas of the 1960s and 1970s and the scientific agenda posed by these problems facilitated the coalescence and rapid growth of environmental psychology.

The rapid expansion of environmental psychology during the past decades is reflected in the appearance of numerous textbooks and research monographs, the establishment of new journals (*Environment and Behavior,* 1969; *Population and Environment,* 1978; the *Journal of Environmental Psychology,* 1981; *Journal of Architectural Planning and Research,* 1984), and the development of several professional organizations (e.g., the Environmental Design Research Association and the environmental sections of the American Psychological Association, American Sociological Association, and the International Association of Applied Psychology). The *Annual Review of Psychology* now incorporates chapters on environmental psychology at regular intervals. Since 1973, four such chapters have appeared (Craik, 1973; Holahan, 1986; Russell & Ward, 1982; Stokols, 1978). Moreover, the increasingly international scope of the field is evident from the recent professional meetings that have been held in Australia, Ecuador, France, West Germany, Great Britain, Israel, Japan, Mexico, the Netherlands, the Soviet Union, the United States, Turkey, Venezuela, and Scandinavia, and the establishment of graduate training programs in environmental psychology at universities around the world.

Sheer quantity of publication and the vigorous level of professional activity within environmental psychology were not in themselves sufficient reasons for developing the present handbook. This volume, the first large-scale compendium of knowledge on environmental psychology, is warranted only to the degree that these indications of quantitative growth coincide with evidence of the scientific maturity, practical utility, and future viability of the field.

SALIENT FEATURES OF ENVIRONMENTAL PSYCHOLOGY

Our objective in developing a comprehensive, scholarly *Handbook of Environmental Psychology* was closely linked to four major features of contemporary research on environment and behavior. First, the high levels of research and professional activity, noted earlier, have yielded substantial scientific achievements. An earlier review of the field concluded that:

1

Environmental psychology is no mere fad of the 1960's—a short-lived product of environmentalist and political activism. Instead, this field has taken hold both conceptually and empirically and is now comprised of several active and focused research domains....The scientific vitality of environmental psychology is reflected in the substantial theoretical and empirical progress that has been made within many of its major subareas. (Stokols, 1978, p. 278)

Second, recent research indicates an increasing emphasis on theoretical integration and coherence. Progress toward conceptual and methodological integration is reflected in the linkages that have been drawn between various research paradigms within the field (e.g., the combination of environmental cognition and operant perspectives in the analysis of energy conservation and community use of public transit systems; applications of behavior-setting analysis to issues of environmental assessment, human development, and stress). Moreover, several programs of research reflect novel lines of inquiry, the results of which may contribute to a clearer delineation of the unique, theoretical underpinnings of the field.

Third, the accumulation and consolidation of scientific knowledge have been accompanied by several effective applications of environment–behavioral research to issues of community planning and environmental design. The development of certain research areas within environmental psychology (e.g., environmental assessment, environmental stress), in fact, reflects a direct response to applied concerns. The community problems orientation and proven practical utility of environmental psychology are among its most distinctive and desirable features.

Fourth, prospects for the continued vitality and viability of environmental psychology are favorable. On the one hand, environmental psychologists have discovered several engaging scientific questions within diverse areas of the field that are likely to stimulate new theoretical, methodological, and empirical advances in the years to come. At the same time, the persisting (and in many instances worsening) environmental dilemmas of the present and future decades should provide an additional impetus for the continued development of the field.

Furthermore, owing to the complexity of environmental problems and the necessity of approaching them from different perspectives and levels of analysis, contemporary research on environment and behavior is interdisciplinary in scope. Researchers and practitioners in the fields of geography, urban sociology, public health, natural resources management,

architecture, organizational behavior, facilities management, and urban planning constitute a broad base of professional support for environmental psychology. In view of the interdisciplinary orientation of the field, it is likely that these scholarly and professional groups will continue to collaborate with psychologists in the analysis of community problems and to utilize the conceptual and methodological tools of environmental psychology.

ORGANIZATION OF THE HANDBOOK

The six sections of this volume, true to the nature of the field of environmental psychology, are not organized around neatly circumscribed, nonoverlapping content areas. Possible analogies for the organization of chapters and sections include a mosaic of overlapping but distinctive units, a pattern of somewhat inseparable parts, a multidimensional figure that can be viewed from any of several perspectives, or a series of overlay maps, each of which contains different qualities of the terrain. As such, there are many ways to approach the material in this volume, and the organization of chapters and sections could have taken any of several forms.

It might be best to imagine the volume as a series of cartographic maps, each of which describes different qualities of a geographic region. One traditional form of map emphasizes highway and road routes; another describes terrain configurations and contours; another depicts vegetation and climatic conditions; another focuses on distributions of agricultural products and mineral resources. Each map is incomplete in respect to the whole, but each is valid in relationship to its specific focus. This volume can be seen to reflect a series of overlapping maps, and one can proceed through the volume on any of several "intellectual journeys."

The requirement to produce a single map bound between hard covers results in only one representation of the field of environmental psychology when, in fact, it is possible to work through the volume using any of several paths or maps. Following is our "guide" to the handbook through several of its organizational maps.

The visible organization of the volume is reflected in its Table of Contents and six sections. Briefly, Part 1, "Origins and Scope of Environmental Psychology," traces the societal and intellectual origins of environmental psychology, the scientific structure of the field, and recent theoretical and methodological trends.

Parts 2, 3, and 4 contain chapters that focus on the conceptual and empirical substance of the field, albeit from different perspectives. One can treat these sections as reflecting a three-dimensional matrix. A major focus of the chapters in Part 2, "Processes of Person–Environment Transactions," is basic psychological processes such as cognition, personality, emotion, life-stage development, and territoriality as they relate to people's day-to-day transactions with the large-scale environment. Here, authors examine the major research paradigms of environmental psychology and the psychological processes emphasized within these areas. Individual chapters review important theoretical, methodological, and empirical developments within particular research areas. Authors also were invited to deal with unresolved theoretical and methodological issues, potentially fruitful lines of inquiry, and the practical significance of previous and current work within their topical area.

A second dimension of these chapters deals with the environmental contexts or settings in which psychological processes are embedded such as homes, neighborhoods, educational settings, medical treatment centers, recreational areas, and work environments. Thus, Part 3, "Levels of Environmental Analysis: Situations, Settings, and Places," focuses on various categories and scales of environments and the psychological processes embedded in those settings. The study of places (and the psychological processes manifested in places) is a unique hallmark of environmental psychology, and the chapters of this part deal with some of the more heavily researched environmental settings.

A third facet of research in this field concerns environmental change, intervention, and a broad range of applications. In Part 4, "Applications of Environmental Psychology to Community Problems," psychological processes and environmental settings are examined from the perspective of a problem solving and action–research orientation. Thus the chapters of Part 4 deal with potential applications of environmental psychology to community problems such as crime prevention, depletion of natural resources, pollution, inefficient public transit systems, urban stress, and environmental degradation. Chapters examine instances in which psychological theory and/or research methods have been utilized in the analysis and amelioration of environmental problems. Authors also discuss factors influencing the effectiveness of collaboration among environmental researchers and practitioners and the development of criteria for judging the cost-effectiveness of alternative community interventions. In summary, Parts 2, 3, and 4 form a diverse yet overlapping set of chapters, each adopting a different focus on the fundamental subject matter, research and theory of environmental psychology.

Part 5, "International Perspectives on Environmental Psychology," is a unique approach to the subject matter of the field. Environmental psychology is not only an interdisciplinary field; it is international in scope. Given its substantive concerns, the theories and research problems of environmental psychology are intimately linked to local cultural and physical circumstances. Because of the vigorous and energetic international activity in this field we decided to include a set of chapters that explicitly examine trends in environmental research and theory in different parts of the world. These chapters also portray the historical, cultural, and geographical factors associated with the development of environmental psychology around the world.

Part 6, "Prospects for the Future," contains chapters by pioneers in environmental psychology. Authors were invited to present their views of the field—its history and prospects for the future, as well as a retrospective and prospective look at their own work. These chapters capstone the volume and are based on the contributions of those who have participated in and observed the field for over three decades.

Embedded within the volume are a number of themes and topics, analogous to the multiple maps of a geographical region. Following are some thematic guidelines for various intellectual trips through the complex region of environmental psychology.

How does one gain a sense of the history of the field? Environmental psychology is too new and too diverse to expect a singular, standardized, and all-encompassing chapter on the history of the field, as one might find in a traditional textbook or handbook. For that reason, and because we think it is important to place contemporary work in perspective, we asked authors to include some historical background in their chapters. Thus almost every chapter includes some form of historical commentary.

The international chapters of Part 5 are especially rich in historical perspective, and one might begin with this cluster of contributions. The philosophically oriented chapters of Part 1 all adopt a historical perspective on the development of the field, as do the chapters of Part 6 by pioneers in the field. And the chapters of Parts 2, 3, and 4, focusing on psychological processes, settings, and applications, respectively, usually place their subject matter in historical

perspective. Because there was no way to achieve a single all-encompassing history of the field, we asked all authors to address history from the perspective of their topical area.

How does one obtain an overview of the subject matter of the field? Here again, one will find such information in all chapters. But the best starting point is the chapters of Parts 2, 3, and 4. These chapters deal with research and theory on psychological processes, physical settings, and applications, respectively. If one is interested in particular places, then one should begin with the chapters of Parts 3 and 4 and then trace back into the chapters of Part 2, which deal with psychological processes. If one is interested primarily in fundamental psychological processes, one should begin with the relevant chapters of Part 2 and then work through the chapters of Parts 3 and 4. And, to round out one's view of subject matter, it will be helpful to examine parts of the international chapters of Part 5, because they deal with research and theory on psychological processes, settings, and applications in particular regions of the world. Also, some substantive research is discussed in the first and last parts of the volume, albeit from historical, theoretical, methodological, and philosophical perspectives.

How does one gain a sense of the future of environmental psychology and opportunities for promising directions of research and theory? Here too, the diversity of the field did not permit a single chapter or two on this topic. Instead, we asked each author to conclude his or her chapter with an analysis of potentially fruitful directions for future research and theory. Proposals for further research consistently appear in the main substantive chapters of Parts 2, 3, and 4, which address research and theory on psychological processes, places, and applications of environmental psychology. The chapters in Parts 1 and 6, which address broad philosophical, historical, and methodological issues, also contain many suggestions for future research, as well as projections of the future directions of the field.

How does one explore methodological issues of environmental psychology? Here we pursued a mixed strategy. In Part 1, "Origins and Structure of Environmental Psychology," Chapter 3 by Winkel is devoted specifically to methodological issues. The other chapters in Part 1 also deal with methodological questions at a broad strategic level, as do the chapters in Part 6, "Environmental Psychology: Prospects for the Future." We also asked authors in all of the other parts of the volume to include issues of research methodology in relationship to their topics, as appropriate.

Forty-three chapters, written by authors from different parts of the world, dealing with a multidisciplinary and overlapping subject matter that can be approached from several vantage points and perspectives, cannot possibly yield a singular and simplified representation of the field. Although we editors have attempted to coordinate the diverse material presented in this handbook, the sheer volume and diversity of material made it impossible to avoid some overlap and redundancy across individual chapters. We trust, however, that the richness and comprehensiveness of the material, the enthusiasm and competence of the authors, and the untold possibilities for new and exciting research in environmental psychology will help foster the continued scientific vitality and societal contributions of this field.

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CONCEPTUAL STRATEGIES OF ENVIRONMENTAL PSYCHOLOGY

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2.1. INTRODUCTION

In Chapter 1, Altman and Rogoff traced the historical development of four philosophical world views within psychology: trait, interactionist, organismic, and transactional perspectives. They suggest that, while trait and interactionist analyses have received most attention to date, recent work reflects an emerging trend toward the development of organismic and, particularly, transactional models of behavior. Altman and Rogoff conclude their chapter with the following cautionary note:

> The lure of the transactional approach is simultaneously coupled with a sense of uncertainty. How does one build a theory of holistic, changing phenomena? What methods can we use to study phenomena at a holistic level? How do we incorporate change and temporal factors as part of psychological phenomena? (p. 37)

These questions pose an ambitious but promising agenda for future work in environmental psychology: namely, *the translation of a transactional world view into operational strategies for theory development and research.* Whereas some researchers have characterized environmental psychology as a "problem-centered rather than theory-centered set of activities" organized around the solution of community problems (Darley & Gilbert, 1985, p. 949), it is clear that much of the work in this field has focused on more basic theoretical tasks such as the development of new concepts and methods for understanding the ecological context of behavior and the transactions between people and places (cf. Barker, 1968; Holahan, 1986; Ittelson, 1973; Stokols, 1983; Winkel,

41

Chapter 3, Wapner, Chapter 41, this volume). Future elaborations of this work may well succeed in achieving the kind of comprehensive scientific expression of transactionalism called for by Altman and Rogoff, Barker, Wapner, Winkel, and others in the environment and behavior field.

A fundamental feature of transactional research is its emphasis on the dynamic interplay between people and their everyday environmental settings, or "contexts." This chapter offers certain conceptual strategies for organizing *contextual* theorizing and research. It should be noted at the outset that this chapter does not review the numerous theoretical paradigms that have emerged within the field of environmental psychology over the past two decades; comprehensive coverage of these developments is provided in Section 2 of this volume. Rather the chapter focuses on some of the more general, metatheoretical issues that are inherent in the development of contextually oriented analyses of environment and behavior.

2.2. EMERGENCE OF A CONTEXTUAL PERSPECTIVE IN PSYCHOLOGY

During the 1970s and early 1980s, a growing interest in contextualism occurred within several areas of psychological research. Psychologists within every major area of the discipline noted the deficiencies of decontextualized research and called for more holistic and ecologically grounded approaches to the study of behavior. In the fields of clinical, biological, and health psychology, for example, Schwartz (1982) proposed a *biopsychosocial* view of health and illness, which replaces "single-cause, single-effect" models with those that address the complex interactions among physiological, psychological, and social dimensions of well-being. Similarly the volumes by Magnusson and Allen (1983) and by Wapner and Kaplan (1983) call for holistic approaches to the study of human development and are part of an ever widening stream of ecologically oriented research in developmental psychology (cf. earlier discussions of this research by Bronfenbrenner, 1979; Scarr, 1979). Within the fields of cognitive, personality, and social psychology, the volumes by Gergen (1982), Kaplan and Kaplan (1982), and Neisser (1982) and the articles by Georgoudi and Rosnow (1985), Kelley (1983), Little (1983), McGuire (1983), Smith (1983), and Veroff (1983) are indicative of an increasing trend toward contextual analyses of cognition and social behavior. Altman (1982), in his Presidential Address to the Di-

vision of Population and Environmental Psychology, contended that we are in the midst of a full-fledged scientific revolution across all areas of psychology, involving a shift from unidirectional, mechanistic analyses of environment and behavior toward transactional and contextually oriented models. Little (Chapter 7, this volume) has referred to these developments as the "contextual revolution" in psychology.

The terms *ecological* and *contextual* are certainly not new to psychologists. Explicit concern for the ecological context of behavior was evident in the writings of Koffka (1935), Lewin (1936), Murray (1938) and Tolman and Brunswik (1935), during the mid-1930s and in the subsequent work of Barker (1968), Chein (1954), Gibson (1960), Jessor (1958), and Kohler (1947). But the emergence of areas such as population, community, and environmental psychology during the sixties and seventies signaled a surge of interest in ecological issues that in recent years has begun to pervade more established areas of the field as well (cf. Barker & Schoggen, 1973; Craik, 1973; Fawcett, 1973; Heller & Monahan, 1977; Kelly, 1985; Proshansky, Ittelson, & Rivlin, 1976; Russell & Ward, 1982; Saegert, 1985; Sarason, 1976; Stokols, 1978a).

The current popularity of contextual approaches in psychology appears to be rooted in both societal and intellectual developments. At the community level, concerns about global population growth, resource shortages, and environmental decay have increased the salience of ecological constraints on behavior. And, at a more academic level, the growing emphasis on contextual theorizing and research in psychology can be viewed as part of a conceptual shift within the behavioral sciences away from exclusively intrapersonal explanations of behavior, toward those that encompass not only the immediate social environment but also the broader cultural, historical, and geographic milieu of people's day-to-day activities (cf. Cronbach, 1975; Gergen & Gergen, 1984; Manicas & Secord, 1983).

Whatever its sources and the differences in terminology that surface among its proponents, the contextual perspective in psychology seems to be associated with certain widely shared core assumptions. Among these assumptions are: (1) that psychological phenomena should be viewed in relation to the spatial, temporal, and sociocultural milieu in which they occur; (2) that a focus on individuals' responses to discrete stimuli and events in the short run should be supplemented by more molar and longitudinal analyses of people's everyday activities and settings; (3) that the search for lawful and generaliza-

ble relationships between environment and behavior should be balanced by a sensitivity to, and analysis of, the situation specificity of psychological phenomena (cf. Cronbach, 1975; Gergen, 1973); and (4) that the criteria of ecological and external validity should be explicitly considered (along with the internal validity of the research) not only when designing behavioral studies but also when judging the applicability of research findings to the development of public policies and community interventions (cf. Brinberg & McGrath, 1985; Cook & Campbell, 1979; Winkel, Chapter 3, this volume).

While there have been much discussion about the virtues of contextualism and some agreement about its general assumptions, considerably less progress has been made in translating these assumptions into more specific guidelines for theory development and empirical research (for notable exceptions to this trend see Barker & Schoggen, 1973; Bronfenbrenner, 1979; Little, Chapter 7, Wicker, Chapter 16, this volume). Lest contextualism become an empty buzzword, several difficult questions must be addressed. First, what are the distinguishing features of contextual theorizing and research? *Specifically, what features differentiate a contextual analysis from a noncontextual one?* Second, are psychological research questions differentially suited to a contextual approach? That is, *for which psychological phenomena is a contextual analysis warranted and for which is it not?* And, third, in those instances where a contextual perspective is adopted, what criteria determine the scope and content of the variables included in the analysis? *What particular considerations should guide the researcher's decisions about how broadly to draw the contextual boundaries of a phenomenon, and which concepts and methods to use in analyzing the relationships between the phenomenon at hand and the specific contexts in which it is observed?*

The complexity of these questions suggests the value of adopting a more systematic approach to contextual theorizing than has usually been taken What has been lacking in earlier studies of environment and behavior is a set of programmatic guidelines for contextual theorizing and research. As an initial foundation for establishing this more systematic approach, the following sections of the chapter outline certain distinctive features of contextual research and offer a set of dimensions for mapping important sources of situational influence on behavior. The proposed dimensions include the spatial, temporal, and sociocultural scope of an analysis; the integration of objective and subjective perspectives on environment and behavior; the use of both individual and aggregate levels of analysis; and the

partitive or composite representation of situations. Taken together, these dimensions provide a framework for developing contextual theories, or those that account for the cross-situational variability of psychological and behavioral events.

The construction of psychological theories is often regarded as a strictly intuitive matter rather than as a process that can be systematically described and enhanced. Furthermore many researchers contend that efforts to develop behavioral theories are best postponed until a substantial body of empirical facts about a phenomenon has been amassed across several studies. By contrast, this chapter assumes that the application of theoretical strategies for mapping the context of behavior can be valuable, especially during the early stages of research, as a tool for discovering the situational boundaries of psychological phenomena, specifying the dimensions on which diverse settings can be meaningfully compared, and estimating the applied utility of our theories and policy recommendations before these ideas and interventions are implemented in a costly and sometimes ineffective manner.

A subsequent section of the chapter examines some of the ways in which the proposed strategies of contextual analysis can contribute to the policy relevance of psychological research. It is suggested that the applied utility of psychological research depends not only on the scientific validity of our theories and data but also on the complexity of the settings toward which our policy recommendations are targeted. In particular, the use of contextual analysis in identifying leverage points for community interventions and criteria for judging their cost-effectiveness is discussed.

2.3. STRATEGIES OF CONTEXTUAL ANALYSIS

2.3.1 Contextual and Noncontextual Research

A fundamental idea underlying the notion of contextual research is the concept of embeddedness. That is, a particular phenomenon is thought to be embedded in (and influenced by) a surrounding set of events. The first task of contextual research is to identify the central or *target phenomenon* to be examined. Once the target variables have been specified, the next step is to define a set of situational or *contextual variables* that are thought to exert an important influence on the form and occurrence of the target phenomenon.
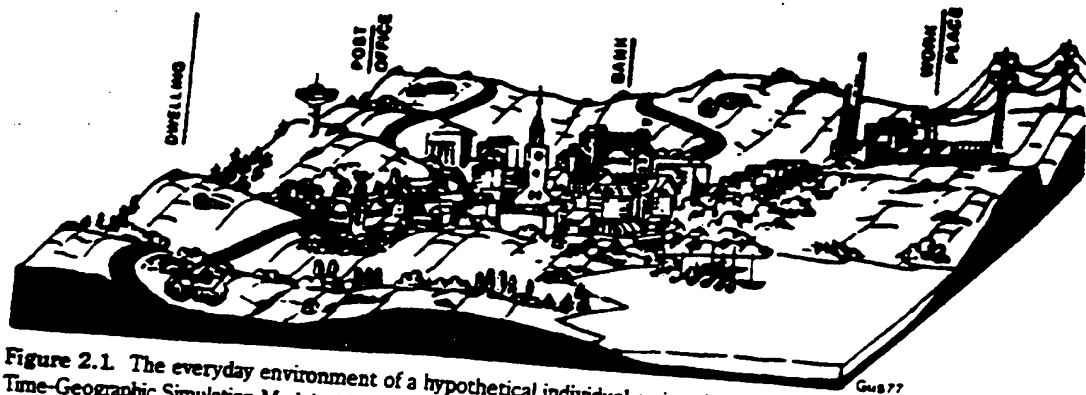
Figure 2.1 The everyday environment of a hypothetical individual as it exists in three-dimensional space. (*Source:* "A Time-Geographic Simulation Model of Individual Activity Programmes" by B. Lenntorp, in *Human Activity and Time Geography* by T. Carlstein, D. Parkes, and N. Thrift (Eds.), Halsted Press, 1978, copyright 1978 by John Wiley & Sons. Adapted by permission.)

For example, Figure 2.1 depicts the everyday environment of a hypothetical individual as it exists in three-dimensional space. Suppose that we are interested in the relationship between automobile commuting and stress, and that our main target variables are the distance of the commute between the individual's dwelling and workplace and his or her average blood pressure levels on arrival at work. Having specified these target predictor and outcome variables, we might suspect that their relationship is qualified by other aspects of the commute such as the size and luxuriousness of the individual's vehicle and the typical levels of traffic congestion encountered along the route (e.g., perhaps the commuter drives to and from work through the center of town or, alternatively, takes a longer but less congested route through the countryside). Also we might hypothesize that the relationship between driving distance and blood pressure on arrival at work is moderated by certain life circumstances extending beyond the immediate commuting situation such as the overall quality of a person's residential situation and the extent to which the inconveniences of a long commute are offset by attractive neighborhood amenities, or the degree to which the commuter is satisfied with and involved in his or her job (cf. Stokols & Novaco, 1981). These additional variables are "contextual" in the sense that they surround (or are connected in time and space with) the individual's experience of the commute to work and are thought to influence the quality and intensity of that experience.

If we hypothesize that the relationship between the target variables of commuting distance and blood pressure is not influenced by surrounding events, then there is no need to complicate our analysis by incorporating additional measures of the individual's driving, residential, and work situations. For example, we might predict that long commuting distances (e.g., 25 miles or longer) invariably raise systolic and diastolic blood pressure levels, regardless of the context in which these variables are observed. If this hypothesis is correct, then the inclusion of contextual variables in our analysis would not add appreciably to our understanding of the target phenomenon.

If, on the other hand, we suspect that the relationship between commuting distance and blood pressure is significantly qualified by situational factors, then it becomes important to include these factors in our analyses of the target variables. For if we hypothesize and find that the stressfulness of automobile commuting is moderated by the perceived quality of one's residential and work environments then we have learned more about the relationship between commuting and stress than if we had focused exclusively on the links between commuting distance and blood pressure (irrespective of home and job satisfaction levels).

To summarize, *noncontextual research* focuses entirely on the relationships between target predictor and outcome variables (e.g., commuting distance and blood pressure levels). *Contextual research*, on the other hand, incorporates supplementary predictor variables drawn from the immediate situation (e.g., levels of traffic congestion encountered along the route, size and amenities of one's vehicle) or from other areas of a person's life situation (e.g., levels of residential and job satisfaction) that presumably qualify the relationship between the target variables.

With respect to criterion (outcome) measures, a contextual analysis might incorporate not only blood

pressure measurements on arrival at work but also cross-setting assessments of emotional stress, coping strategies, and behavioral problems observed within the commuter's residential and recreational domains. A contextual approach thereby widens the scope of analysis to include not only the target variables of commuting distance and blood pressure but also supplementary indexes of environment and behavior that qualify the relationship among these variables.

2.3.2. Distinguishing Features of Contextual Theories

Given a particular set of target variables, the selection of contextual variables for empirical analysis can proceed either in an exploratory and atheoretical fashion or on the basis of theoretically derived assumptions about the target phenomenon. Lacking a well-developed theory, the researcher may begin with a tentative hunch about one or more situational moderators of the target variables. If the relevant data on these situational factors can be conveniently gathered, the researcher may pursue his or her hunch by examining the empirical relationships among the contextual and target variables. These exploratory analyses can play a useful role in the early stages of theory development by revealing situational factors that significantly influence the target variables and by excluding from further consideration those that do not.

A more systematic and powerful form of contextual analysis occurs when the research design and the empirical assessments of situational and target variables are explicitly guided by a *contextual theory*. A distinguishing feature of contextual theories is that they specify a pattern of cross-situational variation in the target phenomenon (cf. Stokols, 1983). If, for example, the target variables are commuting distance and blood pressure, then a contextual hypothesis explicitly predicts a change in the relationship between these variables, depending on the presence or absence of certain situational factors. And a contextual theory goes on to explain *why* the hypothesized cross-situational variations in the target phenomenon occur.

In contrast, *noncontextual theories* do not predict or explain cross-situational variation in the relationships among target variables. For instance, *environmental or situationist theories* construe behavior simply as a function of the immediate target situation (e.g., "Routine exposure to long-distance commutes invariably raises commuters' blood pressure."). *Trait theories* account for individual behavior entirely

in terms of personal dispositions (e.g., "Type A or coronary-prone commuters exhibit higher blood pressure upon arrival at work than Type B individuals, regardless of the distance of their commutes."). And *interactionist theories* account for behavior in terms of the joint influence of situational and intrapersonal factors.[1] For instance, Stokols and Novaco (1981) observed that commuters' blood pressure and task performance were jointly influenced by the physical distance of their commutes and by their personal dispositions toward coronary-prone behavior. In this instance, the relationship between commuting distance and behavior was moderated by an intrapersonal attribute rather than by a contextual factor. The focus of contextual theories, on the other hand, is clearly on situational rather than intrapersonal moderators of environment-behavior relationships. Thus, in contrast to environmental, trait, and interactional models, contextual theories specify a set of situational boundary conditions that qualify the relationship among target predictor and response variables.

The distinction between contextual and noncontextual theories is important, as it suggests a programmatic strategy for future research in environmental psychology: namely the development of theories that explicitly account for the situational specificity of environment-behavior relationships. Often the discovery of contextual moderators of environment-behavior relationships is treated as an "afterthought" of empirical analyses. The identification of important contextual factors tends to occur through post hoc rather than deductive assessments of external validity, or the extent to which research findings generalize across different groups of people, settings, and times (cf. Campbell & Stanley, 1963; Cook & Campbell, 1979; Mook, 1983; Petrinovich, 1979). Consequently information about contextual factors is acquired in a nonprogrammatic, happenstance manner as researchers gradually compare the findings from their separate and independently conducted studies. For example, early formulations of human response to crowding and noise treated these phenomena in a decontextualized manner, as if they could be understood apart from the contexts in which they occur. Accordingly, empirical studies were designed to test universalistic, transsituational hypotheses about the effects of these environmental conditions on behavior and well-being. The pattern of results from these early studies, however, was far more complex than had been anticipated, revealing striking differences in people's reactions to crowding and noise depending on the situational contexts in which these events were experienced. Eventually, more contextually oriented formulations of crowding

and noise were developed to account for the diverse and often contradictory findings obtained across multiple programs of research (cf. Cohen & Spacapan, 1984; Evans, 1982; Stokols, 1979).

Considering the progression of research on crowding and noise, it seems reasonable to suggest that future studies of environment and behavior could be designed more efficiently and programmatically if contextual theories were developed prior to, or as an intended outcome of, empirical research. By making the explicit consideration of contextual factors a routine part of the research process, important aspects of the target phenomenon might be revealed that otherwise would have been neglected. And oversimplified assumptions about the cross-situational generality of the phenomenon might be recognized and abandoned during the early rather than later phases of investigation.

As a general guideline for future research, an effort should be made to identify plausible contextual moderators of environment–behavior relationships in a predictive rather than post hoc fashion. This is not to suggest, however, that all target phenomena will be equally amenable to contextual analysis. For instance, many studies conducted across a wide range of settings indicate that exposure to extremely high levels of noise invariably elevates cardiovascular arousal (cf. Cohen & Weinstein, 1981). Apparently once a certain threshold of noise intensity is exceeded, the impact of this environmental factor becomes relatively uniform across individuals and settings. Also, although the behavioral and emotional effects of certain drugs are mediated by situational factors (cf. Schachter & Singer, 1962; Whalen & Henker, 1980), other pharmacological processes may be more exclusively dependent on intrapersonal factors and the type of drug introduced than on more remote aspects of the individual's spatial and social environment. Thus certain psychophysiological phenomena may be relatively invariant across a wide array of situations.

The researcher's decision to adopt or not adopt a contextual view of a given problem is therefore likely to be influenced by several considerations such as existing empirical evidence for either the cross-situational variability or the stability of the target phenomenon and the theoretical objectives of the research (e.g., whether the investigator is attempting to test hypotheses about intrapersonal or situational moderators of the target phenomenon). Moreover whether or not a contextual perspective is actually translated into an operational research design may ul-

timately depend on more pragmatic considerations especially the availability of sufficient research funding personnel, and time to permit empirical study of the phenomenon across different environmental settings.

2.3.3. Criteria for Evaluating Contextual Theories

Having mentioned some of the distinctive features of contextual theories, it is important to specify criteria for evaluating their scientific and practical value. Contextual analyses of environment and behavior can have significant advantages over noncontextual approaches, particularly when there is reason to expect that the behavior or health effects of an environmental condition are mediated by situational factors. But once the researcher has opted for a contextual approach, the question then arises: Which set of contextual variables affords the greatest analytic leverage for understanding the target phenomenon?

The Effective Context

Clearly any phenomenon can be analyzed in relation to multiple and alternative contextual factors. The key challenge in developing contextual theories is to identify from among the myriad of potentially relevant situational factors those that are most crucial for understanding the form and occurrence of the target phenomenon. I will refer to that subset of influential situational factors as the *effective context* of the target phenomenon (cf. Stokols, 1983).

The effective context for a given set of target variables is never completely knowable or specifiable, because the range of situational factors that affect a phenomenon is potentially infinite, and future environmental conditions that may impinge on individuals and groups can only be estimated rather than predicted unequivocally (cf. Manicas & Secord, 1983). Nonetheless the hypothetical notion of an effective context is useful in prompting researchers to consider the *plausible range* of situational factors that are likely to influence a phenomenon as it occurs within a particular time and place, and to distinguish (on the basis of prior theory, research, and intuition) among those factors in terms of their relative impact on the target variables.

The concept of effective context raises certain fundamental questions about the scientific and practical adequacy of contextual theories. First, how accurately does a theory specify the relationships between a set of target variables and a particular contextual variable? Second, how completely does the

theory represent the full range of important contextual moderators of the target variables? Even if a theory accurately represents the relationships between the target variables and one or more situational factors, it may fail to identify other (and perhaps more important) contextual moderators of the target phenomenon. And, third, what is the generative potential of the theory, or its capacity to provoke new insights about important contextual moderators of a target phenomenon that were not explicitly stated in the initial version of the theory? A theory may offer an incomplete account of the effective context of a phenomenon but in so doing may prompt researchers to discover new relationships between the target variables and additional contextual factors that had been overlooked in prior theorizing and research.

The questions discussed suggest certain key criteria for comparing and evaluating contextual theories, as described in the following.

Contextual Validity

The term *contextual validity* refers to the accuracy of a theory in specifying the pattern of relations among a set of target variables and one or more situational factors. For example, if a theory predicts that poststressor performance decrements are more likely to occur when the stressor is uncontrollable than when it is controllable, and the available evidence from several research programs fits the predicted pattern (cf. Cohen, 1980; Glass & Singer, 1972; Lazarus, 1966), then the theory is assumed to be valid over the range of contextual circumstances that it specifies. The contextual validity of a theory is low to the extent that it incorporates situational factors that have no influence on the occurrence and form of the target phenomenon, or those that affect the target variables in a manner that is contrary to the predicted pattern.

As mentioned earlier, many theories fail to specify the contextual moderators of a phenomenon altogether. These noncontextual theories are exemplified by statements like: "Exposure to high levels of noise invariably leads to negative aftereffects on task performance." Such statements assume that the hypothesized relations among target variables are universally valid across all situations. Any evidence of change in the target phenomenon as a function of one or more situational factors necessarily undermines the contextual validity of the original theory.

A basic question raised by the proposed concept of contextual validity concerns its potential redundancy or overlap with the related criteria of predic-

tive, external, ecological, and construct validity. Although contextual validity bears certain similarities to these concepts, it can be differentiated from them in some important respects. First, contextual validity can be defined as a subcategory of predictive validity. Contextual validity explicitly pertains to the accuracy with which a theory specifies the *cross-situational* variations in a phenomenon. Predictive validity, as it is typically defined, does not require cross-situational analysis (cf. Carmines & Zeller, 1979). A noncontextual theory might demonstrate a high degree of predictive validity within a single setting but fail to specify important moderators of the phenomenon that would only become evident in alternative and as yet unobserved settings. Thus high predictive validity of a theory within a particular setting is a necessary but not sufficient condition for contextual validity. Contextual validity specifically requires that a theory be valid in its predictions about the cross-situational variation of a target phenomenon.

Also, though the concepts of contextual, external, and ecological validity share certain similarities, they are not entirely overlapping. External validity refers to the generalizability of research findings or a proposed causal relation across populations of persons, settings, and times (cf. Campbell & Stanley, 1963; Cook & Campbell, 1979). Definitions of ecological validity are more diverse, but most emphasize Brunswik's (1956) original notion of *representativeness*—that is, the extent to which an existing event or situation is similar to, or representative of, another (cf. Bronfenbrenner, 1979; Petrinovich, 1979; Wohlwill, 1978; Winkel, Chapter 3, this volume). Contextual validity, as defined earlier, also involves an assessment of the cross-situational generalizability of theories and an appraisal of the similarity among different settings. But the present analysis of contextual validity diverges from earlier treatments of external and ecological validity in the following respects. First, although Cook and Campbell (1979) and others (e.g., Wohlwill, 1978) have distinguished between inductive and deductive analyses of external validity, recent reviews of research within several areas of psychology reveal that assessments of external validity are usually conducted in a post hoc rather than a priori fashion (cf. Dipboye & Flanagan, 1979; Mook, 1983; Winkel, Chapter 3, this volume). These atheoretical assessments of external validity often reflect what Mook (1983) has referred to as "count 'em mechanics"— the comparison of two or more situations on the basis of a haphazard rather than theoretically derived

checklist of their immediately obvious differences. By contrast, contextual validity can be assessed only in relation to those theories that explicitly posit cross-situational variations in a target phenomenon as functions of one or more contextual factors.

Another difference between the proposed concept of contextual validity and certain earlier treatments of external and ecological validity pertains to the types of situational factors invoked as evidence for the similarity of settings and for the generalizability of theories and findings across those settings. Assessments of external and ecological validity often have focused entirely on objective and readily observable attributes of places and people such as the degree of physical naturalism evident in field versus laboratory settings or the demographic similarities among individuals comprising different populations (cf. Berkowitz & Donnerstein, 1982; Brunswik, 1956; Dipboye & Flanagan, 1979; Mook, 1983). This overemphasis on objective or naturalistic criteria of external and ecological validity is unfortunate, as it has led to the neglect of more subtle, transactional dimensions of settings that impinge on individual and collective behavior. The present analysis of contextual validity, however, gives explicit attention to transactional and subjective (as well as objective) representations of settings and emphasizes their relevance to appraisals of the cross-situational generality of psychological theories.

The criterion of contextual validity is most similar to Winkel's (Chapter 3, this volume) conceptualization of ecological validity. Winkel explicitly links the assessment of ecological validity to a theoretical and empirical modeling process in which the researcher attempts to identify those aspects of situations that exert an important influence on psychological and behavioral phenomena. He defines ecological validity as:

> The extent to which the overall design of the research plan and the specific measuring instruments that are employed yield accurate estimates of the multiple dimensionality of the phenomenon that is the focus of study and those components of the context that may be expected to influence variation in the phenomenon. (p. 83)

Winkel further states that his definition of ecological validity refers not only to the adequacy of the methods and procedures incorporated within the research plan but also to the explanatory system that is advanced to account for the findings.

The proposed criterion of contextual validity diverges from Winkel's conception of ecological validity in two important respects. First, the former concept

focuses in a more limited way on the adequacy of theoretical formulations, rather than research techniques, in identifying cross-situational variations in the target phenomenon. A theory may accurately specify the contextual moderators of a phenomenon, yet the methods chosen to assess the theory may themselves be unreliable and/or invalid. The present analysis, therefore, treats the contextual validity of theories and the construct validity of methods (cf. Cook & Campbell, 1979) as two separate, albeit closely related, issues, whereas Winkel's analysis subsumes these issues under the broader concept of ecological validity.

Second, as an alternative to the post hoc, atheoretical assessments of ecological validity that are prevalent in behavioral research, the present analysis of contextual validity emphasizes the value of a priori theorizing about the situational moderators of target phenomena. This perspective is not meant to deny the usefulness of inductive, exploratory studies as a basis for developing empirically grounded explanations of the relations between target and contextual variables (cf. Glaser & Strauss, 1967; Winkel, Chapter 3, this volume). Nevertheless the present analysis gives relatively greater attention to the theory development (vs. data collection) phase of contextual research and underscores the scientific value of developing predictive (vs. post hoc) theories about the situational moderators of target phenomena.

Finally it is important to note certain divergencies between earlier discussions of construct validity (cf. Cook & Campbell, 1979) and the proposed criterion of contextual validity. *Construct validity* generally refers to the degree of match between research operations and theoretical constructs—that is, the extent to which the former adequately represent the latter. From the perspective of construct validity, contextual factors that alter the relationships among target variables are viewed as situational *confoundings* of the presumed causes and effects (i.e., the target predictor and outcome variables). Many of the threats to construct validity discussed by Cook and Campbell (e.g., the interaction between testing situations and treatment; restricted sampling of treatment and response levels and of testing intervals) relate to sources of situational confounding that can distort the researcher's assessments of the target variables. From the perspective of contextual theorizing, however, the identification of situational sources of variation in the target phenomenon becomes important, not as a means for achieving a clean or unconfounded representation of the target phenomenon, but rather

as the basis for developing a broader theoretical understanding of the relationships between target phenomena and their situational contexts (for further discussions of this perspective see also Petrinovich, 1979; Winkel, Chapter 3, this volume). Thus whereas the construct validity perspective is oriented toward identifying sources of situational confounding and eliminating them from research assessments of the target phenomenon, the goal of contextual theorizing is to incorporate potential sources of situational variability into more integrative and environmentally contingent explanations of behavior.

In summary, the concept of contextual validity is distinguishable from several related validity criteria and offers a practical guideline for encouraging the development of theories that are sensitive to cross-situational variations in environment–behavior relationships. Although the criterion of contextual validity can be applied as an "absolute" standard for evaluating individual theories, its utility as a tool for theorizing and research becomes most apparent when one is attempting to choose among alternative theories of the same phenomenon. In the earlier-mentioned example of commuting and stress, one theory might predict that high levels of social support among co-workers *intensify* the cardiovascular strains of long-distance commuting because the individual is eager to arrive at the workplace each day and therefore is likely to be frustrated by travel delays that impede the journey to work. On the other hand, an alternative theory might predict that high levels of social support at work *buffer* the stressful effects of long-distance commuting by providing psychological "compensation" for the inconveniences experienced during the daily drive to work (cf. Campbell, 1983). And a third theory might suggest that the availability of social support at work has *no influence* on the relationships between commuting distance and blood pressure, but that other situational factors such as the crowdedness of one's home and neighborhood moderate the effects of driving distance on commuters' blood pressure. Each of these theories makes a different prediction about the role of social support among co-workers in moderating the relationship between commuting and stress. Thus the three theories can be evaluated in terms of their relative accuracy in predicting the empirically observed pattern of covariation among the target and contextual variables.

Relative Power and Efficiency of Contextual Theories

An additional criterion for gauging the adequacy of contextual theories is their *relative power*, or the extent to which they encompass the full range of situational factors that qualify a particular phenomenon. A contextual analysis may correctly identify some of those conditions but may exclude several others. For example, a theory may accurately account for the influence of social support at work on the relationship between commuting distance and stress. But if other contextual variables such as dwelling and neighborhood crowding are also important in explaining the target variable relationships, then a theory that focuses only on the moderating role of social support at work would be less powerful than one that explains the contextual influence of residential crowding, as well.

Alternatively a contextual analysis may be too inclusive, incorporating situational factors that are negligibly related to the target variables. This case suggests another criterion for evaluating contextual theories, namely, their *efficiency*. A contextual analysis is efficient to the extent that it includes those and only those situational factors that exert a significant influence on the target variables. In the preceding example, if we determine empirically that social support at work, but not home and neighborhood crowding, qualifies the relationships between commuting distance and blood pressure, then the theory that focuses only on the moderating role of social support would be more efficient than the one that also incorporates the variables of home and neighborhood crowding. The theories may be equally powerful in explaining the moderating role of social support at work, but the former is more efficient or parsimonious than the latter because it omits the trivial variables of residential and neighborhood crowding.

Thus it is possible to evaluate theories not only in terms of their accuracy in specifying the relationships between a particular contextual factor and the target variables but also with respect to their power and efficiency in representing the full range of situational factors that collectively exert the greatest influence on the target phenomenon. In short, the power and efficiency of a contextual theory increase to the extent that it accounts for a large rather than small proportion of the effective context, while excluding those situational factors that are negligibly related to the target variables.

The criteria of relative power and efficiency are directly relevant to the questions raised earlier about which phenomena are amenable to contextual analysis and, for those that are, how broadly the effective context should be drawn. Because the range of influential contextual factors varies across psychological phenomena (with some being impervious to situa-

tional influence and others being highly dependent on the context in which they occur), it is important for researchers to give careful consideration to the effective context of the target phenomenon during the early stages of theorizing, and to be as selective as possible in deciding which contextual variables should be incorporated into their theories and research designs.

Generativity of Contextual Theories

Ideally theories of environment and behavior should demonstrate high levels of contextual validity, relative power, and efficiency. However, certain theories that are inadequate according to these criteria may still be valuable in sensitizing researchers to important situational moderators of psychological phenomena. Following Gergen's (1973, 1978) and Cronbach's (1975) discussions of the sensitization functions of theory, the generativity of contextual theories is defined here as their capacity to provoke new insights about important contextual moderators of a target phenomenon that were not explicitly stated in the initial version of the theory or in earlier theoretical and empirical work.

The generative potency of a theory is difficult to evaluate in the short run and requires a prospective analysis of the theory's impact on subsequent conceptualizations of a phenomenon. Nonetheless the generativity criterion is useful in that it underscores the importance of the sensitization functions of contextual theorizing and the potential contributions of preliminary yet provocative theories to the evolution of more valid, powerful, and efficient explanations of environment and behavior.

As an illustration of the generativity of contextual theories, consider the issue of environmental stress. A contextually narrow theory of stress might focus on the controllability or uncontrollability of the immediate stressor, without considering the moderating influence of other factors in the immediate situation, or of events occurring outside the situation within other life domains. A broader contextual analysis, however, would examine individuals' reactions to an environmental stressor as they are moderated by events both within and outside the immediate stressor situation. The mapping of stress phenomena in relation to one's overall life situation, for example, might suggest hypotheses about the ways in which uncontrollable stressors in one life domain are offset by highly desirable events within another (cf. Campbell, 1983; Jacobi, 1984); or about life-style factors associated with the temporal and spatial organi-

zation of one's life situation that may be promotive of Type A behavior, chronic stress, and health problems (cf. Cullen, 1978; Michelson, 1985). Thus the process of contextually mapping the phenomena of stress and well-being across the major settings of one's life may generate new insights about these phenomena that would be missed by a contextually narrower analysis.

This section has focused on evaluative criteria that are especially appropriate for judging the scientific value of contextual theories (see Table 2.1). There are, of course, several other criteria that apply equally well to assessments of noncontextual as well as contextual theories such as the theory's testability, its consistency with available empirical evidence, and its utility or applicability to everyday problem solving. The utility criterion is discussed in a subsequent section of this chapter pertaining to the policy relevance of contextual theorizing and research. For more general discussions of criteria for evaluating psychological theories, see Cook and Campbell (1979), Cronbach (1975), Gergen (1978), Platt (1964), and Shaw and Costanzo (1970).

2.3.4. Modeling the Effective Context of the Target Phenomenon

Faced with a multitude of potentially relevant situational factors, the process of identifying the effective context of various environment–behavior phenomena can be challenging and complex. One strategy for reducing the complexity of this task is to organize the search for situational moderators of the target phenomenon around certain basic dimensions of contextual analysis: namely, (1) the *contextual scope* of the analysis, as reflected in the range of spatial, temporal, and sociocultural factors that are thought to influence the target variable relationships; (2) the joint use of both *objective and subjective representations* of the target and contextual variables; (3) the *individual or aggregate level* at which contextual and target variable relationships are examined; and (4) the representation of people and environments in

Table 2.1 Criteria for Developing and Evaluating Contextual Theories

1. Contextual validity
2. Relative power
3. Efficiency
4. Generativity
5. Applied Utility

Table 2.2. Dimensions of Contextual Representation

1. Spatial, temporal, and cultural *scope*
2. Individual or aggregate *level*
3. Objective or subjective *focus*
4. Partitive or composite *structure*

terms of their independent or *partitive characteristics*, or in terms of higher-order, *composite concepts* (e.g., person–environment fit, place identity) that reflect the interdependence among people and their surroundings.

Any target phenomenon can be modeled in relation to these general contextual dimensions (see Table 2.2). The ensuing discussion examines each of the four mapping dimensions and the ways in which their systematic application can enhance the researcher's efforts to identify and operationally measure the effective context of the target phenomenon.

Contextual Scope: Spatial, Temporal, and Sociocultural Dimensions

The environmental contexts of people's day-to-day activities can be described in terms of their scale or complexity. The scale of environmental units ranges from the specific stimuli and situations that occur within a given setting to the more complex life domains that comprise multiple situations and settings. *Situations* are sequences of individual or group activities that occur at a particular time and place (cf. Forgas, 1979; Pervin, 1978). *Settings* are geographic locations in which various personal or interpersonal situations recur on a regular basis (cf. Stokols & Shumaker, 1981; Barker, Chapter 40, Wicker, Chapter 16, this volume). *Life domains* are different spheres of a person's life such as family, education, spiritual activities, recreation, employment, and commuting (cf. Campbell, 1981; Stokols & Novaco, 1981). An even broader unit of contextual analysis is the individual's *overall life situation* (cf. Magnusson, 1981), consisting of the major life domains in which a person is involved during a particular period of his or her life.

Just as environmental units can be arrayed with respect to their scale or complexity, contextual analyses can be compared in terms of their relative scope. The *contextual scope* of research refers to the scale of the contextual units included in the analysis. A set of target variables can be examined in relation to the immediate situation in which they occur, or in relation to broader and more remote segments of the

individual's life situation and life history. Moreover a contextual analysis may exclude any reference to the social–structural or cultural context of the target phenomenon or, alternatively, may encompass sociocultural conditions within the immediate target situation and those whose influence extends beyond that setting. Thus theoretical and empirical analyses of environment and behavior can be compared on at least three different dimensions of contextual scope: namely, spatial, temporal, and sociocultural scope.

The dimensions of contextual scope suggest an important distinction between the ecological environment as it exists in reality and the environment as it is modeled in relation to a particular individual or group. For example, Figure 2.1 offers a detailed geographic overview of a person's major life domains as they are arrayed in three-dimensional space. In Figure 2.2, however, the environment is represented more abstractly in terms of a daily activity program — that is, a record of the individual's distribution of daily activities and allocation of time across residential, transportation, employment, and commercial settings (cf. Lenntorp, 1978). The time-geographic simulation of an activity program is a highly selective representation of the individual's relationship to his or her environment because it describes only certain facets of that relationship — namely, the temporal and spatial distribution of one's daily activities. Thus even as the scale of the environmental units included in an analysis increases (e.g., from a focus on single situations to a broader analysis of multiple life domains) the actual number of contextual variables chosen to represent the relevant environmental dimensions might remain relatively small.

The *spatial scope* of an analysis increases to the extent that it represents places, processes, and events occurring within a broad rather than narrow region of the individual's (or group's) geographical environment. In Figure 2.2, the activity program encompasses a geographically broader range of settings (e.g., the home, workplace, commute to work, commercial areas) than a more limited record of one's behaviors within the dwelling alone. Similarly the *temporal scope* of an analysis increases to the extent that it represents places, processes, and events experienced by the individual or group within an extended rather than narrow time frame. For instance, a time budget summarizing the individual's typical allocation of activities over a calendar year would be of broader temporal scope than one compiled in relation to a single 24-hour period. Finally the *sociocultural scope* of an analysis increases to the extent that it de-
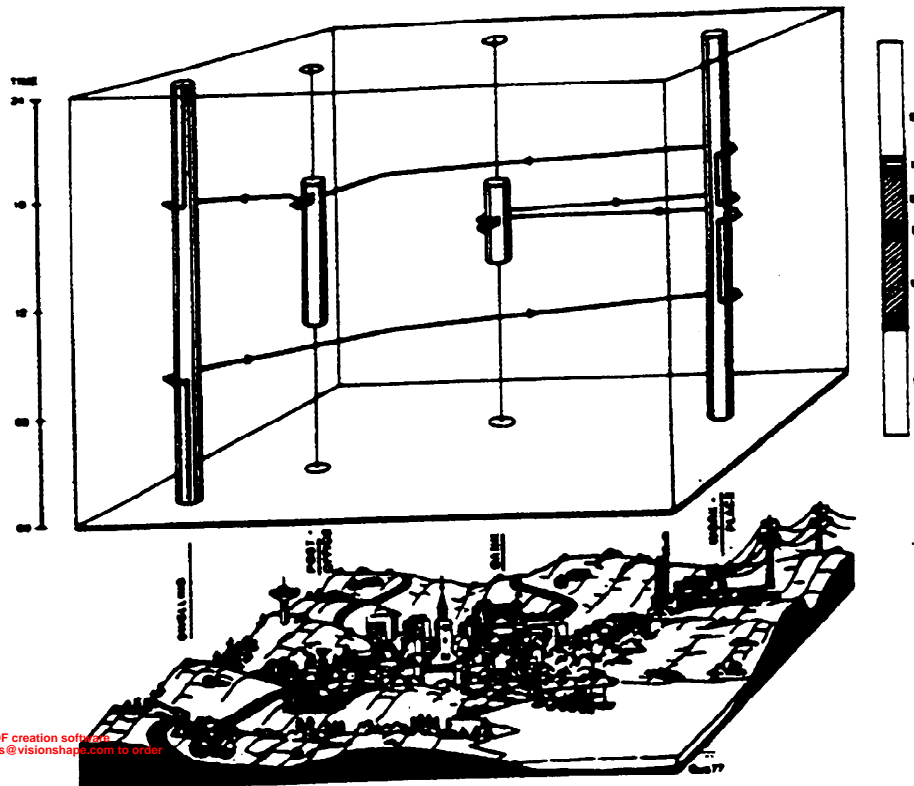
Figure 2.2. A time-geographic analysis of the individual's daily activity patterns. (*Source:* "A Time-Geographic Simulation Model of Individual Activity Programmes" by B. Lenntorp, in *Human Activity and Time Geography* by T. Carlstein, D. Parkes, and N. Thrift(Eds.), Halsted Press, 1978. copyright 1978 by John Wiley & Sons. Reprinted by permission.)

scribes behaviorally relevant dimensions of an individual's or group's sociocultural environment. To understand extreme departures from a person's typical activity patterns, for example, it may be necessary to consider the influence of national or religious holidays and other public events that impinge on people's regular activities. Thus a time-geographic analysis that accounts for such events would be of broader sociocultural scope than one that excludes them.

The above dimensions suggest a continuum of research ranging from narrow to broad contextual scope. At the "narrow" end of the continuum are those analyses that are conceptually and methodologically reductionistic. That is, the conceptualization and measurement of the phenomena under study are limited to target events that occur within a spatially, temporally, and socioculturally restricted situation. Located at the "broad" end of the continuum are analyses in which the target predictor and criterion variables are examined in relation to conditions occurring within a wide rather than restricted region of the

individual's geographical and sociocultural environment. and within an extended rather than narrow interval of the individual's life experience.[2]

Any attempt to discover the effective context of a phenomenon begins with some preliminary deliberation about the appropriate scope and content of the analysis. The researcher must decide how broadly to construe the relevant context of the phenomenon and which contextual factors exert a significant rather than trivial influence on the phenomenon. The broader and more complex the contextual units of analysis, the greater the potential range of factors — psychological, sociocultural, architectural, and geographic — that can affect a person's relationships with his or her surroundings. For any phenomenon. the researcher must try to determine at what point increasing or decreasing the scope of the contextual variables brings diminishing returns in terms of the explanatory power of the analysis.

When the researcher has access to extensive prior information about the situational variability of a

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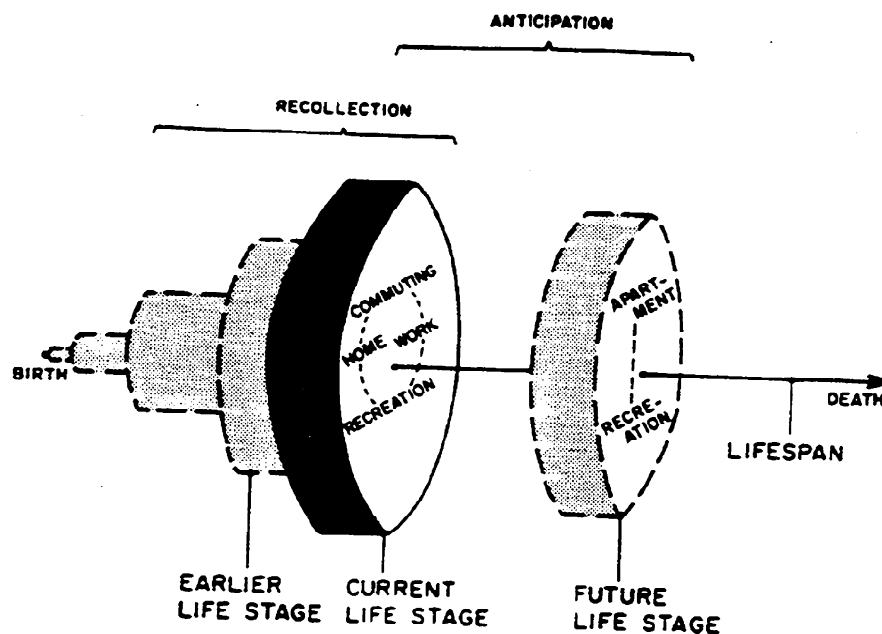
INTER-STAGE CONTEXT OF ENVIRONMENTAL EXPERIENCE

Figure 2.3. Individuals' judgements about the quality of past and future life stages have been found to play an important role in moderating the health consequences of residential change. (*Source:* "Environmental Psychology: A Coming of Age" by D. Stokols, in *G. Stanley Hall Lecture Series* (Vol. 2), by A. G. Kraut (Ed.), copyright 1982 by American Psychological Association. Reprinted by permission.)

phenomenon, decisions regarding the appropriate scope of the analysis become relatively straightforward. When one is lacking such information, however, it may be useful to adopt a broad contextual orientation during the early phases of an investigation (e.g., during the theorizing that often occurs prior to the design and implementation of the research). This approach avoids a premature narrowing of contextual scope while permitting the gradual deletion of irrelevant situational dimensions as additional insights and information about the phenomenon are acquired. Adopting a contextually narrow perspective at the outset may unduly limit the possibilities for discovering the situational moderators of the target phenomenon as the research proceeds.

Consider, for example, the relationship between residential mobility and health. On the one hand, it is possible to construe relocation as an acute, short-term life event whose effects on health depend primarily on conditions directly associated with the move and are manifested during the period im-

mediately preceding and following the move. Alternatively the health effects of mobility could be examined within a broader spatial and temporal context encompassing one's feelings about previous residential situations, the current dwelling, and anticipated housing options for the future; they could be assessed longitudinally as they unfold across a spatially extended range of life domains including home, work, commuting, and recreation. In keeping with the latter perspective, a study by Stokols, Shumaker, and Martinez (1983) explicitly examined the temporal and spatial context of mobility and personal well-being. The links between mobility and health were assessed in relation to individuals' judgments about the quality of previous and future residential stages as well as their current job and residential situations (see Figure 2.3). Our findings suggested that an understanding of relocation and health can be enhanced by considering these phenomena not only in relation to the immediate circumstances surrounding a move, but also within the broader context of the individual's

residential history, current life situation, and aspirations for the future.

The relative power and generativity of contextual analyses also depend on their capacity to identify important sociocultural moderators of target phenomena. Several areas of environmental research suggest that social–structural and cultural processes are crucial to an understanding of person–environment transactions. Studies of crowding, for example, indicate that group structure, composition, and cohesion moderate the intensity of stress reactions to high-density settings (cf. Cassel, 1974; Epstein & Karlin, 1975; Baum & Paulus, Chapter 14, this volume). Also, research on territoriality and personal space suggests that cultural norms influence the nature and intensity of people's reactions to territorial infringements and interpersonal proximity with strangers (cf. Altman & Chemers, 1979; Aiello, Chapter 12, Brown, Chapter 13, this volume). Thus it is important for environmental psychologists to consider sufficiently the possible links between the target phenomenon and various aspects of the sociocultural environment over the course of their theorizing and research.

The systematic assessment of spatial, temporal, and sociocultural scope does not ensure that the key contextual moderators of a phenomenon will be discovered. Nonetheless these dimensions of contextual scope are useful in that they offer a set of analytical coordinates for mapping diverse phenomena in relation to alternate clusters of contextual variables. This exploratory mapping process often can enhance efforts to discover the effective context of a phenomenon by highlighting important geographic, temporal, and cultural aspects of the phenomenon that might otherwise be overlooked.

Having delimited the scope of analysis and selected certain contextual variables for further assessment, the researcher may then consider how best to represent those variables in operational terms.
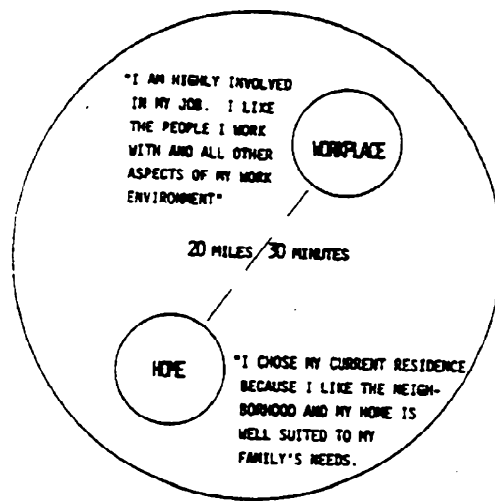
Objective and Subjective Representations of Contextual and Target Variables

Contextual and target variables can be represented in objective terms irrespective of the individual's perception and cognition or, alternatively, from the subjective vantage point of the individual or group. For example, the commute between home and work can be represented objectively in terms of its physical distance and duration or in terms of the driver's perception of traffic congestion along the route. Also

levels of overcrowding in the commuter's home or neighborhood can be described in terms of actual density levels or through measures of perceived residential and neighborhood crowding. Similarly the commuter's stress reactions can be assessed objectively through physiological recordings of arousal (e.g., blood pressure measures; biochemical assays of urinary adrenaline levels) and observations of overt behavior (e.g., task performance at work) or subjectively through self-report measures of stress symptoms such as negative mood states and perceived time demands.

Whereas many research programs rely exclusively on either an objectivist or a subjectivist approach, the contextual orientation described here underscores the value of combining both perspectives in research on environment and behavior. For instance, research on automobile commuting and stress suggests that the effects of long-distance driving on measures of mood, physiology, and task performance at work are not uniform across individuals but instead depend on commuters' appraisals of their residential and employment domains (cf. Stokols, Novaco, Stokols & Campbell, 1978; Stokols & Novaco, 1981). Among long-distance commuters, those reporting high levels of job involvement and choice in selecting their current residence exhibited lower stress across a variety of measures. Only by examining commuters' subjective reports of their home and work environments was it possible to detect the influence of these domains in qualifying the behavioral effects of commuting distance, an objective feature of a person's everyday environment (see Figure 2.4).

An important methodological reason for combining objective and subjective representations of environment and behavior within the same analysis is to counterbalance the respective strengths and weaknesses of these measurement approaches (cf. Cohen, Kamarck, & Mermelstein, 1983). For instance, subjective measures of environment and behavior share common method variance (e.g., attributable to response sets, memory distortions, denial, and/or other psychological defense mechanisms). Therefore the degree of spurious correlation between these predictor and criterion variables is likely to be greater than among a "mixed" set of objective and subjective measures (cf. Derogatis, 1982; Guski & Rohrmann, 1981). The strategy of combining objective and subjective measures of predictor and response variables can enable the researcher to offset the relative weaknesses of the two separate approaches and to assess the degree of convergence and divergence among the various measures included

The decision to represent an environment from the perspective of an individual or a group of individuals depends on the target issues we are attempting to explain. In research on spatial cognition, the analysis of individual sketch maps may reveal the geographic and architectural features of environments that contribute to their physical imageability. Yet if we want to understand the influence of cultural and historical factors on the imageability of urban areas then it becomes necessary to aggregate the data from individual maps and to identify those areas of the environment that are collectively recognized or remembered among a sample of their residents and users. In their research on cognitive maps of Paris, for example, Milgram and Jodelet (1976) analyzed cognitive maps from both an individual and an aggregate perspective and were able to show that the imageability of various locations in a city is influenced not only by the architectural and geographical characteristics of those places but also by their historical and cultural significance for the city's residents.

An additional reason for linking individual and aggregate levels of analysis is that the relationship between specific environmental conditions and a person's behavior may be mediated by his or her membership in various demographic groups (e.g., age cohorts, dual-career families, single-parent households). In research on work environments, for example, individuals belonging to different age and developmental cohorts have been found to vary considerably in their values and expectations about their jobs and their sensitivities to physical conditions of the workplace such as natural lighting, ergonomic amenities of workstations, and noise (cf. Cakir, Hart, & Stewart, 1980; Jones & Davies, 1984; Wurtman, 1975). Also the multiple family roles and activities performed by the members of dual-career and single-parent groups may increase the vulnerability of those individuals to the stressful consequences of environmental demands at work (cf. Everly & Feldman, 1985; Jacobi, 1984; Michelson, 1985). To the extent that studies focus exclusively on individuals' performance and health, subgroup variations in response to the work environment will be overlooked. At the same time, however, an entirely aggregate level of analysis ignores the important role of personal dispositions and risk factors in moderating individuals' performance and health, given a particular set of environmental conditions (cf. Caplan, 1983; Glass, 1977; Hedge, 1984; Kobasa, 1979). Therefore the limitations inherent in purely individual or aggregate analyses can be offset by adopting a more integrative, cross-level approach to the conceptualization

OBJECTIVE AND SUBJECTIVE REPRESENTATIONS
OF LIFE DOMAINS

Figure 2.4. The combined use of objective and subjective representations of the individual's commute between home and work.

in the analysis (cf. Campbell & Fiske, 1959; Cohen, Evans, Stokols, & Krantz, 1986; Webb, Campbell, Schwartz, Sechrest, & Grove, 1981).

Individual and Aggregate Levels of Analysis

The distinction between contextual and noncontextual features of the environment depends partly on whether the focus of analysis is on an individual or some aggregate of individuals. The term *contextual* applies not to any and all attributes of real settings but only to those conditions that constitute the external environment of a particular individual or group. Conditions of crowding and noise at work, for example, are aspects of the individual's job environment that may influence his or her job satisfaction and productivity. But if the focal unit of analysis is the work organization as a whole, then the exposure of workers to crowding and noise would be viewed as an intrasystem factor rather than as a condition of the company's external environment. Accordingly, if we were interested in estimating the long-term viability of the company, it might be necessary to look beyond the physical and social conditions within the organization to more remote, external events such as government monetary policies and competition from other corporations—all of which may affect the long-range survival of the firm.

and measurement of environmental conditions and their impacts on performance and health.

Partitive and Composite Representations of People and Environments

Partitive analyses view places and their occupants as independent entities and emphasize the interactive effects of environmental and personal attributes on various criteria of behavior and well-being (e.g., the effects of workstation enclosure on task performance, as mediated by individual preferences for high or low levels of arousal; cf. Mehrabian & Russell, 1974). Composite analyses, on the other hand, treat people and places as closely interrelated within a common behavioral setting or system (cf. Barker, 1968). A major goal of composite analyses is to develop concepts for representing the varieties of interdependence that can exist among people and their sociophysical surroundings (e.g., the notions of person–environment fit, social climate, place identity, and place dependence; cf. Caplan, 1983; Kaplan, 1983; Moos, 1979; Proshansky, Fabian, & Kaminoff, 1983; Stokols & Shumaker, 1981). An additional goal of composite analyses is to explain how the relationships among specific environmental and behavioral variables (e.g., degree of workstation enclosure and task performance) are qualified by the situational contexts in which they are observed (e.g., loosely structured groups whose members collaborate closely on common tasks). Thus composite analyses treat structured situations as the primary units of analysis and provide theoretical terms for describing and classifying diverse environmental settings.

The distinction between partitive and composite theories is important for several reasons. First, it reveals that the contextual boundaries of psychological phenomena do not always reside in the observable features of settings or in the demographic characteristics of their occupants. Instead, the effective context of certain phenomena may be better represented in terms of more covert, abstract dimensions of the relationships between people and their surroundings. Consider for example the two places depicted in Figure 2.5a and 2.5b. The first is a street corner in Las Vegas, Nevada. The second is the Wailing Wall in Jerusalem. A partitive analysis would differentiate these two areas on the basis of several situational elements including the cultural attributes of the occupants, age of the buildings in the area, the kinds of activities that go on in the location, and the relative historical continuity and significance of the area (see Fig. 2.6a). A composite analysis, however,

might distinguish these settings in terms of the degree to which each constitutes a *traditional* or *nontraditional behavior setting*. As defined by Jacobi and Stokols (1983), a traditional behavior setting is an environment where the activities of its occupants directly reinforce the historical continuity of the place and the perceived ties between past, present, and future generations of occupants (see Fig. 2.6b). The Wailing Wall in Jerusalem exemplifies a traditional behavior setting in the sense that it holds deep religious significance for a particular cultural group who have performed the same (or similar) traditional activities in the place over several generations. Rather than treating people, places, and recurring activities as independent parts of the situation, the composite construct portrays them as interdependent and consolidates or "chunks" these components into a new summary concept—in this case, the concept of a traditional behavior setting (see Fig. 2.6b).

The distinction between traditional and nontraditional behavior settings provides a theoretical basis for comparing diverse environments and also suggests a set of boundary conditions that may qualify existing psychological theories. Analyses of social support, for example, often ignore the role of the physical environment in conveying indirect or noninteractional forms of support. The notion of a traditional behavior setting, however, suggests that the physical elements of these places acquire a high degree of symbolic significance to the group, and that a vicarious sense of social support may accrue to the individual group member by virtue of his or her mere presence in the area. Also, in relation to a different substantive concern, environmental degradation, the traditional behavior-setting notion suggests that the occurrence of littering and other forms of defacement may be restricted in traditional settings, and that the influence of situational factors (such as large group size and visibility of prior litter) that would otherwise promote degradation in a nontraditional area may be offset by the strong tendencies toward environmental preservation within traditional settings.

An advantage of composite analyses is that they often reveal previously neglected processes by which target phenomena are contextually moderated. A common approach to representing person–environment relationships is to view them in terms of the statistical interactions among multiple predictor variables. This approach is typified by statistical analyses of trait-by-situation interactions (cf. Endler & Magnusson, 1976). It is also reflected in the earlier-mentioned analysis of commuting distance and the coronary-prone behavior pattern as joint predictors of

blood pressure. Yet contextual factors also may qualify target phenomena by precluding their occurrence or by changing their perceived meaning. For instance, phenomena such as noise and crowding stress may be prevalent within settings such as urban transit or commercial districts, but relatively atypical within libraries or wilderness areas. These instances, in which the occurrence of the target variables is either restricted or precluded by contextual factors, are not adequately represented in terms of the statistical interactions among independent variables.

An illustration of how contextual factors can alter the meaning of target variables is provided by the now famous Hawthorne studies of environmental conditions at work and employee productivity (cf. Roethlisberger & Dickson, 1939). In this research, increases as well as decreases in illumination levels within workstations were associated with improved performance. These initially unexpected findings were later explained in terms of the symbolic significance of the environmental changes and the fact that both interventions, either to increase or to decrease illumination, were viewed by employees as being part of a larger research program implemented by the management to improve working conditions. In this instance, the composite dimension of management concern, rather than interacting statistically with levels of illumination, altered the basic meaning of the physical stimulus to the workers (see Fig. 2.7). Within the context of a less structured social situation or, alternatively, one in which the management appeared to be unconcerned about workers' welfare, the meaning of the physical intervention and its impact on productivity might have been different (cf. Merton, 1968).

The utility of partitive versus composite perspectives depends largely on the level of interdependence that exists among people and their environments. While transactional analyses of situations (e.g., Barker, 1968; Altman & Rogoff, Chapter 1, Wapner, Chapter 41, this volume) treat interdependence as a

Figure 2.5.(a) A street corner in Las Vegas, Nevada. (Source: The Complete Nevada Traveler: A Guide to the State by D. Toll, copyright 1981 by Gold Hill Publishing Co. Reprinted by permission.)

Figure 2.5.(b) The Wailing Wall in Jerusalem. (*Source: Jerusalem, Sacred City of Mankind: A History of Forty Centuries* by T. Kollek and M. Pearlman, copyright 1968 by Steimatzky's Ltd. Reprinted by permission.)

constant or a given, the present discussion of contextual theorizing views interdependence as a variable (cf. Weick, 1979). For instance, many person–environment encounters such as those that occur in temporary, short-term situations (e.g., public transportation environments) involve less interdependence among individuals and the physical and social features of the setting than those that occur within the context of more structured settings (e.g., within home, school, or workplace). In transitory and unstructured situations, composite concepts of situational structure might be irrelevant and superfluous. In these instances, environmental and personal characteristics could be viewed as relatively independent elements of the setting. In more complex and organized settings, however, composite terms can provide a powerful and efficient representation of environment and behavior since they consolidate multiple situational and personal attributes into a smaller number of unifying constructs, each of which describes a theoretically significant form of interdependence among people and their surroundings.

2.3.5 Research Biases Resulting from Inadequate Modeling of the Effective Context

The dimensions of contextual representation outlined previously offer a framework for organizing conceptual and empirical research on environment and behavior. Rather than focusing prematurely on either pole of each dimension (e.g., narrow *vs.* broad contextual scope, and the use of objective *or* subjective measures at either an individual *or* aggregate level), the researcher can exploratively "map" a set of target variables at multiple points along all four continua. This exploratory mapping process can be useful in suggesting hypotheses about the range and content of contextual factors that significantly influence the target phenomenon.
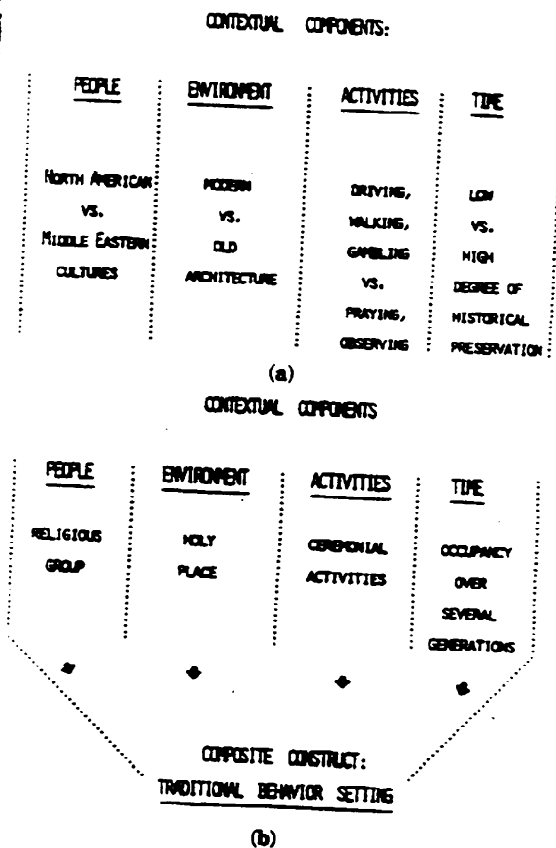
CONTEXTUAL COMPONENTS:

PEOPLE	ENVIRONMENT	ACTIVITIES	TIME
NORTH AMERICAN vs. MIDDLE EASTERN CULTURES	MODERN vs. OLD ARCHITECTURE	DRIVING, WALKING, GAMBLING, vs. PRAYING, OBSERVING	LOW vs. HIGH DEGREE OF HISTORICAL PRESERVATION

(a)

CONTEXTUAL COMPONENTS

PEOPLE	ENVIRONMENT	ACTIVITIES	TIME
RELIGIOUS GROUP	HOLY PLACE	CEREMONIAL ACTIVITIES	OCCUPANCY OVER SEVERAL GENERATIONS

COMPOSITE CONSTRUCT: TRADITIONAL BEHAVIOR SETTING

(b)

Figure 2.6.(a) A partitive analysis of the differences between the Las Vegas and Jerusalem locations. (*b*) The concept of traditional behavior setting consolidates multiple features of the Wailing Wall area into a composite construct.

To the extent that the scope, level, and content of contextual analyses encompass those situational factors most relevant to the phenomenon under study, the scientific and practical value of our theories is enhanced. On the other hand, premature selection of inadequately drawn constructs can lead to a variety of research biases that obscure important theoretical and policy questions. Figure 2.8a–2.8d summarizes eight types of research bias that can result from inadequate modeling of the effective context of a particular phenomenon. Each of these biases stems from a mismatch between the scope, level, or content of a contextual analysis and the inherent qualities of the target phenomenon itself (e.g., whether the phenomenon is actually influenced by a narrow as opposed to a wide range of contextual factors, at both individual and aggregate levels of analysis, and irrespective of the complexity of situational structure).

The dimensions of spatial, temporal, and sociocultural scope suggest at least two types of bias that can occur in environment–behavior research. For those target phenomena that are influenced by a wide range of contextual factors, analyses of narrow scope will have low explanatory power because they fail to encompass a significant portion of the effective context of the phenomena. Alternatively for those environment–behavior relationships that are relatively invariant across a wide range of situations (e.g., the frequently observed link between exposure to high-intensity noise and elevated blood pressure), analyses of broad contextual scope are inefficient since they incorporate situational factors that have a negligible influence on the target phenomenon (see Fig. 2.8a). These potential sources of bias suggest a basic guideline for theory development and research design; that is, every effort should be made by researchers to match the contextual scope of their analysis with the range of spatial, temporal, and sociocultural factors that are thought to exert a significant influence on the target phenomenon.

An exclusive reliance on either objective or subjective representations of target and contextual variables can lead to at least two additional types of bias: environmental determinism, or the tendency to interpret behavior entirely in relation to the objective properties of the physical and social environment (cf. Franck, 1984); and extreme subjectivism, whereby the direct (nonpsychologically mediated) effects of environmental conditions on behavior are ignored (cf. Sampson, 1981; Wohlwill, 1973). The integration of objective and subjective perspectives, particularly dur-

ing the early stages of theoretical and empirical work, can reduce these sources of bias (see Fig. 2.8b).

Also it was noted earlier that an emphasis on cross-level analyses, linking both individual and aggregate perspectives, can serve as a useful strategy for reducing two additional sources of research bias: namely an insensitivity to subgroup variations in people's response to the environment resulting from an exclusive focus on the individual level of analysis; and the neglect of intrapersonal moderators of environment–behavior relationships (e.g., life history, personality, health status) that typifies much aggregate-oriented research (see Fig. 2.8c). The avoidance of these individualist and collectivist biases requires that the levels of analysis chosen to represent the relations between people and their environments be commensurate with both the individual and the aggregate processes inherent in the target phenomena.

Finally the use of partitive or composite constructs that are inadequately matched with the structure of the target situation can introduce at least two other forms of research bias: namely an overemphasis on either the systemic or the mechanistic qualities of environment–behavior relationships (see Fig. 2.8d). In the former case, composite concepts attribute a greater degree of organization and structure to the target situation than actually exists. In the latter case, partitive terms fail to represent the systemic qualities of organized settings, thereby conveying an overly mechanistic view of the transactions
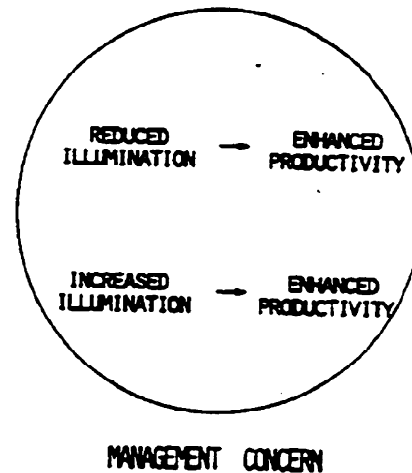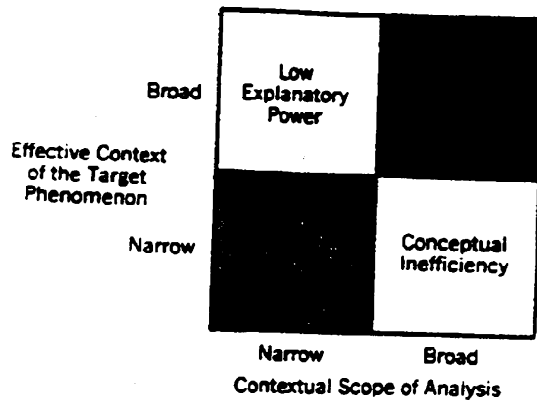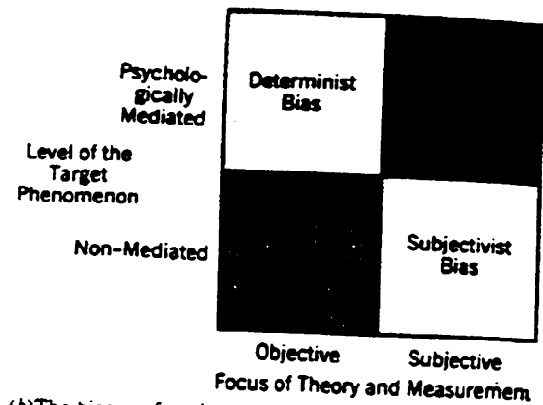

MANAGEMENT CONCERN

Figure 2.7. In the Hawthorne Studies by Roethlisberger & Dickson (1939), the contextual factor of management concern altered the meaning of the physical stimulus to the employees participating in the research.
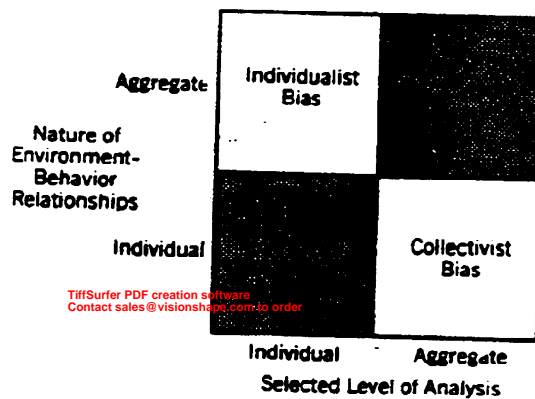
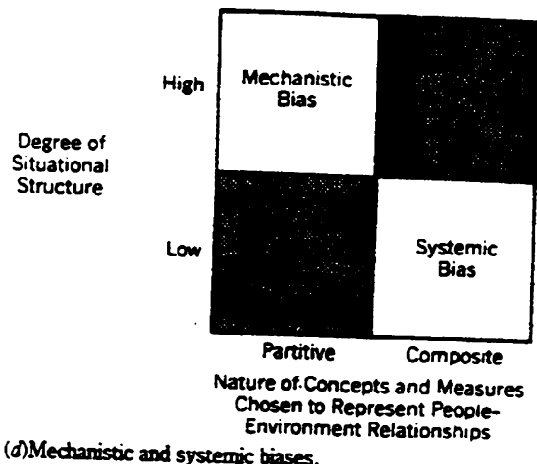(a)The biases of low explanatory power and inefficiency of conceptualization.

(b)The biases of environmental determinism and extreme subjectivism.

(c)Individualistic and collectivist biases.

(d)Mechanistic and systemic biases.

Figure 2.8. Research biases resulting from a mismatch between the scope, level, and focus of contextual analysis and the range of situational factors affecting the target phenomenon. The shaded cells denote low levels of bias and high congruence between the type of analysis chosen and the complexity of the target phenomenon.

between people and their surroundings (cf. Altman & Rogoff, Chapter 1, this volume).

The four dimensions of contextual analysis and the corresponding categories of bias summarized in Figure 2.8 suggest certain general strategies of theorizing for enhancing the scientific and practical value of environment and behavior research. These conceptual and procedural strategies are outlined below.

2.3.6. Summary of Strategies for Developing Contextual Theories and Research

Contextual theorizing, as described in the preceding sections of the chapter, is a process involving two basic phases: (1) a *contextual mapping phase*, in which environmental and behavioral target variables are examined within increasingly broad segments of the individual's (or group's) spatial, temporal, and cultural milieu; and (2) a *contextual specification phase*, in which the researcher attempts to define, on the basis of the initial exploratory phase, those situational dimensions that are most crucial for understanding the target phenomenon. The major goal of the first stage is to discover potentially important contextual moderators of the target variables. The major goal of the second phase is to delimit and define, as specifically as possible, the effective context of the target phenomenon.

Too often in psychological research, the exploratory mapping phase of contextual theorizing is by-

passed. In an effort to maximize the construct validity and clear operationalization of research variables, investigators may prematurely narrow the contextual scope of their analysis and move too quickly to a specification of predictor variables and response criteria. The present discussion suggests, however, that the validity, power, efficiency, and generativity of our theories are highly dependent on the effectiveness of the contextual mapping process, whereby a particular phenomenon is analytically rotated or charted in relation to several dimensions of contextual representation.

Having considered some of the distinguishing features of contextual theories and criteria for evaluating them, it is possible at this point to specify a number of programmatic assumptions that can serve as *guidelines for developing contextual theories and research*:

1. The specification of contextual moderator variables should become an inherent part of psychological theorizing. The contextual mapping and specification stages of theorizing, when coupled with cross-setting empirical research, can provide a broader understanding of the generalizability of our theories and research than can strictly inductive assessments of external validity alone.

2. It is important for psychologists to shift their focus from an exclusive emphasis on people's reactions to discrete stimuli and events to the ways in which these phenomena are qualified by the behavior settings, life domains, and overall life situations in which they occur. An advantage of adopting contextually broader units of analysis is that they permit an assessment of the interrelationships among environmental conditions, activities, and experiences that occur within and across different life domains.

3. Psychological phenomena should routinely be examined in relation to temporal dimensions of context. This temporal mapping process should involve a consideration of the ways in which the history of an individual or group and its anticipation of the future qualify their experience of, and response to, immediate environmental conditions.

4. It is important to avoid the tendency toward psychological reductionism (cf. Sampson, 1981) that characterizes many behavioral theories and to consider systematically the sociocultural dimensions of individual and collective behavior.

5. It is useful to examine the effective context of a target phenomenon from the perspective of both individuals and groups. In many instances, the combined use of individual and aggregate representations

of context can provide the basis for a broader understanding of the target phenomenon.

6. The combined use of objective and subjective representations of context can reduce two sources of biases in psychological research: the tendency to interpret people's behavior entirely in relation to the objective features of their physical and social environments; or, at the other extreme, the failure to consider the direct (or nonpsychologically mediated) effects of environmental conditions on behavior. A systematic analysis of the objective features of the environment as well as people's subjective appraisals of their surroundings can contribute to the development of theories that are sensitive to two types of contextual effects on behavior: those that are mediated by cognitive or interpretive processes, and those that are not.

7. It is important that our representation of contextual factors in either partitive or composite terms be commensurate with the degree and quality of interdependence that exists among people, their activities, and places. In certain loosely organized situations, the relationships between environment and behavior may be represented most usefully in terms of the interactions among independent variables. In other situations, however, the form and occurrence of environment–behavior relationships may be more dependent on the composite or structural features of the setting. The selective and appropriate use of partitive and composite constructs can help avoid a haphazard, atheoretical approach to the description of environments and can encourage, instead, a more systematic, theoretically based assessment of the cross-situational generality of our theories and research.

I now turn to a consideration of the ways in which these strategies of contextual theorizing can contribute to the policy relevance and applied utility of environment and behavior research.

2.4. USING STRATEGIES OF CONTEXTUAL THEORIZING TO ENHANCE THE EFFECTIVENESS OF COMMUNITY INTERVENTIONS

An additional criterion for evaluating contextual theories that has not yet been discussed is their *applied utility*, or the degree to which they contribute to an understanding of community problems and suggest guidelines for developing effective policy interventions. The applied utility of a theory depends fundamentally on the criteria of contextual validity, relative power, and generativity, discussed earlier.
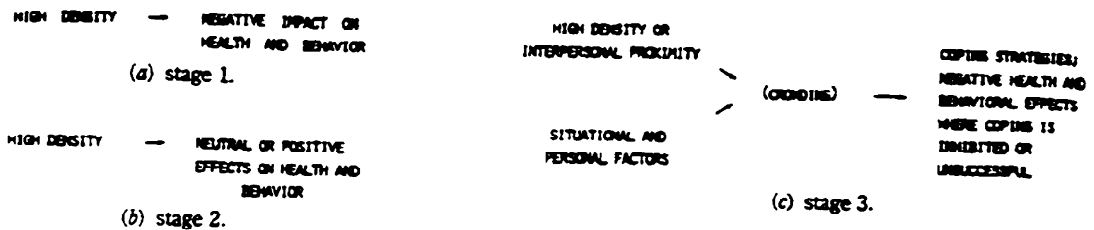
Figure 2.9. Different theoretical orientations of three stages reflected in the research literature on crowding and behavior.

But the utility of a theory is also influenced by the complexity of the policy-making process and the structure of the situations in which the interventions derived from the theory will be implemented. To be useful, then, a theory must validly specify the situational conditions under which a particular set of environment–behavior relationships will hold. But the contextual conditions specified by the theory also must be relevant to the structure of the intervention setting.

To illustrate the relationship between the contextual validity and utility of a theory, consider some examples drawn from the research literature on crowding. Elsewhere (Stokols, 1978b) I have suggested that the research on human crowding during the 1960s and 1970s can be characterized in terms of three conceptual stages. The earliest stage of crowding research consisted primarily of naturalistic studies of animal populations living under conditions of extremely high density (e.g., Calhoun, 1962; Christian, Flyger, & Davis, 1960), and sociological analyses of the relationships among levels of density, crime, suicide, and disease within different urban areas (e.g., Schmitt, 1957; Winsborough, 1965). Both lines of research indicated a significant relationship between high levels of density and behavioral pathology. Thus studies conducted during the first stage of research supported the deterministic position that high density is invariably harmful to human well-being (see Fig. 2.9a).

The second stage of crowding research commenced with a series of experiments conducted by Freedman and colleagues (Freedman, 1975; Freedman, Klevansky, & Ehrlich, 1971). In these experiments, groups of people were exposed to either large or small laboratory rooms while their task performance and social behavior were observed. The consistent finding from this research was that high density did not affect task performance and altered social behavior only slightly, with female group members showing a higher tolerance for spatial limitation than males. This line of research, along with addi-

tional survey research that controlled for socioeconomic confounds with census tract density (e.g., Mitchell, 1972), supported a different conclusion than the one suggested by the first research stage: namely, that high density, when isolated from other situational circumstances that often accompany it (e.g., poverty, heat, noise, unpleasant odors), does not lead to stress among people (see Fig. 2.9b).

Despite the optimistic conclusions of these social psychological and survey studies, the fact that people often regard high density as unpleasant suggested that a still more detailed analysis was required to determine when and where people experience stress under conditions of limited space. Thus the third stage of crowding research was marked by the development of theoretical models that distinguished between the physical condition of density, or limited space, and crowding, a type of stress that arises when proximity with other people creates distracting stimulation or infringements on one's privacy and behavioral freedom (cf. Altman, 1975; Baum & Epstein, 1978; Stokols, 1976). These contextually oriented theories attempted to specify the conditions under which high density does or does not lead to negative impacts on health and behavior. Both the theories and the findings from this third stage of research supported the nondeterministic view that high density (or proximity with other people) does not necessarily impair health and behavior. Only to the extent that density, in conjunction with other situational and personal factors, leads to the experience of crowding will it have negative effects on health and behavior (see Fig. 2.9c).

The policy implications of these three stages of research were, of course, different. The message conveyed to community planners by the first stage of research was: "Avoid high-density buildings and neighborhoods at all costs." By contrast, the design implication of studies from the second stage was: "High density has very little impact on people and, therefore, can be regarded as an unimportant factor in urban planning." And findings from the third stage

160

of research conveyed yet another message to planners, namely: "High density sometimes affects people adversely and sometimes favorably. The particular effects of density in any given situation will depend on the type of environment being designed and the psychological and social attributes of its prospective users."

These examples illustrate that *the effectiveness of public policies depends largely on the adequacy of the theoretical assumptions from which they are derived.* Theories that fail to specify the contextual qualifiers of a phenomenon may appeal to policymakers by virtue of their simplicity. But the low contextual validity of such theories jeopardizes their effectiveness to the extent that they are applied within settings that exceed the situational boundaries of the proposed target variable relations.

The present analysis of the applied utility of theories further suggests that contextual theorizing can help not only to specify the situational moderators of a particular phenomenon, but also to understand the complexity of the intervention situation itself. There are at least two aspects of this complexity that can be usefully approached from a contextual perspective. The first concerns the relative efficacy of alternative leverage points for environmental and behavioral interventions with a particular setting and time interval. The second concerns the identification of appropriate criteria for judging the cost-effectiveness of the proposed intervention.

An excellent example of the applied utility of contextual analysis is provided by Stern and Gardner's (1981) discussion of psychological research and energy policy (see also Stern & Oskamp, Chapter 28, this volume). A unique feature of Stern and Gardner's analysis was their assessment of national energy consumption across household, industrial, commercial, and other sectors and across different energy uses within the household domain. They also identified the kinds of behaviors (e.g., the purchase of a fuel-efficient car) that have the greatest impact on the amount of energy consumed by a household. And by moving from an individual to an aggregate level of analysis, Stern and Gardner were able to identify potential targets for energy conservation programs other than the individuals comprising a household such as government leaders within a community and the executive boards of large corporations. Stern and Gardner's description of the context of energy consumption indicated that the majority of national energy use occurs outside the household sector and that, within the household, transportation-related and space-heating uses account for the largest pro-

portion of energy expenditure. Thus by examining energy consumption in relation to different sectors of the economy and from the perspective of individual and aggregate systems Stern and Gardner were able to suggest a variety of intervention points at the community level that would have been missed by a contextually narrower analysis.

The specification of criteria for judging the cost-effectiveness of community interventions also can be enhanced through the application of contextual mapping strategies. Consider, for example, the development of corporate ride-sharing programs to alleviate commuter stress and to improve organizational effectiveness. Again the proposed intervention can be analyzed in relation to alternative representations of the environment as viewed from the perspective of individuals, aggregates, or both. The cost-effectiveness of corporate vanpooling programs might be evaluated differently depending on whether the target phenomenon of interest was commuter stress and well-being, organizational effectiveness and profitability, or the quality of life at a community level. At the first level, an evaluation of the proposed program would involve an individually oriented analysis of the travel conditions and stress levels experienced by participants in the vanpooling program and among a comparable sample of automobile commuters. At an organizational level of analysis, the cost-effectiveness of the vanpooling program might be assessed in relation to aggregate levels of employee morale, productivity, illness-related absence from work, and attrition. And at the community level, the effectiveness of the program could be measured in terms of its impact on residents' aggregate perceptions of traffic congestion and ambient noise levels in their neighborhood (cf. Appleyard, 1981). Only by considering the proposed intervention in relation to individual as well as aggregate levels and subjective as well as objective descriptors of the environment can the appropriate criteria of cost-effectiveness be identified and understood.

The present discussion of the applied utility of contextual theories and research neglects several important issues such as the political, legislative, and economic forces that impinge on the policy-making process and thereby influence the effectiveness and implementability of our proposed interventions (cf. DiMento, 1981; Kantrowitz & Seidel, 1985; Wohlwill, 1981; Zube, 1980). Nonetheless the preceding examples illustrate several of the advantages that can accrue from the systematic application of contextual theorizing and research to an analysis of policy issues.

2.5. DIRECTIONS FOR FUTURE THEORIZING AND RESEARCH

The preceding sections of the chapter have described several strategies for developing contextual theories and for evaluating their scientific and practical utility. All of these strategies rest on a basic assumption: that the usefulness of our theories and research depends on the extent to which they correctly identify the effective (or influential) context of the target phenomenon. Under certain circumstances, however, the goal of identifying the effective context of a phenomenon may be unwarranted. It is important at this point in the chapter to mention some critical qualifications of the proposed strategies of contextual analysis, and to consider certain priorities for future theorizing and research that are raised by these issues.

One factor that limits the usefulness of the proposed strategies is the *relative stability (or instability) of the relationships between the target and contextual variables*. Because the transactions between people and their surroundings are intrinsically dynamic rather than static, the effective context of environment—behavior phenomena is never perfectly stable—that is, the important situational moderators of a phenomenon can be expected to shift across time, places, and cultures. The key question, however, is how rapidly and predictably these changes in the effective context occur. For those phenomena that are relatively stable, efforts to identify generalizable relationships between the target and contextual variables would be warranted on both scientific and practical grounds. But for those forms of person—environment transaction that are characterized by very rapid rates of change, efforts to specify the effective context of the target phenomena might prove to be highly impractical.

For example, earlier research on commuting and stress suggests that the relationships between travel distance and various measures of physiological and emotional well-being are moderated by situational factors such as the level of overcrowding when passengers first board their train (cf. Singer, Lundberg, & Frankenhaeuser, 1978); or the degree to which automobile commuters are satisfied with their residential and work domains (Stokols & Novaco, 1981). To the extent that contemporary patterns of commuting in urban areas continue into the future, the observed links between the target variables of travel distance and stress and the above-mentioned contextual factors would be expected to remain relatively stable. If, on the other hand, current commuting patterns are substantially transformed by the growing trends

toward "telecommuting" and doing work at home (Olson & Primps, 1985), the provision of child-care facilities within corporate settings (cf. Michelson, 1985; Naisbitt & Aburdene, 1985), and the availability of mobile telephone systems that permit direct communication between the commuting and destination points (Toffler, 1980), then the previously recorded links between travel distance, situational factors, and stress are likely to change as well.

Thus an important direction for future research is the development of *transformational theories*, or those that suggest the circumstances under which people—environment transactions are likely to undergo fundamental and rapid change (cf. Stokols, 1986). Examples of transformational analyses are recent discussions of the geographical, social, and psychological factors that encourage the formation, modification, or termination of behavior settings (cf. Stokols & Shumaker, 1981; Wicker, Chapter 16, this volume) and Saegert's (Chapter 4, this volume) analysis of the ways in which researchers contribute to fundamental social change through the very process of studying the relations between people and their environments. Each of these analyses focuses directly on the sources and rates of change in people—environment transactions. To the extent that we develop a better understanding of how, when, and why human environments change, we will be able to estimate the relative stability of the hypothesized (or observed) relationships between a particular set of target and contextual variables.

A related factor that qualifies the proposed strategies of contextual analysis is the *varying influence of chance factors on environment–behavior phenomena*. Whereas it might be possible to predict the timing and direction of certain changes in the relations between people and their environments, other changes will occur in a much more spontaneous or random fashion. Given that many facets of person—environment transaction are *chance-dependent* (Gergen, 1982; Maruyama, 1963), does it make any sense to develop contextual theories that posit generalizable links between a target phenomenon and one or more situational factors? The answer to this question depends on the presumed likelihood that chance factors will exert a relatively major (or minor) influence on some facet of environment and behavior, within a given temporal, spatial, or cultural context.

Although the exact nature and timing of chance factors cannot be reliably predicted, it may be possible to identify certain forms or phases of person–environment transaction that are especially susceptible to influence by such factors. For example, the impact of chance factors on environment and behavior may

be particularly great during periods of geographic relocation, especially when such moves coincide with major life transitions (cf. Wapner. Chapter 41, this volume). Acutely stressful events that restructure a person's overall life situation (e.g., death of spouse and subsequent residential and employment change) may instigate numerous chance encounters with new settings and people that profoundly affect the future course of the individual's life (cf. Aldwin & Stokols, in press). If, in fact, the relative influence of chance factors varies across certain forms, phases, and contexts of person–environment transaction in some systematic fashion, then a potentially useful direction for future research is suggested: namely the development of theories that account for the situations in which chance factors play a major or minor role in shifting the course of environment–behavior relations.

A third set of issues that should be considered when using the proposed strategies of contextual analysis concerns the *importance of matching one's theoretical approach to the predominant goals and objectives of the research at hand*. The development of contextual theories that offer testable predictions about the links between target variables and situational factors makes most sense when the researcher is conducting inferential, comparative studies of two or more settings. On the other hand, the inferential (or *specification*) phase of contextual analysis may be less appropriate when a study is being conducted within a single setting to compile an in-depth, empirical description of environment–behavior relationships within that setting, alone; and for the purposes of developing new research questions or situation–specific proposals for environmental intervention. In both of these instances, the exploratory–mapping phase of contextual analysis could provide a useful framework for organizing one's research. But the more specific tasks of developing contextual theories and evaluating their validity, power, efficiency, and utility would be less appropriate within the context of single-setting, descriptive research. These aspects of contextual theorizing would be most powerful as a basis for multisetting, inferential research, especially where the relationship between the target and contextual variables can be expected to remain relatively stable within certain geographic, historical, and cultural boundaries.

A fourth set of issues that has received little attention in previous work is that group of *processes by which researchers develop hunches, hypotheses, and theories about the sources of situational influence on environment and behavior*. The proposed strategies of contextual analysis can help organize the search for

the situational moderators of a phenomenon, but they do not account for the creative connections that researchers make between the exploratory-mapping phase of their work and the subsequent framing of new concepts and relationships. The success of the researcher's efforts to develop a valid and powerful theory may depend not only on his or her personal characteristics (e.g., degree of familiarity with the phenomenon under study; creativity and insight), but also on a variety of situational factors that influence the theorizing process itself (cf. Gergen, 1985; Wicker, 1985; Weick, 1979). Future research on the process of contextual theorizing could address the following questions: (1) What aspects of the researcher's environmental experiences and social relations affect his or her selection of topics for theoretical and empirical study? (2) What contextual factors enhance the creativity and generativity of the theory development process? And (3) how might research and educational settings be organized to encourage creative and generative theorizing about environment and behavior?

2.6. SUMMARY AND CONCLUSIONS

In this chapter, I have examined several dimensions for representing the context of individual and group behavior that together offer a descriptive framework for developing theoretical constructs and community interventions. I have noted some of the distinctive features of contextual theories and have proposed criteria for evaluating their validity, power, efficiency, generativity, and applied utility. I also have characterized contextual theorizing as a two-phase process involving an initial exploratory or mapping phase and a subsequent specification and inferential phase. I have suggested several strategies by which these processes of theory development can be used to broaden our understanding of the contextual moderators of individual and collective behavior and to sharpen our assessments of the potential effectiveness of public policy proposals. Finally I have noted certain limitations of the proposed strategies and some related directions for future research.

The strategies of contextual analysis described in this chapter provide a descriptive framework to facilitate the discovery of potentially important constructs rather than a "surefire" set of formulas that guarantee the development of powerful and generative theories. Nonetheless, when applied to a wide range of environment and behavior issues, they can serve as a valuable tool for enhancing the validity and utility of our theoretical work, and for translating a broad

contextual perspective into operational guidelines for theory development, research, and community intervention.

Acknowledgments

NOTES

1. See Endler and Magnusson (1976) for a more detailed discussion of situationist, trait, and interactionist theories.

2. See, for example, the critiques of conceptual and methodological reductionism in behavioral research, presented by Gergen (1973, 1982) and Schwartz (1982). See also McGuire's (1983) distinction between *convergent* and *divergent* research styles.

Note that the spatial, temporal, and sociocultural dimensions of contextual scope can be considered separately for predictor and outcome variables. That is, the scope of the predictor variables might be wide while that of the criterion variables is narrow, or vice versa. Alternatively the scopes of both sets of variables might be broad or narrow.

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