PSPB, 1976, 2,350-358

# Social-Unit Analysis as a Framework for Research in Environmental and Social Psychology

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Abstract. The present discussion examines some of the theoretical assumptions implicit in Altman's (1976) concept of social-unit analysis. These assumptions are considered in relation to Miller, Galanter, and Pribram's (1960) "TOTE" model of human behavior and the concept of human-environment optimization (Stokols, in press). An attempt is made to specify certain core concerns of the environment and behavior field, and to examine the potential contribution of social psychology to an analysis of these concerns.

Altman's (1976) analysis of the relationship between environmental and social psychology is valuable both for participants in the environment and behavior field as well as for "mainstream" social psychologists. Of particular interest to the former group is Altman's examination of the philosophical underpinnings of environmental psychology, his substantive overview of the field, and his discussion of research priorities for the future. These offerings provide a useful set of conceptual and methodological "handles" on research in environmental psychology, an area characterized by rapid expansion and a diversity of content. For more traditional social psychologists, his article serves the important function of raising several questions about the current and future focus of social psychology. In this regard, Altman offers a number of provocative suggestions concerning the appropriate content, models of causality, and methodological strategies of social psychology, based on his assessment of emerging trends in the environment and behavior field.

A unique feature of environment-behavioral research noted by Altman is its emphasis on the holistic analysis of "place x people units." The focus of this research orientation is on the dynamic functioning of individual, group, and community systems rather than on molecular categories of behavior (e.g., conformity, attitude change, social perception). Altman's contention is that social psychological research typically reflects a molecular-behavioral orientation which fails to consider the systemic organization of various behavior modalities within individuals and groups. Therefore, he proposes a shift of emphasis in social psychological research from a molecular orientation to a social-unit perspective.

Altman's discussion of social-unit analysis illustrates the potential contribution of environmental psychology to social psychology, and at the same time, raises some interesting questions about the future conceptualization of the environment and behavior field. Specifically, the questions are these: (1) Does social-unit analysis suggest specific principles of behavioral organization which account for the dynamic patterns of interaction among human systems and their environments? (2) Are the theoretical concerns of social-unit analysis conceptually distinct from those of traditional areas of psychological research or do they represent merely an area of interest within applied social psychology? And, (3) in what ways might the theories and research

strategies of social psychology contribute to the development of an integrated field of environment and behavior? These questions are addressed below.

Theoretical assumptions underlying social-unit analysis. An important assumption of social-unit analysis is that the multiple behaviors of individuals and groups are organized in relation to system-defined goals. This assumption is more implicit than explicit in Altman's discussion. A further consideration of goal-optimization processes in human systems, however, might help to identify some of the unique theoretical concerns of environment-behavioral research, and the potential contributions of social psychology to the development of this research.

The assumption that personal and social systems attempt to optimize specific goals is reflected quite clearly in several areas of social psychology, as in research on conflict resolution (cf., Adams, 1976; Deutsch, 1973), social learning processes (cf., Rotter, 1954; Rotter, Chance & Phares, 1972), and social evaluation (cf., Pettigrew, 1967; Thibaut & Kelley, 1959). An emphasis on goal-optimization processes is especially evident in Miller, Galanter, and Pribram's (1960) "TOTE" (i.e., "test-operate-test-exit") model of human behavior. The model assumes that the actions of a person are continuously guided by his images of the environment, his plans for attaining specific goals in the environment, and the outcomes of his behavior. TOTE units are essentially feedback loops through which particular plans are enacted, tested, and terminated upon completion. Behavior patterns are comprised of hierarchically arranged TOTE units which occur in a cyclical fashion.

The TOTE model offers a basis for extending Altman's concept of social-unit analysis. First, it suggests three basic modes of human transaction with the environment: (1) orientation, (2) operation, and (3) evaluation (cf., Stokols, in press). These processes reflect the active role taken by people in perceiving, shaping, and evaluating their surroundings according to their needs. Second, the model suggests that the various phases of human-environment interaction occur sequentially. These suggestions pose several implications for the study of human systems from a social-unit perspective. Most importantly, they imply that the activity patterns of individuals and groups are most fully understood when considered in relation to the hierarchically-arranged goals of the system, and within empirically specified intervals or cycles of goal-optimization.

While Miller et al.'s model suggests certain extensions of Altman's social-unit approach, it provides a rather limited framework for future research on environment and behavior. A major limitation of the TOTE model is its exclusive focus on person x environment interactions. The processes by which groups interact with the environment are ignored. Furthermore, the TOTE model does not address what is perhaps the major substantive concern of environment-behavioral research: i.e., the relationship between human systems and the molar physical environment. Further consideration of this concern in the ensuing discussion reveals

certain optimization issues which typically are not considered in social psychological research, and suggests a theoretical focus for future research on environment and behavior.

Basic concerns of the environment and behavior field. The characterization of a research area as a scientific field implies that it can be distinguished from other areas of inquiry in terms of its unique theoretical and/or operational features. On the one hand, the term "field" can refer to Kuhn's (1962) notion of a paradigm, or "universally recognized scientific achievements that for a time provide model problems and solutions to a community of practitioners" (p. viii). On the other hand, it can refer to the operational definition of a research domain in terms of the unique concerns and activities of those scientists who identify with the area (cf., Proshansky, Ittelson & Rivlin, 1970, p. 5).

The diversity of interests reflected among environment and behavior researchers and the recency of their collective identity presently precludes any identification of the "model problems and solutions" to which Kuhn refers. Nonetheless, as Altman's article demonstrates, it is currently possible to develop an operational characterization of the environment and behavior field in terms of the unique concerns encompassed by ecological psychology (or behaviroal ecology; cf., Barker, 1968; Wicker & Kirmeyer, in press; Willems, in press) and environmental psychology (Altman, 1976; Craik, 1970; Mehrabian & Russell, 1974; Proshansky, Ittelson, & Rivlin, 1970; Wohlwill, 1970). Both of these areas are directly concerned with the relationship between human behavior and elements of the architectural and natural environment. Ecological psychology emphasizes the collective processes by which groups adapt to the physical and social resources available in the environment, while environmental psychology focuses more on intrapersonal processes, such as perception, cognition, and learning which mediate the impact of the environment on the individual.

Interestingly, the diverse areas of environment and behavior research identified by Altman can be categorized in terms of the three processes of human-environment transaction mentioned earlier: orientation, operation, and evaluation. An emphasis on the ways in which people orient toward the environment, for example, is reflected in recent research on environmental perception (cf., Ittelson, 1973), cognitive mapping (Downs & Stea, 1973; Kaplan, 1973; Lynch, 1960), the assessment of personal dispositions toward the environment (cf., Craik, 1976; McKechnie, 1974), and the measurement of social climate (cf., Moos, 1972; Insel & Moos, 1974). An emphasis on operation processes, or the ways in which people act upon and are affected by their surroundings, is reflected in recent research on human spatial behavior (cf., Altman, 1975; Edney, 1976; Hall, 1966; Sommer, 1969; Stokols, 1976; Sundstrom, 1976), undermanning and overmanning (cf., Barker, 1968; Wicker, McGrath & Armstrong, 1972; Willems, in press), and the behavioral effects of environmental stressors such as noise (Glass & Singer, 1972; Cohen, Glass, & Singer, 1973), high density (Freedman, 1975; Rapoport, 1975; Sherrod, 1974; Stokols, 1972; Zlutnick & Altman, 1972), and pollution (Swan, 1970). Finally, evaluation processes, or the ways in which

people assess the effectiveness of their past behavior and the opportunities afforded by the environment for future goal-attainment, have been emphasized in research on environmental assessment and simulation (cf., Craik, 1971; McKechnie, in press; S. Kaplan, in press), landscape preference (cf., Craik, 1972; R. Kaplan, in press; Zube, in press) and social impact assessment (cf., Catalano, Simmons, & Stokols, 1975; Wolf, 1974, 1975).

The array of research topics outlined above reflects some of the substantive and procedural emphases of the environment and behavior field: i.e., (1) its ecological or multi-level emphasis on the relationship between groups and individuals to the largescale environment; (2) its "interactionist perspective" (cf., Bem & Allen, 1974; Bowers, 1973) on behavior which emphasizes intrapersonal mediators of environmental impact; and (3) its community-problems and (4) interdisciplinary orientation as reflected in research topics such as noise, crowding, and architectural evaluation.

The above outline of the field, however, does not specify any core conceptual issues which distinguish its theoretical concerns from those of applied social psychology or other areas of behavioral science research. At present, the concerns of the environment and behavior field are more appropriately represented in operational rather than theoretical terms (cf., Proshansky & O'Hanlon, in press; Smith, in press). I would suggest, however, that an integration of Miller et al.'s TOTE model of behavior with Altman's social-unit analysis may reveal certain theoretical questions whose eventual resolution could provide the basis for developing an integrative conceptualization of the field.

In an earlier paper (Stokols, in press), I have suggested that the environment and behavior field is uniquely concerned with the processes of human-environment optimization, or the ways in which individuals and groups strive to achieve "optimal environments" — those that maximize the fulfillment of their needs and goals. The notion of human-environment optimization integrates two major emphases of the environment and behavior field noted earlier. First, the systems-theoretical or social-unit perspective of ecological psychology is extended to the micro level of analysis in the sense that individual behaviors relating to orientation, operation, and evaluation are viewed as part of a systematic and sequential strategy of person/environment optimization (e.g., the sequential models of crowding proposed by Altman, 1975; Stokols, 1972; and Sundstrom, in press). Second, the emphasis of environmental psychology on intrapersonal processes of orientation, operation, and evaluation is extended from an individual level of analysis to group and community levels. Specifically, it is assumed that social systems, like individuals, delineate hierarchical goals and plans which provide criteria for systematic assessment and modification of the largescale environment (cf., Wolf's 1974, 1975 research on social impact assessment).

The environmental optimization theme thus extends earlier theories of human motivation (e.g., Kelly, 1963; Maslow, 1954; Miller et al., 1960) which typically focus on the individual's attempts to optimize his immediate social environment. Human-environment optimization refers to processes enacted by individuals, small groups, organizations, and

whole communities, and is oriented toward improvement of the molar physical environment as well as its more molecular components. It should also be noted that the environmental optimization theme extends earlier notions of "behavior-environment congruence," or the association between particular patterns of behavior and specific environmental conditions (cf., Barker, 1968; Michelson, 1970; Mischel, 1973; Wicker, 1972). Most importantly, optimization processes refer to goal-directed and cyclical patterns of behavior rather than actual or perceived states of environmental congruence. Moreover, environmental-optimization processes are inherently comparative and design-oriented -- the structure and functioning of a given setting is evaluated against predefined standards of environmental quality.

At present, the concept of human-environment optimization is simply a unifying theme reflected in many areas of environment-behavioral research, rather than a theory of human-environment transactions. Nonetheless, the optimization theme is useful as a theoretical tool in at least two respects: (1) it serves to specify and extend some of the theoretical assumptions implicit in Altman's social-unit analysis, and (2) it suggests a number of questions for future research, the analysis of which may help to delineate a comprehensive theory of human-environment transactions.

Future development of the environment and behavior field: The potential contribution of social psychology. Some of the key questions posed by the concept of human-environment optimization are as follows: (1) On what dimensions do people attempt to optimize their environment? (2) Do the salient dimensions of environmental optimization vary systematically in relation to the type of setting considered? (3) What kinds of assessment criteria are appropriate for measuring optimization processes and their outcomes at individual, group, and community levels of analysis? (4) What are the appropriate time intervals for assessing optimization cycles within individuals, groups, and communities? (5) To what extent can competing goals be optimized both within and between systems? (6) In what ways can empirical information concerning human-environment optimization be translated into guidelines for environmental design?

Although the concern of these questions with the largescale environment is novel vis-a-vis the usual concerns of social psychologists, virtually all of the questions can be approached in terms of social psychological theory and research strategies. For instance, several theories are relevant in attempting to specify important dimensions of environmental optimization. A direct implication of attribution theory, for example, is that people strive to arrange their surroundings in ways that facilitate the formation of stable attributions about other people and the environment, in general (cf., Bem, 1967; Heider, 1958; Kelley, 1967). Also, social evaluation theory might be usefully extended to a consideration of those factors which affect the development of comparison levels regarding environmental quality within individuals as well as groups (cf., Thibaut & Kelley, 1959). And theories of interpersonal and intergroup conflict could be utilized in analyzing the dynamics of environmental optimization within individuals, groups,

and communities characterized by a diversity of competing goals (cf., Adams, 1976; Deutsch, 1973). Finally, recent research in the area of program evaluation (e.g., Campbell, 1969; Struening & Guttentag, 1976; Wortman, 1975) is directly relevant to a consideration of the appropriate assessment criteria and intervals for measuring optimization processes within organizations and communities, and the issue of translating environmental-optimization data into guidelines for community planning.

The present discussion has addressed only a small proportion of research in environmental and social psychology. Hopefully, however, it has served to identify certain core concerns of the environment and behavior field through an extension of Altman's social-unit analysis, and to illustrate some of the potential contributions of social psychology to an analysis of these concerns.

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