



# An ecological perspective on theory, methods, and analysis in environmental psychology: Advances and challenges

Gary Winkel<sup>a,\*</sup>, Susan Saegert<sup>a</sup>, Gary W. Evans<sup>b</sup>

<sup>a</sup>City University of New York, NY, USA

<sup>b</sup>Cornell University, Ithaca, NY, USA

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## ABSTRACT

Over the course of environmental psychology's brief history, there has been an interest in ecologically oriented approaches to theory and research. Based on this work, this paper identifies a set of six principles of ecological analysis that present theoretical, methodological, and analytic challenges to future research in environmental psychology. These challenges include the theoretical treatment of the multiple contexts within which human experience and behavior occurs, the need for sampling both persons and environments, the modeling of moderating and mediating processes, the issue of self-selection into and out of different settings, the necessity of considering temporal factors in environmental research, reliance on single methods (e.g., verbal report) in data generation, cross-sectional and longitudinal research designs, and the need for greater use of statistical techniques developed for contextual (multi-level) research. These issues are discussed and illustrated using recent developments in environmentally oriented research. The paper concludes with a set of 11 recommendations for the future.

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## 1. Introduction

In this paper, we argue that environmental psychology (EP) has been moving toward a more ecologically oriented perspective on person/environment relations. Within this ecological framework, we address the advances that have been made and the challenges that confront an ecologically oriented EP in the areas of theory, methodology, and data analysis. We offer recommendations compatible with the principles that characterized the discipline's formative stages and, hopefully, we provide a framework for the field's continued development.

Over the course of EP's development, there has been a consistent emphasis on: (1) theoretical and empirical analyses of the role of the physical environment in human behavior; (2) the contextual nature of human experience and action within physical settings; (3) the adoption of methodologies that map onto the complexities of person/environment relations; (4) the utilization of data analytic strategies that reflect the contextual nature of person/environment relations; (5) the implementation of a multi-disciplinary approach to EP; (6) the need for theory and research that addresses real world problems. In this paper, we focus on

a set of particularly relevant to the elaboration of the first through the fourth themes.

## 2. Theoretical orientations to person/environment relationships

### 2.1. Background

By contrast to the situation in which there were few environmentally oriented theories at the field's beginnings in the late 1960s, at least four clearly defined theoretical orientations based on the work of psychologists and those in other disciplines could be identified as early as 1990 (Saegert & Winkel, 1990). One of these theoretical perspectives involved the development of ecological theories and multi-level concepts of the environment (Altman & Rogoff, 1987; Cohen, Evans, Stokols, & Krantz, 1986; Lawton, 1987) and this work continues (Heft, 2001).

Based on the efforts of these scholars, we believe that it is possible to identify a distinctively ecological perspective within EP theory. Six principles of ecological analysis that will be discussed further below with regard to their theoretical, methodological, and analytic implications concern: (1) the critical reexamination of the objective–subjective dichotomy that has characterized disputes about the role of quantitative and qualitative research in EP; (2) the recognition that psychological processes are embedded in physical,

\* Corresponding author. Tel.: +1 212 817 8724.

economic, and social contexts; (3) the unfolding and articulation of person–environment dynamics over time; (4) the levels of analysis that make provision for the reciprocal relationships that exist between individual agents and the environmental/social contexts within which individuals are embedded; (5) the necessity of nesting the individual in larger ecological units including cultures, social groups, and geographic terrains (Bronfenbrenner & Morris, 1998; Cohen et al., 1986); and (6) the understanding that person-based variables (e.g., gender, personality, stage in life course, environmental belief systems) can shape the nature of human responses to and actions taken with regard to the physical environment.

With regard to the first principle, it should be noted that ecological psychology superficially appears to stress the objective aspects of the environment rather than those that are subjective (Gibson, 1979; Heft, 2001). However, that dichotomy oversimplifies the radical empiricist and pragmatist roots of these theories which emphasize the emergence of particular realities through transactions among people and the environment over time (Heft, 2001; Werner, Brown, & Altman, 2000). Within this perspective, the subjective/objective distinction might better be understood as a continuum ranging from observable to any trained observer through perceptible only to the person being studied.

For example, some phenomena of interest to environmental psychological researchers may be studied without recourse to the persons' experience as when measures of cortisol are related to observations of the number of people per unit of space, decibel sound readings are linked to reading acquisition, or public records such as census or police data are associated with morbidity and mortality. Other phenomena may lie entirely in the domain of personal experience as, for example, the relationship of perceived social support to subjective well being over time. In these examples, it is not that one representation is truer but rather that each provides a specific representational form of person–environment states that inform us about person–environment relationships. Each representation has strengths and weaknesses that influence conclusions about person/environment relationships.

The remaining principles of ecologically oriented theories have implications for methodology in that they render the problematic use of purely qualitative or purely experimental interpretations of measurement if the goal is both to understand person/environment relationships that may be out of awareness and to act on these understandings to make improvements possible.

For example, quantitative EP research often fails to capture key components of these theories because of its focus on single, isolated variables, inadequate representations of the physical and social contexts in which individuals are embedded and act, insufficient attention to the psychological processes that intervene between the physical environment and the person, and limited efforts to include multiple levels of analysis both in measurement and statistical models.

By contrast, qualitative research strategies that make theoretical statements regarding the multifaceted, reciprocally causal, and embedded nature of person–environment relationships as the main focus of inquiry would appear to be more promising. However, while attractive in this regard, qualitative approaches are subject to other limitations. These include: (1) small samples of unknown generalizability that often fail to distinguish between that which is general and that which is unique in the person's experiences and behaviors; (2) overly complex representations having so many constructs and processes that both theory and practice are compromised; (3) reliance on verbal accounts as the only representation of both the environment and people's experiences; and (4) the tenuous and implicit assumption that the person is both aware of and able to identify accurately those aspects of the environment that affect both experience and behavior.

Despite the shortcomings of both qualitative and quantitative research traditions, it is important to recognize their latent strengths as well. Therefore, the criteria for the evaluation of research in EP are based on the insights and critiques advanced by quantitative as well as qualitative researchers. We think that an understanding of person/environment relations can be advanced if we: (1) state our hypotheses about relationships between person and environment in a form that can be falsified by evidence; (2) use multiple methodologies that map onto the problem of interest; (3) measure variables at different scales (from physiology to larger scale physical and social contexts); (4) use quantitative techniques to evaluate the relative importance of various complex interdependencies among people and environments; (5) give greater attention to the identification of salient processes and variables grounded in qualitative methods that both mediate and moderate environmental influences on experience and behavior; and, finally, (6) examine the temporal dynamics (e.g., duration, continuity, stage in life course) of these contextualized human/environment relationships.

While the principles of ecological psychology have not as yet been integrated into a comprehensive theoretical treatment of person–environment relationships, they can be used to illustrate recent advances and to highlight challenges for the future.

## 2.2. Theoretical advances and challenges

Within the last 10 years, there has been an increasing use of contextual (multi-level) models to account for individual experience and behavior. This development represents an advance over earlier EP research. The challenges involve the role of social and physical contextual factors in conceptual systems and the modeling of processes.

### 2.2.1. Contextual models

Contextual models are based on the disarmingly simple premises encapsulated by the fourth and fifth principles of ecological psychology discussed above, i.e., that individual experiences and behaviors occur in larger physical and social contexts that may be expected to affect them. While seemingly straight-forward from a research design perspective, the analysis of data from these studies presents some statistical challenges that are discussed below.

Although the literature in this area is not extensive, contextual models using physical environment variables have been used to address a number of important individual outcomes. For example, comparisons of the social and physical predictors of various outcomes have shown physical environment variables to be significant predictors of gonorrhea rates (Cohen et al., 2000) and all cause mortality in 107 U.S. cities (Cohen, Farley, & Mason, 2003; Cohen, Mason et al., 2003). The latter study replicated the earlier gonorrhea findings. Using data from Chicago, Cohen, Farley et al. (2003), Cohen, Mason et al. (2003) reported that physical deterioration (net of demographic and neighborhood social characteristics) was a significant predictor of all cause mortality, cardiovascular mortality, and homicide but not, as would be expected, of mortality from malignant neoplasms. Evans (2006) has documented the evidence linking the physical environments experienced by children to both their physical health as well as various behavioral outcomes.

Another area of active research involving the contextual role that the physical environment plays focuses on criminal activity. Perkins and Taylor (1996) found that physically disordered environments predicted individual fear of crime net of socioeconomic characteristics while Brown, Perkins, and Brown (2003) reported significant negative relationships between disordered physical

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