RELATIONS BETWEEN PSYCHOLOGY AND GEOGRAPHY

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ABSTRACT: The special issue of *Environment and Behavior,* "Relations Between Environmental Psychology and Allied Fields," edited by Seymour Wapner (1995) contained seven articles exploring the links between environmental psychology and other subfields of psychology. The articles examined how environmental psychology with its emphasis on context "may serve to integrate psychology as a whole, and to bridge the gap between the interests of professionally orientated and academic psychologists" (Wapner 1995, p. 5). This article expands on this theme by exploring and summarizing the links between psychology and the allied field of human geography. It is suggested that an integrative framework needs to be adopted to capture the ways that these two disciplines, (and others such as planning and anthropology), have become complementary, and by doing so have provided a broader theoretical conceptualization of environment and behavior interactions.

A focus on physical, interpersonal, and sociocultural environments can neutralize the recent ongoing fragmentation in psychology, according to Wapner's (1995, p. 5) hypothesis. The

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special issue of *Environment and Behavior*, "Relations Between Environmental Psychology and Allied Fields," contained seven articles that explored the physical, interpersonal, and sociocultural environments in relation to other fields of psychology. However, environmental psychology's relationship to disciplines outside of psychology was neglected. In particular, the relationship to human geography, a discipline with a long tradition of studying environment and behavior interactions, was left unexplored. This article examines the historical and existing links between psychology and human geography. We detail how both psychologists and geographers are concerned with our behavior in physical environments and across space. Despite similar interests and a series of joint books (e.g., Downs & Stea, 1973, 1977; Gärling & Evans, 1991; Gärling & Golledge, 1993a; Golledge & Rayner, 1982; Moore & Golledge, 1976), collaborative research between psychology and geography has remained limited (Spencer & Blades, 1986). We argue that if we are to increase our understanding of behavior within large-scale, real world contexts it is essential for geographers and psychologists to develop collaborative links and adopt an integrative approach to study.

The aims of the article are therefore threefold. First, we aim to explicitly detail the historical, existing, and potential areas of study that geographers and psychologists share to demonstrate both potential areas of collaboration and sources of empirical studies/literature that might remain undiscovered. At present, we feel that both disciplines remain fairly insular and that psychologists, in particular, are generally unaware of the work undertaken by geographers. A glance through the bibliographies of articles by academics from both disciplines reveals little cross-disciplinary reading, with a few notable exceptions.

Second, we hope to promote greater cross-disciplinary collaboration, which we feel is vital for the development of environment and behavior studies. Both geographers and psychologists have much to offer each other, in terms of ideas, theory, and methodologies. We should appreciate that each discipline

approaches environment and behavior with a certain amount of preconceived notions and that collaboration will force many of us to reevaluate our positions and push back the boundaries of study.

Third, our goal is to advance an integrative approach that sees the merging of theory and practice from psychology and geography. We believe that, for environment and behavior studies to continue advancing at the current rate and to gain wider recognition within the parent disciplines, a sound theoretical framework must exist that unites the multidisciplinary base. This means that investigators have to seek out and develop appropriate integrative frameworks (Gärling, Lindberg, Torell, & Evans, 1991). Evans and Gärling (1991) have hypothesized that the integration of paradigms (environmental psychology and behavioral geography) concerning environment and behavior research may be a fruitful venture because it forces a more synthetic analysis that may reveal points of convergence and divergence among topics of scholarly inquiry. Such an integration might help to illuminate correct and incorrect models and hypotheses and to shed constraining or incorrect paradigmatic restrictions. The example they use is to study possible avenues for integrating environmental cognition, cognitive maps, environmental assessment, and environmental decision making and action from both environmental psychology and behavioral geography, in order to understand more fully our behavior in space. Hanson (1983) argues that

> Only through the process of communication among divergent points of view, will any semblance of convergence ever be achieved or maintained; through discourse the bits and pieces can be fitted into larger structures, and some degree of order emerges from the mess. . . . At the heart of this process of change is communication. (p. 35)

This article represents a renewed call for communication through the development of collaborative links.

A BRIEF HISTORY

Kitchin (1995) reports that most of the geographical flirtations with psychology have occurred since the middle of this century. Prior to that, indirect interaction occurred during the years of environmental determinism in geography (Huntington, 1915, 1945; Semple, 1911) and during periods of interest in topics such as spatial abilities and spatial orientation in psychology (e.g., Banerjee, 1928; Gulliver, 1908; Lund, 1930; Schaeffer, 1928; Trowbridge, 1913; von Senden, 1932; Worchel, 1951). Geographers such as Gilbert White (1945), John Wright (1947), David Lowenthal (1960), and William Kirk (1963), as well as less celebrated figures such as Hardy (1939), author of *La geographie psychologique*, were all early experimenters with the ideas of choice and action in the environment. It was not until the early 1960s, however, that some geographers started to take a wider interest in psychological theory and research techniques. These geographers realized that not everyone behaved in a spatially rational manner, and they became dissatisfied with the stereotyped, mechanistic, and deterministic nature of many of the quantitative theories and models being developed within their discipline at that time (Gold, 1980). These developments led to the formation of behavioral geography, which rather than being necessarily concerned with behavior itself, adopted a perspective that suggested the pattern of human phenomena on the Earth's surface was best understood by examining the thoughts, knowledge, and decisions that influence the location and distribution of those phenomena, rather than by studying the phenomena themselves, so that the investigations became process-driven (Golledge & Rushton, 1984). As such, those interested in behavioral approaches generally sought to apply ideas derived from (cognitive) psychology to environmental situations. Consequently, many geographers found themselves working alongside psychologists, who were simultaneously becoming increasingly interested in the molar environment and the development of relevant nonex-

perimental research techniques (Ward & Russell, 1981). These interdisciplinary flirtations led to representatives of 10 separate disciplines participating in a session at the 1965 Association of American Geographers' Conference in Columbus, Ohio; this ultimately led to the establishment of the Environmental Design & Research Association (EDRA) and to the beginning of this cross-disciplinary journal, *Environment and Behavior*, in 1969. In particular, developments in the early 1970s at Clark University, where several young geographers (Anderson, Blaut, Buttimer, Hart, Kates, McCleary, Rowles, Seamon) and psychologists (Moore, Stea, Wapner, Wohlwill) were based, were instrumental in effecting collaboration and early cross-disciplinary swapping of ideas (see Canter & Craik, 1987).

However, during the 1970s, the cross-fertilization of ideas across disciplinary boundaries became less common. Psychologists became more concerned with establishing environmental psychology as a vital subdiscipline in its own right, leading to the establishment of the *Journal of Environmental Psychology* in 1981. Meanwhile, behavioral geography started to dissipate through internal conflict, as it manifested itself in two very different forms. On one hand, there were those who were concerned with incorporating behavioral variables in spatial models, and on the other, those who rejected spatial analysis outright and were concerned with "sense of place," values, morals, and phenomenological inquiry. Accompanying these internal divisions were philosophical attacks from structuralists and humanists, who claimed that behavioral research was mechanistic and dehumanizing and ignored the broader social and cultural context in which decision making operated (Gold, 1992). Much of this rhetoric, however, derived from a simple confusion of *behaviorist* and *behavioral* approaches, thus attributing to behavioral geographers all the "perceived evils" of behaviorist science and experimentation. This confusion still emerges in some geographic literature today. Despite these attacks, behavioral geography has survived, with some researchers arguing that it now seems set for a rejuvenation within mainstream geographical research (Aitken, 1991; Walmsley & Lewis, 1993). As a result, there has been a growing call for psy-

chology and geography to once again form cross-disciplinary links and to integrate ideas, concepts, and theories (Gärling & Golledge, 1993b; Kitchin 1993). There are a number of areas of interest that psychologists and geographers share, and it is suggested that collaborative research should form around five basic themes: spatial thought, spatial behavior, understanding maps and geographic material, spatial decision making and choice, and hazard cognition.

EXPLORING THE LINKS BETWEEN PSYCHOLOGY AND GEOGRAPHY

Spatial thought refers to how we think about geographic space and the surrounding everyday environment (Liben, 1981). Both geographers and psychologists have been investigating how we learn and acquire geographic knowledge, how this knowledge is structured within the mind, in what form (e.g., images or propositions), and how it is accessed and used for guiding behavior. Kitchin (1996) reports that a number of theories now exist concerning these factors. For example, there have been several theories concerning cognitive map development, proposed by both psychologists and geographers—for example, Piaget and Inhelder (1956), Werner (1957), Hart and Moore (1973), Siegel and White (1975), and Golledge (1978). In addition, theories exist concerning learning strategies (e.g., landmark-based, Golledge, 1978; or route-based, Allen, 1981); constituent components (Golledge, 1993); knowledge structures (Liben, 1981; Thorndyke, 1981); the structure of cognitive map knowledge (e.g., networks, Kaplan, 1973; or partially hierarchical, Stevens & Coupe, 1978); and the form of cognitive map knowledge (e.g., images, Kosslyn & Pomerantz, 1977; propositions, Anderson & Bower, 1973; dual coding, Paivio, 1979; or genetic coding, Fishbein, 1976). These theories focus on very specific features of a larger whole and tend to exist as separate subareas of study and have not, as yet, been interwoven to create an integrative framework that provides an adequate account of spatial thought as a whole. Clearly geog-

raphers and psychologists can learn from one another, and the linking of geographical and psychological ideas and theories will go some way toward creating such an integrative framework. To some extent, this is already the case as geographers have used and extended psychological theories. For example, Matthews (1984) applied cognitive map theories to children's environmental knowledge and, in so doing, considered not only age-related differences but also gender differences. Researchers from both backgrounds have contributed new methodologies to the field (see Foreman & Gillett, in press), but there is still the potential for greater interaction between the two areas of research. A better understanding of spatial thought is important because it provides us with information that is the cornerstone of spatial behavior and decision making.

Geographers (Golledge, 1992), planners (Carpman, Grant, & Simmons, 1985; Passini, 1992), and psychologists (Butler, Acquino, Hissong, & Scott, 1993; Gärling, Book, & Lindberg, 1986) have sought to understand human spatial behavior, particularly wayfinding and navigation skills in small- and large-scale spaces. Although geographers and planners tend to examine the features in the built and natural environment that aid our navigation and orientation (e.g. Lynch, 1960) and the ways we use such features, and psychologists generally seek to understand the decision-making process involved in navigating (e.g., Magliano, Cohen, Allen, & Rodrigue, 1995), there are large overlaps of common ground. For example, in recent years, researchers from both fields have begun to understand how people with disabilities find their way around the world; the spatial abilities and behaviors of people with vision deficits have been studied by researchers such as Passini and Proulx (1988), Klatzky et al. (1990), Loomis et al. (1993), and Rieser, Lockman, and Pick (1980). Spatial abilities and behaviors of people who are mentally retarded have been examined by Golledge, Richardson, Rayner, and Parnicky (1983). Similarly, the behavior of people who use wheelchairs has been examined by Matthews and Vujakovic (1995). Information concerning spatial behavior is useful to planners, who can use it to design environments that facilitate greater and easier use. For example,

Carpman et al. (1985) explored the effects of hospital design on wayfinding and found that poor design caused increased environmental stress to staff, patients, and visitors. Carpman et al. were able to suggest design changes to facilitate wayfinding in the building.

Both geographers and psychologists are interested in how people understand maps and geographic material; the aim of such research is to find ways to improve people's skills in interpreting such information (e.g., Gerber & Kwan, 1994) and also to improve the maps and material so that they are easier to understand (Lloyd & Steinke, 1986). Psychologists Thorndyke and Statz (1980) and geographers Gilmartin and Patton (1984) have both investigated ways to improve map reading and interpretation skills, and psychologist Thorndyke (1981) and geographer MacEachren (1991) have examined how to redesign maps to increase their usability. Similar multidisciplinary arguments have been advanced for improving the output from geographic information systems (Mark & Gould, 1991; Medyckyj-Scott & Blades, 1992). These issues have particular relevance to geographic education for children (e.g., Matthews, 1992). Such research might also produce technical aids, such as tactile maps and talking signs, for people with visual impairments or blindness, improving the quality of life of people with disabilities by increasing their independence (see Golledge, Loomis, Klatzky, Flury, & Yang, 1991; Ungar, Blades, & Spencer, 1995).

Geographers and psychologists are interested in the everyday spatial decisions we make that guide our behavior (e.g., Gärling, 1995). These decisions affect our choices of where to shop, our leisure and recreation destinations, our commuting patterns, our migration patterns and residential and housing choices, and our choice of transport modes and the routes followed in pursuit of different activities (Axhausen & Gärling, 1992). For example, Coshall (1985a, 1985b) examined the spatial decision making of consumers when faced with competing shopping areas, and Pacione (1978, 1982) and Halperin, Gale, Golledge, and Hubert (1983) examined choices of residential or business location. These activities are part of our

everyday actions, and an understanding of how we arrive at such decisions is vital for forecasting future behavior changes for policy makers and planners. Both psychologists (e.g., Montgomery, 1993) and geographers (e.g., Clark, 1993) have conceptualized the residential site selection process, and in doing so, they have paved the way for the development of matching models of residential site selection and the modeling of home buyer search activities. In a somewhat similar vein, geographers, psychologists, planners, and transportation specialists have become involved in consumer preference studies (e.g., Louviere, 1988; MacKay & Zinnes, 1988; Timmermans, 1980, 1981, 1986), in the design and implementation of traffic diary data and travel behavior (Goulias, Pendyala, & Kitamura, 1990; Koppelman & Pas, 1984; Robinson, Kitamura, Pas, & Golob, 1993), and in the selection of route choice criteria (Gärling & Hirtle, 1990; Golledge, 1995).

Much of the early impetus of behavioral geography came from researchers interested in hazard cognition. Investigators such as White (1945) and Kates (1962) asked questions relating to why people moved into, and continued to live in, areas that were susceptible to natural and technological hazards. For example, Kates was interested in why people continued to live in areas along the eastern seaboard of the United States, areas prone to hurricanes and consequent tidal damage and flooding. Some of this research has been directed by the goals of understanding the differences among individuals, cultures, and societies in recognizing hazards and how societies might best respond to them (Kasperson & Dow, 1993). Psychologists have been tackling the same questions, with an emphasis on "assessing the complex and subtle opinions that people have about risk" and determining what factors underlie those perceptions (Slovic, 1993, p. 224). Slovic explained that most studies focused on the assessment process and decision-making procedure, although this has broadened to mental strategies and heuristics (see O'Riordan, 1995). Clearly, both geographers and psychologists are interested in people's behavior in hazardous areas and the decision-making and thought processes that underlie such behaviors.

TOWARD INTEGRATION AND COLLABORATION

It is clear from the preceding discussion that environmental psychology and behavioral geography share a number of interests and characteristics. In both subdisciplines, people are seen as an integral part of every problem and the environment is defined and ordered through human actions (Gold, 1980). Furthermore, researchers use similar techniques to collect and analyze their data. The most notable differences between the two concern the scale of analysis and their relationship to their parent disciplines. Psychologists tend to be more interested in the processes of cognition and are therefore predisposed to more manageable, small-scale spaces and environments. Geographers, however, are more interested in people's behavior in the macroenvironment, so that rather than asking the "how" questions often asked by psychologists, they are more interested in "what, where and why" questions and the reasons for the resultant location or behavior patterns, especially in real world situations. Lately, geographers have become more interested in how questions and have started to tackle them, explicitly integrating psychological theory into their studies (e.g. Golledge, Smith, Pellegrino, Doherty, & Marshall, 1985; Lloyd, 1989). A glance at the bibliographies of articles by psychologists reveals that, by and large, they have remained fairly impervious to the geographic literature published outside of psychology journals. Although there are some examples of collaborative research that are exceptions to this generalization (e.g., Downs & Liben, 1991; Gärling & Golledge, 1989, 1993b), there is an imbalance in the exchange of ideas. This is not surprising, given the different relationships between behavioral geography and environmental psychology and their parent disciplines and the loss of links in the formative 1970s. Behavioral geography represented a challenge to mainstream geographical thought by offering an alternative to the "peopleless" geographies of spatial science and the excesses of the quantitative revolution. Environmental psychology, however, was a self-conscious attempt to apply psychology to new contexts and as such sought

to study behavioral processes in real world settings (Gold, 1980).

Geographers can offer psychologists unique insights into the natural and built environment, analyzing behavior patterns and providing complex spatial and cartographic analyses of spatial products (see Buttenfield, 1986; Kitchin, 1993; Tobler, 1976; Waterman & Gordon, 1984). Lunt (1994) has argued that psychologists could also learn much from the recent transformations within geography, both in terms of theoretical positions and methodological advances. He explained that geography has been rethinking the role of everyday life and personal identity, moving toward social theory and cultural studies and away from positivism. Certainly, behavioral geography is moving out of the constrictures of cognition to become reactive to the wider social, cultural, and economic context in which behavior occurs.

Walmsley and Lewis (1993) postulate that behavioral approaches can successfully play a complementary role alongside historical materialist interpretations of social phenomena. For example, Lagopolous and Boklund-Lagopoulou (1992) explored the sociospatial construction of Macedonia by trying to integrate concepts from semiotics, historical materialism, and behavioral geography in an effort to provide an account that acknowledges the roles played by social and historical dynamics.

Recently, there have been renewed calls for collaboration to strengthen theory building and advance research through a wider understanding of current developments (e.g., Gärling & Evans, 1991; Gärling & Golledge, 1993b; Kitchin, 1993; Lunt, 1994). Evans and Gärling (1991) suggest that this might help identify new ideas, theories, models, hypotheses, and methods of data collection and analysis, revealing points of convergence and divergence between disciplines. For collaborative research to develop, an integrative framework that can unite the ideas and theories from both psychology and geography needs to be formulated, and the problems associated with such a merger must be noted.

The need for such collaboration and communication can be illustrated by reference to research into cognitive maps. Researchers such as Lloyd (1982), Allen (1985), and Golledge et al. (1985) argue that cognitive mapping theories at present only represent general positions rather than formal models. In addition, they suggest that many studies have been motivated by hypotheses that are too limited to be of general applicability or too general to have been meaningful hypotheses in the first place. Theories, then, suffer from being too specific to relate to cognitive mapping as a whole, or too vague to give rise to testable hypotheses. If environment-behavior research is to advance and gain acceptance from a wider audience, the multidisciplinary base must unite and adopt an integrative approach to study (Gärling et al., 1991).

Gärling et al. (1991) offer a cautionary note, stating that a suitable integrative framework has to be established first before any integration of ideas and theories can begin. In other words, the process of collaboration must be carefully worked out before collaborative work, or noncollaborative work that borrows ideas, is undertaken, to stop the misuse and abuse of theory and methodology. Hart and Conn (1991) contend that researchers fear developing such an integrative framework because it cannot be discovered easily using the traditional tenets of good theory building through experimental research design. Russ and Schenkman (1980) argue, however, that such integrations form the basis of scientific progress. Scientific advancement is dependent on quick, untested exchanges, ideas, and hypotheses, which can later be formalized and tested. Environment and behavior research has developed, and such hypotheses have been tested, and we suggest that research now needs to be extensively formalized.

Both Wapner (1987) and Kitchin (1996) have begun exploring these problems of developing an integrative theoretical conceptual schema of environment-behavior interaction with an associated research strategy. Kitchin has developed a schema (Figure 1) that draws together five contemporary theories about

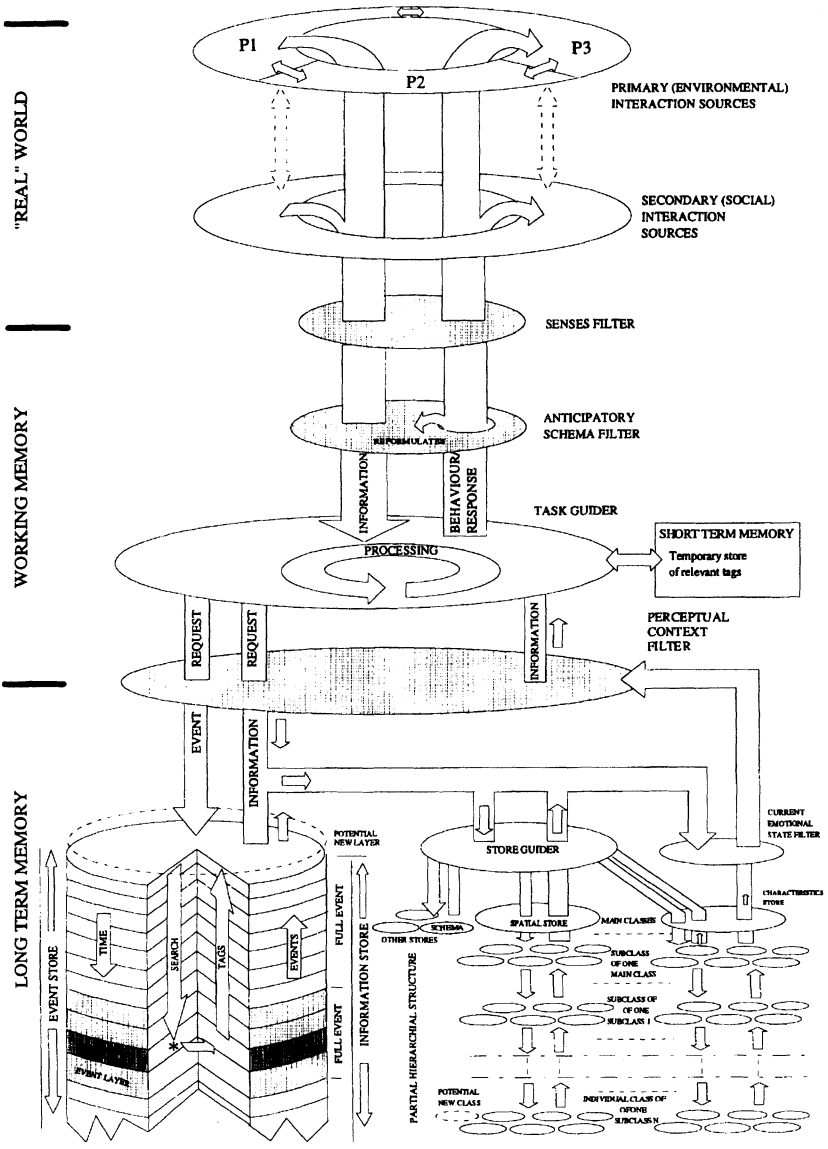

Figure 1: A Schema of Spatial Thought and Behavior

SOURCE: Kitchin (1996). Reprinted with permission.

the knowledge content of cognitive maps, their structure and form, the learning strategies used to acquire such knowledge, and the processes of spatial thought that interweaves them with basic transactional theory to produce a more detailed schema of spatial thought and behavior. The schema is based on an extensive review of the literature from both geography and psychology, weaving together and integrating elements reported by both disciplines.

This schema suggests that environmental behavior is mediated through a complex set of processes linking mental processes with real world contexts.[1] The schema is divided into three embedded sections that are intricately linked and entwined. As such, there are no start and end points, but rather sections work in parallel. The first section is the real world and consists of environmental and social interaction. The second section is the working memory and illustrates the processes of thought. The third section is the long-term memory and illustrates how we store and access our knowledge. The entire schema works on the assumption that memory consists of a system of pointers linking a set of partially hierarchial network stores.

Kitchin argues that by combining contemporary theories into a more complete whole, this schema advances transactionalism by explicitly detailing the mental processes that are used in environment-behavior interaction. As such, it can provide a theory that is framed in cognition and human agency and that is reactive to environmental, societal, and cultural contexts. In this manner, it provides a new theoretical framework for future environment-behavior interaction research, raising new questions and providing testable hypotheses.

This article is intended as a formative attempt to remove some of the remaining barriers between geography and psychology by detailing some of the research areas that geographers and psychologists share and by exploring some of the issues that can contribute to the integration of ideas and theories from both fields. We are hopeful that our arguments will lead to more cross-disciplinary research and collaborations between researchers in the different disciplines.

NOTE

1. For a full explanation of how this schema works and the relationships between each of the components, see Kitchin (1996).

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