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Environmental Psychology

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WHY PSYCHOLOGY NEEDS ENVIRONMENTAL PSYCHOLOGY

Introduction

This review, like the model of psychology we advocate, looks to the past, present and future of environmental psychology. The chapter begins with a discussion of the importance of the socio-environmental context for human behaviour. Having demonstrated that the environment, far from being a silent witness to human actions, is an integral part of the plot, the chapter continues with an examination of the nature and scope of environmental psychology. Its interdisciplinary origins and applied emphasis have both conspired to prevent a straightforward and uncontentious definition of environmental psychology. We review some of these and suggest how recent definitions are beginning to adopt a more inclusive, holistic and transactional perspective on people-environment relations. The next section discusses the various spatial scales at which environmental psychologists operate - from the micro level such as personal space and individual rooms, public/private spaces and public spaces through to the global environment. This incorporates research on the home, the workplace, the visual impact of buildings, the negative effects of cities, the restorative role of nature, and environmental attitudes and sustainable behaviour. The third section takes three key theoretical perspectives which have informed environmental psychology - determinism, interactionism, and transactionalism. - and uses these as an organising framework to examine various theories used by environmental psychologists: arousal theory, environmental load, adaptation level theory within a behaviourist and determinist paradigm; control, stress adaptation, behavioural elasticity, cognitive mapping and environmental evaluation within an interactionist paradigm; and behaviour settings, affordance theory and theories of place, place identity and place attachment within transactionalism.

The fourth section looks to the future of environmental psychology by challenging the assumptions and limiting perspectives of present research. The issues at the forefront of the political and environmental agenda at the beginning of the 21st century - human rights, well-being and quality of life, globalisation and sustainability - need to be addressed and tackled by environmental psychologists in a way that incorporates both cross-cultural and temporal dimensions. The impact of environmental psychology may be enhanced if researchers worked within the larger cultural and temporal context which condition people's perceptions and behaviour within any given environment. This concluding section discusses some of the work being undertaken by environmental psychologists which seeks to meet this challenge and address what some have considered as an 'application gap' within environmental psychology (i.e., the gap between the generation of general principles and 'on the ground' advice of direct use to practitioners).

The Environment as Context

One of the shortcomings of so much psychological research is that it treats the environment simply as a value-free backdrop to human activity and a stage upon which we act out our lives. In essence, the environment is regarded as noise. It is seen as expedient in psychological investigations and experiments to remove or reduce as much extraneous noise as possible that will affect the 'purity' of our results. This is understandable and desirable in many situations, but when it comes to understanding human perceptions, attitudes, and behaviours in real-world settings then the environment is a critical factor that needs to be taken into account.

A paper was presented at an environmental psychology conference recently which reported on an investigation of children's classroom design preferences. The study was undertaken

by means of showing the children photographs of different classroom layouts. There were three principal methodological flaws which illustrate well the issue of the role and importance of environmental context in psychology. Firstly, the photographs included neither adults nor children. In other words, the photographs did not illustrate or indicate how the environment was actually being *used* by either children or adults. When the researcher was asked why children and adults were excluded from the photographs, the response was that they would have been a distraction. This is another variant of the failing identified in the above paragraph. In this case, people are treated as noise and become environmental 'objects'. It is assumed that if we can get people to preferentially rate environments without those environments being 'contaminated' with people, then we will arrive at a more 'pure' measure of the impact of the environment on human preferences.

The second flaw with this study was that all the photographs were taken at adult height, thereby providing an adult perspective on the environment even though it was children's perceptions and preferences that were being sought. Finally, all the photographs were taken from an adult point of view (e.g., the framing, focus, what was included and excluded) as if the environment is visually and symbolically neutral. In other words, the researcher thought that taking photographs of the classrooms could provide an objective and impartial view of the environment. If the photographs had been taken by the children from their own perspective, the photographs might have come to mean very different things to the children and brought about a very different evaluation. The environment provides us with opportunities and constraints - sets of affordances - which we can choose to draw upon (Gibson, 1979). Of course, not all children will perceive the same affordances in a single environment, and neither will similar environments generate the same perceptions and evaluations in a single child (Wohlwill and Heft, 1987).

It is a characteristic feature of environmental psychology that in any environmental transaction attention should focus on the user of the environment as much as the environment itself. For example, as it is not possible to understand the architecture and spatial layout of a church, mosque or synagogue without reference to the liturgical precepts which influenced their design, so it is no less possible to understand any landscape without reference to the different social, economic and political systems and ideologies which inform them.

One might well imagine, for example, a school landscape that looks extremely tidy, well kempt, with clear demarcation of spaces, producing a controlled and undifferentiated environment with easy surveillance, and with learning and other activities taking place in pre-determined spaces. Such a designed environment reflects a traditional view of the passive, 'empty' learner waiting for educational input. If one now imagines a school landscape which appears on the surface to be more haphazard and not so well ordered, unkempt with long grass, soft or even no edges between activities, less easy surveillance and no obvious places for learning specific curriculum subjects, then this would seem to be antithetic to learning and education. However, if one switches to another model of the child: the child as a stimulus-seeking learner, then the sterile, formal, and rigid landscape described above would seem like an inappropriate place for learning. On the other hand, providing an unstructured, environmentally diverse set of landscapes would seem to be an ideal place for learning, encouraging children to seek out the stimulation they need for learning and development. Reading the environment in terms of the assumptions it makes about the user is instructive. Understanding and designing the environment for human activity can only be achieved when both the environment and the user are considered together as one transaction.

The environmental setting is not a neutral and value free space; it is culture-bound. It is constantly conveying meanings and messages and is an essential part of human functioning and an integral part of human action. As Getzels writes, 'Our vision of human nature finds expression in the buildings we construct, and these constructions in turn do their silent yet irresistible work of telling us who we are and what we must do' (Getzels, 1975, p.12). The environment embodies the social and cultural values of those who inhabit it. Some psychologists argue that we need only focus on people because although the environment contains the manifest evidence of the values and meanings held by people, these values and meanings can be investigated 'at source', i.e., in the people themselves. As we know that attitudes are not always good predictors of behaviour, so we might also assume that what people say about the environment and their actions within it may actually be contradicted by extant evidence from the environment itself. Furthermore, the environment is not just a figment of our imagination or a social construct, it is real. If we take a deterministic or even an interactionist position we would acknowledge that the environment can have a direct effect on human actions. Within transactionalism the environment has a physical manifestation in order to confer meaning in the first place. The environment embodies the psychologies of those who live in it. It is used to confer meaning, to promote identity, to locate the person socially, culturally and economically.

The role of environmental context in influencing social behaviour can be exemplified by reference to interpersonal relations as well as institution-person relations. Helping behaviour is a good example of the influence of environmental context on the interpersonal behaviour. The conclusions of numerous research studies undertaken since the 70's (Korte, 1980; Korte and Kerr 1975; Krupat, 1985, Merrens, 1973) consistently demonstrate that the conditions of urban life reduce the attention given to others and diminish our willingness to help others. Aggressive reactions to a phone box out of order are more common in large cities than in small towns (Moser, 1984). Those findings have been explained by the levels of population densities such as we encounter in large urban areas which engender individualism and an indifference towards others, a malaise noted by Simmel in 1903 who suggested that city life is characterised by social withdrawal, egoistic behaviours, detachment, and disinterest towards others. The reduction of attention to others can also be observed when the individual is exposed to more isolated supplementary stressful condition (Moser, 1992). Thus, excessive population density or the noise a pneumatic drill significantly reduces the frequency of different helping behaviours (Moser, 1988). If, generally speaking, politeness (as measured by holding the door for someone at the entry of a large department store) is less frequent in Paris than in a small provincial town, then this would suggest that population density and its immediate impact on the throughput of shoppers will affect helping and politeness behaviour (Moser and Corroyer, 2001).

A good example of the effect of environmental context on human attitudes and behaviour in an institution-person setting can be found in Rosengren and deVault's (1974) study of the ecology of time and space in an obstetrical hospital. They found that both the attitudes and behaviour of all the protagonists involved in the process of delivering a baby – the mother, nurses, doctors – were not only a function of where they were situated, but also when they were situated there. Authority (i.e., who managed the mother's labour and delivery) was not so much a function of a formal position in the hierarchy but where each person was at a particular time and who controlled that space. This time/space interaction not only impacted upon staff-patient relations but also on perceptions of the appropriateness of medical procedures as they related to the management of pain.

The environmental context in which perceptions occur, attitudes are formed and behaviour takes place also has a temporal dimension. We cannot understand space and place without taking into account time. When we encounter an environment we not only encounter it in the

present, but also in the past and the future. We experience places not only now, in the present, but places which have had a past which impinges upon and colours our interpretation of the present. Furthermore, these same places have a future which, for example, through anticipatory representations may guide our actions (Doise, 1976).

The Nature and Scope Environmental Psychology

Environmental psychology studies individuals and groups in their physical and social context, by giving a prominent place to environmental perceptions, attitudes, evaluations, and representations and accompanying behaviour. Environmental psychology focuses on both the effects of environmental conditions on behaviour and how the individual perceives and acts on the environment. The point of departure of analysis is often the physical characteristics of the environment (e.g., noise, pollution, planning, and layout of physical space) acting directly on the individual or mediated by social variables in the environment (e.g., crowding, population heterogeneity). But physical and social factors are inextricably linked in their effects on individuals' perceptions and behaviour (Altman and Rogoff, 1987). In order to achieve this effectively, environmental psychology research aims to identifying processes which regulate and mediate this relationship. Environmental psychologists work in collaboration with other psychologists such as social, cognitive, and occupational psychologists, as well as other disciplines and professions such as architects, educationalists, environmental scientists, engineers, landscape architects and planners.

Environmental psychology's unit of analysis is the individual-environment relation. One can only study this relation by examining cognitions and behaviour which occur in real-world situations. For this reason, environmental psychology operates according to an *inductive logic*: theories are generated from what can be observed and from data unearthed in research in the real world. Kurt Lewin's advocacy of theory-driven practical research ought to have a resonance with environmental psychologists.

The conceptual model by which our perceptions, representations, and behaviour are interdependent with the physical and social environment has frequently been mentioned in psychology. Brunswik (1959) and Gibson (1950) in their work on perception, referred to the role of the environment; Tolman (1948) used the concept of the "mental map" to describe the cognitive mechanisms which accompany maze-learning; and Lewin (1951) in the domain of psychology of form elaborated the theory of the environmental field, conceived as a series of forces which operate on the individual. Lynch's study of *The Image of the City* (1960), although by an urban planner, was another major landmark in the early years of environment-behaviour research. The first milestones of environmental psychology date from the late 1960s (Barker, 1968; Lee, 1968; Proshansky, Ittelson and Rivlin, 1970; Craik, 1970). The intellectual and international origins of environmental psychology are considerably broader than many, typically North American, textbooks suggest (Bonnes and Secchiaroli, 1995).

Although environmental psychology can justly claim to be a sub-discipline in its own right, it clearly has an affinity with other branches of psychology, especially social psychology, but also cognitive, organisational, and developmental psychology. Examples of where environmental psychology has been informed by and contributed to social psychology are inter-group relations, group functioning, performance, identity, conflict and bystander behaviour. However, social psychology often minimises the role of the environment as a physical and social setting, and treats it as simply the stage on which individuals and groups act rather than as an integral part of the plot. Environmental psychology adds an important dimension to social psychology by making sense of differences in behaviour and perception

according to contextual variables – differences which can only be explained by reference to environmental contingencies.

Although there are strong links to other areas of psychology, environmental psychology is unique amongst the psychological sciences in terms of the relationship it has forged with the social (e.g., sociology, human ecology, demography), environmental (e.g., environmental sciences, geography) and design (e.g., architecture, planning, landscape architecture, interior design) disciplines.

Because of the difficulties of defining environmental psychology, many writers have sought instead to 'characterise' or describe it, as we have done in part ourselves above. The most recent of these can be found in the fifth edition of Bell, Greene *et al*'s (2001) textbook *Environmental Psychology*. They suggest that a) environmental psychology studies environment-behaviour relationships as a unit, rather than separating them into distinct and self-contained elements, b) environment-behaviour relationships are really interrelationships, c) there is unlikely to be a sharp distinction between applied and basic research, d) it is part of an international and inter-disciplinary field of study, and e) it employs an eclectic range of methodologies. But description is not a substitute for definition. Leaving aside Proshansky *et al*'s oft-quoted 'environmental psychology is what environmental psychologists do' (1970, p5), the same authors suggested in 1970 that '.....in the long run, the only really satisfactory way - is in terms of theory. And the simple fact is that as yet there is no adequate theory, or even the beginnings of a theory, of environmental psychology on which such a definition might be based.' (1970, p5). By 1978, Bell, Fisher, and Loomis, in the first edition of the aforementioned textbook *Environmental Psychology*, cautiously suggested that it is 'the study of the interrelationship between behaviour and the built and natural environment', although they preferred to opt for the initial Proshansky *et al* conclusion. Other, not dissimilar, definitions followed: '... an area of psychology whose focus of investigation is the interrelationship between the physical environment and human behaviour and experience' (Holahan, 1982, p3); '..... is concerned with the interactions and relationships between people and their environment' (Proshansky, 1990); '...the discipline that is concerned with the interactions and relationships between people and their environments' (McAndrew, 1993, p2).

The problem with some of these definitions is that while they describe 'what environmental psychologists do', they also hint unfortunately at what other disciplines do as well. For example, many (human) geographers could probably live quite comfortably with these definitions. By 1995, Veitch and Arkkelin were no less specific and perhaps even enigmatic with the introduction of the word 'enhancing': 'a behavioural science that investigates, with an eye towards enhancing, the interrelationships between the physical environment and human behaviour.'

These are clearly not the only definitions of environmental psychology, but they are reasonably representative. There are various noteworthy features about these definitions. First, because the area is necessarily inter-disciplinary, the core theoretical perspectives which should inform our approaches have sometimes been minimised. Thus Bonnes and Secchiaroli (1995) draw attention to the need to define the field as a function of the psychological processes studied. Most definitions of environmental psychology focus on the relationship between the environment and behaviour, yet paradoxically most of the research in environmental psychology has not been about behaviour but perceptions of and attitudes towards the environment and attitudes towards behaviour in the environment. Second, many of the definitions refer to relationships between people and the physical or built environment. Proshansky acknowledged that this was problematic because this fails to recognise the importance of the social environment. The distinction between built and

natural environments is becoming increasingly untenable given the mutual dependency and reciprocity which exists between them, especially within the context of the sustainability debate. Finally, many of the definitions talk about the individual interacting with the environment. Unfortunately, this ignores or minimises the social dimension of environmental experience and behaviour. This is a strange omission given the strong influence of social psychology on the area, although perhaps a reflection of the individualistic nature of much social psychology.

Gifford more usefully offered the following: 'Environmental psychology is the study of transactions between individuals and their physical settings. In these transactions, individuals change the environment and their behaviour and experiences are changed by the environment. Environmental psychology includes research and practice aimed at making buildings more humane and improving our relationship with the natural environment.' (Gifford, 1997, p1). This is a far more inclusive definition and captures key concepts such as experience, change, people-environment interactions and transactions and natural/built environments. As long ago as 1987, Stokols suggested that 'the translation of a transactional world view into operational strategies for theory development and researchposes an ambitious but promising agenda for future work in environmental psychology.' (Stokols, 1987, p41). The essence of a transactional approach is 'its emphasis on the dynamic interplay between people and their everyday environmental settings, or "contexts"' (*ibid*, p42)

DOMAINS OF ENVIRONMENTAL PSYCHOLOGY

Environmental psychology deals with the relationship between the individual and his/her life-space. That includes not only the environment to provide us with all what we need to survive, but also the spaces in which to appreciate, understand and act to fulfil higher needs and aspirations.

The individual's cognitions and behaviour gain meaning in relation to the environment in which these cognitions or behaviours are developed. Consequently, environmental psychologists are confronted with the same issues as those with which all psychologists are concerned. The basic domains of environmental psychology include: (1) environmental perceptions and cognitions, (2) environmental values, attitudes and assessment, and (3) behavioural issues. It studies these processes in relation to the environmental setting and situation in which they occur. For instance, environmental perceptions are not typically studied with the aim of identifying general laws concerning different aspects of the perceived object. Environmental perception deals with built or natural landscape perception with an emphasis on sites treated as entities (Ittelson, 1973); the perceiver is considered as part of the scene and projects onto it his/her aspirations and goals which will have an aesthetic dimension as well as a utilitarian function. The question the perceiver asks in appraising a landscape is not just 'do I like the appearance of this landscape?', but also 'what can this landscape do for me (i.e., what function does it serve)?' (Lee, 2001). Likewise, interpersonal behaviour within an environmental psychology context is studied in order that we might better understand how environmental settings influence these relationships (e.g., urban constraints on frequency of relational behaviour with friends or relatives, Moser, 1992).

Environmental psychology, because of its very focus, has been and remains above all a *psychology of space*, to the extent that it analyses individuals' and communities' perceptions, attitudes and behaviours in explicit relation to the physical and social contexts within which people and communities exist. Notions of space and place occupy a central position. The discipline operates, then, at several levels of spatial reference enabling the investigation of people-environment interactions (at the individual, group or societal level) at each level.

Reference to the spatial dimension makes it possible to take into account different levels of analysis:

Level I: Private Spaces (*individual level*): personal and private space, dwelling, housing, workplace, office,

Level II: Public/Private Environments (*neighbourhood-community level*): semi-public spaces, blocks of flats, the neighbourhood, parks, green spaces;

Level III: Public Environments (*individual / community level, inhabitants*) : involving both built spaces (villages, towns, cities) as well as the natural environment (the countryside, landscape, etc.), and

Level IV: The Global Environment (*societal level*) : the environment in its totality, both the built and the natural environment, natural resources.

Environmental psychology analyses and characterises *people-environment interactions and/or transactions* at these different environmental levels. These relations can best be understood through perception, needs, opportunities, and means of control.

Private Spaces

Personal space and privacy are important for individual and community well being and quality of life. Altman (1975) defines privacy as the 'selective control of access to the self or one's group'(p18). Thus privacy implicates control over the immediate environment. It is important for the individual to be able to organise and personalise space. Privacy represents a dynamic process of openness/closeness to others (Altman & Chemers, 1980). Thus, privacy adjustments may be established with physical or even psychological barriers wherever the individual seeks to isolate himself or to protect himself of the intrusion of others. This may be important in one's home, but also in the work environment or during leisure activities (e.g., on the beach). Privacy involves not only visual, but also auditory exclusivity (Sundstrom *et al.* 1994). Steady or transitionally occupied places produce place attachment and are often accompanied with ties to personal objects like furniture, pictures and souvenirs which mark the appropriation (Korosec-Serfaty, 1976). Appropriation can be defined as a particular affective relation to an object. The appropriated object may become part of the identity of the individual (Barbey, 1976). The appropriation of space has essentially a social function in the sense that the individual or the group mark their control over the space (Proshansky, 1976) which in turn produces a feeling of security. When appropriation is not shared with others, or only with one's group, control is absolute.

The use of space in the home or the office environment has produced a variety of studies. The intended function of a room (e.g., kitchen, dormitory, etc.) implies a specific design and determines how the space will be used. There are considerable individual and cultural differences in the use of space in one's home (Rapoport, 1969; Kent, 1991; Newell, 1998).

Personal space is defined as the invisible boundary surrounding each individual into which others may not intrude without causing discomfort (Hall, 1966). Personal space regulates interactions, and its extension depends on environmental variables. Its functions are twofold: protection – it acts as a buffer against various interpersonal threats; communication purpose – it determines which sensory communication-channel (touch, visual or verbal) can and should be used. Thus interpersonal distances are cues for understanding the specific relationship of two individuals. Research has looked at various social determinants of personal space such as culture and ethnicity, age and gender (e.g., Aiello, 1987; Crawford and Unger, 2000), psychological (Srivastava and Mandal (1990) and physical (Altman and Vinsel, 1977; Jain, 1993, Evans, et al, 1998).

Territoriality is, in contrast to personal space, visibly delimited by boundaries and tends to be home or workplace-centred. It is a demarcated and defended space and invariably is an expression of identity and attachment to a place (Sommer, 1969). Territories are controlled spaces which serve to enable the personalization and regularisation of intrusion. Therefore, territoriality has an essential function in providing and promoting security, predictability, order, and stability in one's life. Altman and Chemers (1980) identified three types or levels of territory – primary territories (e.g., home or office space) in which control is permanent and high, and personalization is manifest; secondary territories (e.g., the classroom or open plan office) where control, ownership and personalization is temporary, and public territories (e.g., the street, the mall) where there is competition for use, intrusion is difficult to control and personalization is largely absent.

Public/Private Environments

The Home Environment: Analyses at Level II deal with the immediate environment of the individual's living space. These could be rows of houses or apartment blocks, the immediate neighbourhood, the workplace, the leisure areas in the immediate surroundings of the home like parks and green areas. These areas are referred to as *semi-public* or *semi private* spaces, which mean that the control over them is shared within a community.

A great deal of research in environmental psychology concerns the immediate home environment. Concepts like 'attachment to place' and 'sense of community' contribute to our understanding of how individuals and groups create bonds to a specific place. Although the 'size' of the habitable space is essential for residential satisfaction, other aspects of the living conditions also modulate its importance. Residents enhance the value of their neighbourhood through the transactional relationships they establish with their place of residence. For those who have already acquired 'basic' living conditions and who have an income that allows them to achieve a good quality of life, the agreeable character of the neighbourhood has a modulating effect on satisfaction concerning available space in the dwelling. The affective relationship with the dwelling and anchorage in childhood seem to play an important role. Giuliani (1991) found that affective feelings towards the home were attributable to changing conceptions of the self in relation to the home over the life-span.

The feeling of being 'at home' is closely connected to a feeling of well-being, and varies with the extent of the spatial representation of the neighbourhood. A spatially narrow representation is correlated with a weak affective investment in the neighbourhood (Fleury-Bahi, 1997; 1998). The degree of satisfaction felt with three of a neighbourhood's environmental attributes (green spaces, aesthetics of the built framework and degree of noise) has an effect on the intensity of the affectivity developed towards it, as well as feelings of well-being. The feeling of being at home in one's neighbourhood is linked to the frequency of encounters, the extent of the sphere of close relations, the nature of local relationships and satisfaction with them. Low and Altman (1992) argue the origin and development of place attachment is varied and complex, being influenced by biological, environmental, psychological, and socio-cultural processes. Furthermore, the social relations that a place signifies may be more important to feelings of attachment than the place itself.

Beside the home and neighbourhood environments, other domains involve a problematic congruence between people and their environment, for example, work, classroom, and institutional environments (hospitals, prisons, homes for children or the elderly). How can these environments be designed to meet the needs of their occupants? We will illustrate this by examining one setting - the workplace.

Environmental Psychology in the Workplace: Increasing attention is being paid to the design of the workplace so that it matches more effectively the organisation's goals and cultural aspirations as well as employee needs and job demands and performance. There has been a long history of research into the workplace (Becker, 1981; Wineman, 1986; Sundstrom, 1987; Becker and Steele, 1995). Indeed, the famous 'Hawthorne effect' first noted in the 1920's emerged from a study of the effect of illumination on productivity. Since then there have been many studies examining the ambient work environment investigating the impact of sound, light, furniture layout, and design on performance and job satisfaction. It is now recognised that the environment, space, and design can operate at a more subtle level and can be used for as well as impact upon issues such as status, reward and the promotion of corporate culture.

Decisions about space use and design should be examined for their embedded assumptions as to how they will enhance or detract from the organisation's goals and values. In other words, whose assumptions underlie the design and management of space and what are the implications of space planning decisions? The relationship between the organisation's cultures, the physical planning of the building/offices and the 'feel', look and use of the facilities becomes most apparent especially when there is a mismatch. A mismatch often occurs when a new building is planned according to criteria such as: how many people should it accommodate? How many square feet should it occupy? How much equipment should it have? How should it look to visitors? Questions typically posed and addressed by environmental psychologists have a different emphasis: will the designs and space layout enhance or detract from the desired corporate work styles? Is the organisation prepared to accept that employees have different working styles and that these should be catered for in the provision of space and facilities? How much control does the organisation currently exert over its employees' time and space use? To what extent is the employee permitted to modify their own environment so that it enables them to do their job more effectively? In what way, for whom and how does the management and design permit, encourage or enhance: personal and group recognition; environmental control (heating; lighting; ventilation; amount and type of furniture; personalised space); social integration and identity; communication within the working group; communication with other working groups; appropriate levels of privacy? How are issues such individual/group identity; individual capacities, needs and preferences and working patterns reflected in space planning and the allocation of environmental resources? Is space and resource allocation used as a means of reflecting and rewarding status and marking distinctions between job classifications? Is the organisation prepared to redefine their understanding of equity and provide space and facilities on the basis of need rather than status?

There are many ways of looking at the relationship between corporate culture and physical facilities. The effective use of the organisation's resources lies not in fitting the staff to the workplace, but recognising that there will be a transaction between staff and workplace, so that if the employee cannot or will not be forced into the setting they will either attempt to modify the setting so that it does approximate more closely their working needs and preferences or they will become dissatisfied, disaffected and unproductive. For example, instead of assigning an employee just one space, consideration should be given to permitting if not encouraging. Instead of working in just one place (e.g., a desk), some companies are giving employees access to a number of spaces (e.g., 'hot-desking') that will allow them to undertake their tasks and with more satisfaction and effectiveness]. Within such an arrangement staff cannot claim territorial rights over specific spaces but are regarded as temporary lodgers for as long as they need that space: informal privacy spaces for talking to clients and colleagues; quiet, comfortable spaces for writing reports; workstations for undertaking word-processing, data analysis; meeting rooms for discussing

issues with colleagues, small refreshment areas for informal socialising; quiet, private telephone suites for confidential matters. There are various possibilities - the type of spaces will depend on the type of work and how it can be undertaken effectively.

Public Environments

Cities are a human creation. They concentrate novelty, intensity, and choice - more so than smaller towns and villages. They provide a variety of cultural, recreational, and educational facilities. Equally, it is argued, cities have become more dangerous, since they concentrate all sorts of crime and delinquency, and are noisy, overcrowded, and polluted. Three topics addressed at this environmental level are discussed here: the negative effects of cities, the visual impact of buildings and the restorative role of nature.

The Negative Effects of Cities. Living in metropolitan areas is considered as stressful. The analysis of behaviour in cities has concentrated on noise, density, living conditions (difficulty of access to services), high crime, and delinquency rates. A series of conceptual considerations have been proposed to understand the consequences of these stressors for typical urban behaviour like paying less attention to others, and being less affiliative and less helpful. Environmental overload, environmental stress, and behavioural constraint all point to the potentially negative effects of living in cities as compared with living in small towns. Environmental conditions like noise and crowding not only effect general urban conditions, but they also have a specific effect on behaviour. A comparison of behaviour at the same site but under different environmental conditions (noisy-quiet, high-low density) show a more marked negative effect in the case of high noise and high density (Moser, 1992). Higher crime and delinquency rates are commonly explained by the numerous opportunities the city offers, along with deindividuation (Zimbardo, 1969). The probability of being recognised is lower and the criminal can escape without being identified. Fear of crime (which is not necessarily correlated with objective crime rates) restricts people's behaviour by making them feel vulnerable. It is exacerbated by an environment which appears uncared for (for example, through littering, vandalism).

Whereas the effect of air pollution on health (e.g., respiratory problems for children and elderly) is well documented (Lewis *et al*, 1970; Godlee and Walker, 1992), it has little direct effect on the behaviour of urban residents. The relationship between exposure to air pollution and health is mediated by perceptions of the exposure (Elliot, Cole *et al*. 1999). The extent to which people feel they can control the source of air pollution, for instance, influences their response to this pollution. Perceptions of air pollution are also important because they influence people's response to certain air pollution management strategies. Whether or not people perceive air pollution as a problem is of course related to the actual existence of the problem. Generally, people are more likely to perceive environmental problems when they can hear (noise), see (smoke), smell, or feel them. Another important source of information is the media because the media's interpretation of pollution levels may have a social amplification effect and influence public perceptions and attitudes (Kasperson, Renn *et al*, 1988). People believe that heavy goods vehicles, commuters, and business traffic are the principal sources of urban air pollution. On the other hand, school traffic is often seen to be one of the most important causes of transport problems. It is often argued that reducing school trips by car would make a significant difference to urban transport problems. Paradoxically, although seen as a major source of congestion, school traffic is not seen as a major source of pollution (Gatersleben and Uzzell, 2000).

The Visual Impact of Buildings. The city is where the majority of us live. The architecture which surrounds us is more than public sculpture. Research on the visual impact of buildings demonstrates perhaps more than any other area that different user groups

perceive and evaluate the environment dissimilarly. The criteria used most widely by the public to assess the visual impact of a building is how contextually compatible it appears with the surrounding environment (Uzzell, 2000). Architects and their clients, however, tend to value more highly the distinctiveness and contrast of buildings. Although there is a place for both, the indication is that there are diverging points of view on what constitutes a desirable building between groups of people (Hubbard, 1994; 1996). Groat has found differences of opinion to be greatest between the public and architects and most similar between the public and planners (Groat, 1994). Several studies (e.g., Purcell & Nasar, 1992; Nasar, 1993) have demonstrated that architects and educated 'laypeople' differ in their preferences for building styles and in the meanings they infer from various styles. For example, Devlin and Nasar (1989) found that architects rated more unusual and distinctive residential architecture as more meaningful, clear, coherent, pleasant, and relaxing, whereas non-architects judged more conventional and popular residential architecture as such. Similarly, Nasar (1993) found that not only did architects differ from the public in their preferences and in the meanings they inferred from different styles, but they also misjudged the preferences of the public.

Individual design features such as colour, texture, illumination, the shape and the placement of windows can have a significant impact on evaluations. Overall, such research findings regarding order (including coherence, compatibility, congruity, legibility and clarity) have been reasonably consistent; increases in order have been found to enhance the evaluative quality of cities (Nasar, 1979), downtown street-scenes (Nasar, 1984) and residential scenes (Nasar, 1981, 1983).

The Restorative Role of Nature. Despite city living, many urban residents desire a private house with garden or at least to be able to visit urban parks and recreational areas. Urban residents often seek nature and research consistently points to its positive psychological function (Staats *et al*, 1997; Staats *et al*, 2000). Green spaces and the natural environment can provide not only an aesthetically pleasing setting, but also restorative experiences (Kaplan, 1995) including a positive effect on health (Ulrich, 1984; Moore, 1982). Gifford (1987) has summarised this research and identified the following main benefits of nature: cognitive freedom, escape, the experience of nature, ecosystem connectedness, growth, challenge, guidance, sociability, health, and self-control. What seems to be important is the sense of freedom and control felt in nature, in contrast to an urban environment which is perceived as constraining?

The Global environment

Local agendas are increasingly informed by global perspectives and processes (Lechner and Boli, 1999). The interaction between the local and the global is crucial and is the essence of globalisation. (Bauman, 1998; Beck, 1999). Although environmental issues are increasingly seen as international in terms of extent, impact and necessary response, social psychological studies have traditionally treated many environmental problems as locally centred and limited to a single country. Thus they have been de-contextualised in that not only has the local/global environmental dimension been minimised, but perhaps more significantly the local/global social psychological effects have also been minimised. This is well illustrated by Bonaiuto *et al* (1996) who examined the role of social identity processes as they manifest themselves in place (i.e., local) and national identity in the perception and evaluation of beach pollution. It was found that subjects who were more attracted to their town or their nation tended to perceive their local and national beaches as being less polluted.

Three phenomena – mass media coverage of environmental issues, the growth in environmental organisations and the placing of environmental issues on international political agendas – have, intentionally or unintentionally, emphasised the seriousness of global as opposed to local or even national environmental problems. On the other hand, it has been suggested that people are only able to relate to environmental issues if they are concrete, immediate, and local. Consequently, it might be hypothesised that people will consider environmental problems to be more serious at a local rather than global level. If this is the case then what is the effect of the public's perceptions of the seriousness of environmental problems on their sense of responsibility for taking action? In a series of cross-cultural studies undertaken in Australia, Ireland, Slovakia, and the UK, members of the public and environmental groups, environmental science students, and children were asked about the seriousness of various environmental problems in terms of their impact on the individual, the local area, the country, the continent and the world (Uzzell, 2000b). It was consistently found that respondents were not only able to conceptualise problems at a global level, but an inverse distance effect was found such that environmental problems were perceived to be more serious the farther away they are from the perceiver. This phenomenon occurred repeatedly in each country for all groups. An inverse relationship was also found between a sense of responsibility for environmental problems and spatial scale resulting in feelings of powerlessness at the global level.

We are increasingly conscious of the effect of global environmental processes on local climate. The effects of extreme weather conditions - wind, heat or extreme cold – as, for example, investigated by Suedfeld and others in Antarctic survey stations, have demonstrated various impacts on individuals (Suedfeld, 1998; Weiss, Suedfeld *et al*, 2000). The effect of seasonal daylight availability on mood has been described as seasonal affective disorder (Rosenthal *et al.*, 1984). Likewise, sunlight has been found to enhance positive mood (Cunningham, 1979).

The most significant topic analysed at the level of global environment is without doubt individuals' attitudes towards and support of sustainable development. A major challenge for environmental psychology is to enable the understanding and development of strategies to encourage environmentally friendly behaviour. There is consistent field research in environmental psychology about the ways to encourage environmentally responsible behaviour concerning resources conservation (e.g., energy and water), littering, and recycling. The effect of environmental education, commitment, modelling, feedback, rewards and disincentives, are on the whole effective only if such behaviour is reinforced and opportunities are provided which encourage environmentally friendly behaviour.

Growing ecological concern in our societies is attributed to a series of beliefs and attitudes favourable to the environment originally conceptualised by Dunlap (1980) and Dunlap and Van Liere (1984) as the 'New Environmental Paradigm' and now superseded by the New Ecological Paradigm Scale (Dunlap, Van Liere *et al*, 2000). But it is clear from research that pro-environmental attitudes do not necessarily lead to pro-environmental behaviours. Environmental problems can often be conceptualised as 'commons dilemma' problems (Vlek, *et al.*, 1993; Van Lange, *et al.*, 1998). In psychology, this is referred to as a social dilemma. The defining characteristics of such dilemmas are that a) each participant receives more benefits and less costs for a self-interest choice (e.g., going by car) than for a public interest choice (e.g., cycling) and b) all participants as a group, would benefit more if they all choose to act in the public interest (e.g., cycling) than if they all choose to act in self-interest (e.g., going by car) (Gatersleben and Uzzell, forthcoming). The social dilemma paradigm can explain why many people prefer to travel by car, even though they are aware of the environmental costs of car use and believe more sustainable transport options are necessary. It is in the self-interest of every individual to use cars. Nevertheless, it is in the

common interest to use other modes of transport. However, the problems of car use are neither caused by nor can single individuals solve them. They are typically collective problems. People therefore do feel neither personally responsible for the problems nor do they feel in control of the solutions.

THEORETICAL PERSPECTIVES ON KEY QUESTIONS IN ENVIRONMENTAL PSYCHOLOGY

It was suggested at the beginning of this chapter that the context – the environment – in which people act out their lives is a critical factor in understanding human perceptions, attitudes, and behaviour. Psychologists have largely ignored this context assuming most explanation for behaviour is largely person-centred, rather than person-in-environment centred. Because environmental psychologists are in a position to understand person-in-environment questions, the history of environmental psychology has been strongly influenced by the need to answer questions posed by the practical concerns of architects, planners and other professions responsible for the planning, design and management of the environment (Uzzell, 2000a). These questions include: how does the environmental stimulate behaviour and what happens with excessive stimulation? How does the environment constrain and cause stress? How do we form maps of the environment in our heads and use them to navigate through the environment? What factors are important in people's evaluation of the built and natural environment and how satisfied are they with different environments and environmental conditions? What is the influence of the environment or behaviour setting on people? What are the physical properties of the environment that facilitate some behaviour and discourage others? Do we have a sense of place? What effect does this have on our identity? In this section we outline some of the approaches that have been taken to answering these questions.

Typically within environmental psychology these questions have been addressed from one of three perspectives. First, from a deterministic and essentially behaviourist perspective that argues that the environment has a direct impact on people's perceptions, attitudes, and behaviour. The second approach has been referred to as interactionism – the environment impacts upon individuals and groups, who in turn respond by impacting upon the environment. The third perspective is transactional in which neither the person nor environment has priority nor neither can one be defined without reference to the other. Bonnes and Secchiaroli (1995) suggest that transactionalism has two primary features: the continuous exchange and reciprocity between the individual and the environment, and the primarily active and intentional role of the individual to the environment.

It is impossible in a chapter of this length to discuss all the theories which have driven environmental psychology research. The varying scales at which environmental psychologists work, as we have seen, assume different models of man, make different assumptions about people-environment and environment-behaviour relations, require different methodologies and involve different interpretive frameworks. In this section we discuss the three principal approaches which have been employed in environmental psychology to account for people's behavioural response to their environmental settings.

Deterministic and Behaviourist Approaches

Arousal theory, environmental load, and adaptation level provide good illustrations of theories which are essentially behaviourist in their assumptions and determinist in their environment-behaviour orientation.

Arousal theory: Arousal theory stipulates that the environment provides a certain amount of physiological stimulation which, depending on the individual's interpretation and attribution of the causes, has particular behavioural effects. Each particular behaviour is best performed at a definite level of arousal. The relation between levels of arousal and optimal performance or behaviour is curvilinear (Yerkes-Dodson law). Whereas individuals seek stimulation when arousal is too low, too high levels of arousal produced by either pleasant or unpleasant stimulation or experiences have negative effects on performance and behaviour. Anomic behaviour in urban environments is attributed to high stimulation levels due to environmental conditions like excessive noise or crowding (Cohen and Spacapan, 1984). On the other hand, under-stimulation may occur in certain environments like the arctic causing unease and depression (Suedfeld and Steel, 2000).

The environmental load or over-stimulation approach: According to this model people have a limited capacity to process incoming stimuli, and overload occurs when the amount of incoming stimuli exceed the individual's capacity to process them. Individuals deal with an overloaded situation by concentrating their attention on the most important aspects of a task or focusing on a fixed goal, ignoring peripheral stimulation in order to avoid distraction. Paying attention to a particular task in an overloaded situation is very demanding and produces fatigue (Kaplan and Kaplan, 1989). Typical after-effects of being exposed to an overload situation are, according to the overload model, less tolerance to frustration, less attention and reduced capacity to react in an adaptive way. Milgram (1970) attributes the deterioration of social life in cities to the wide variety of demands on citizens causing a reduced capacity to pay attention to others. The overload approach explains why certain environmental conditions lead to undesirable behavioural consequences like aggression, lack of helping behaviour and selfishness in urban environments.

Adaptation level theory: Adaptation level theory (Wohlwill, 1974) is in certain ways a logical extension of arousal theory and the overload approach. It assumes that there is an intermediate level of stimulation which is individually optimal. Three categories of stimulation can be distinguished: sensory stimulation, social stimulation, and movement. These categories can be described along three dimensions of stimulation: intensity, diversity, and patterning (i.e., the structure and degree of uncertainty of the stimulation). In ideal circumstances, a stimulus has to be of average intensity, reasonably diverse and must be structured with a reasonable degree of uncertainty. The level of stimulation at which an individual feels comfortable depends on his/her past experience, or more precisely the environmental conditions under which he or she has grown up. This reference level is nevertheless subject to adaptation when the individual changes their life environment. If rural people can be very unsettled by urban environments, they may also adapt to this new situation after a certain period of residence. Adaptation level theory postulates an active and dynamic relation of the individual with his/her environment.

Interactionist Approaches

Analyses of the individual's exposure to environmental stressor in terms of control and of behavioural elasticity on one hand, and environmental cognition (cognitive mapping, environmental evaluations, etc.) on the other hand, refer typically to an interactionist rational of individual-environment relations.

Stress and Control: Some authors (Proshansky, Ittelson and Rivlin, 1970; Stokols, 1978, Zlutnick and Altman, 1972) consider certain environmental conditions as being constraining to the individual. Similarly, others (Baum, Singer and Baum, 1981, Evans and Cohen, 1987; Lazarus and Folkman, 1984) describe such situations as being stressful. Both approaches lead to conditions as being potentially constraining or stressful, and introduce the concept of 'control'. Individuals exposed to such situations engage in coping processes. Coping is an attempt to re-establish or gain control over the situation identified as stressing or constraining. According to the psychological stress model, environmental conditions such as noise, crowding or daily hassles provoke physiological, emotional, and behavioural reactions identified as stress (Lazarus, 1966). Three types of stressors can be distinguished: cataclysmic events (e.g., volcanic eruptions, floods, and earthquakes), personal life events (e.g., illness, death, family, or work problems), and background conditions (e.g., transportation difficulties, access to services, noise, crowding). Such conditions are potentially stressful according to their nature provided that the individual identifies them as such (Cohen *et al.*, 1986).

An environment is constraining when something is limiting or prevents the individual from achieving their intentions. This may occur with environmental conditions or stressors like noise or crowding, but also with specific environmental features like fences, barriers, or bad weather. The constraining situation is interpreted by the individual as being out of his/her control. The feeling of not being able to master the situation produces psychological reactance (Brehm, 1966). Unpleasant feelings of being constrained lead the individual to attempt to recover his/her freedom of action in controlling the situation. Having freedom of action or controlling one's environment seems to be an important aspect of everyday life and individuals' well-being. When people perceive control in a noisy situation, their performance is improved (Glass and Singer, 1972), they are less aggressive (Donnerstein and Wilson, 1976; Moser and Lévy-Leboyer, 1985), and they are more often helpful (Sherrod and Dowes, 1974). On the contrary, the perception of loss of control produced by a stressful situation or constraints has several negative consequences on behaviour (Barnes, 1981) as well as on well-being and health.

Confronted with a potentially stressful condition, the individual appraises the situation. Appraisals involve both assessing the situation (primary appraisal) and evaluating the possibilities of cope with it (secondary appraisal). The identification of a situation as being stressful depends on cognitive appraisal. Cognitive appraisal of a situation as being potentially disturbing or threatening or even harmful, involves an interaction between the objective characteristics of the situation as well as the individual's interpretation of the situation in the light of past experience. The secondary appraisal leads to consider the situation as challenging with reference to a coping strategy. Coping strategies depend on individual and situational factors. They consist of problem-focused direct action like fleeing the situation, trying to stop, remove, or reduce the identified stressor, or cognitive and emotion-focused reactions such as re-evaluating the threatening aspects of the situation. Reaction to a stressful situation may lead the individual to concentrate on the task, focusing on the goals, ignore, or even deny the distracting stimuli. Repeated or steady exposure to stressors may result in adaptation and therefore weaker reactions to this type of situation. If the threatening character of the situation exceeds the coping capacities of the individual, this may cause fatigue and a sense of helplessness (Garber and Seligman, 1981; Seligman, 1975).

The stress-adaptation model: In everyday life, the individual is exposed to both background stressors and occasionally to excessive environmental stimulation. Consequently, the individual's behaviour can only be appreciated when considered in a context perceived and evaluated by the person themselves and in reference to baseline exposure (Moser, 1992). Any exposure to a constraining or disagreeable stimulus invokes a neuro-vegetative reaction. Confronted with such stimulation, the individual mobilises

cognitive strategies and evaluates the aversive situation with reference to her or his threshold of individual and situational tolerance, as well as the context in which exposure occurs. This evaluation creates a stimulation level which is judged against a personal norm of exposure. In response the individual judges the stimulus as being weak, average and tolerable, or strong. Cognitive processes intervene to permit the individual to engage in adaptive behaviour to control the situation. A situation in which the constraints are too high or in which stimulation is excessive, produces increased physiological arousal thereby preventing any cognitive intervention and therefore also control of the situation.

Behavioural elasticity. This model introduces the temporal dimension of exposure to environmental conditions, and refers to individual norms of exposure (Moser, 2002, forthcoming). The influence of stressors is well-documented, but the findings are rarely analysed in terms of adaptation to long term or before-after comparisons. Yet one can assume that where there are no constraining factors the individual will revert to their own set of norms which are elaborated through their history of exposure. The principle of elasticity provides a good illustration of individual behaviour in the context of environmental conditions. Using the principle of elasticity from solids mechanics to characterise the adaptive capacities of individuals exposed to environmental constraints, three essential behavioural specificities as a consequence of changing environmental contingencies can be distinguished: (1) returning to an earlier state, that is a point of reference, in which constraints were not present; (2) the ability to adapt to a state of constraint as long as the constraint is permanent; (3) the existence of limits on one's flexibility. The latter becomes manifest through reduced flexibility in the face of increased constraints, the existence of a breaking point, (when the constraints are too great), and by the progressive reduction of elasticity as a function of both continuous constraints and of ageing.

(1) *Returning to an earlier 'base-line'.* While attention is mostly given to attitude change and modifying behaviour in particular situations, the stability over time of these behaviours is rarely analysed. Yet longitudinal research often shows that pro-environmental behaviour resorts to the initial state before the constraints were encountered. This has been shown for instance in the context of encouraging people to sort their domestic waste (Moser and Matheau, in press) or in levels of concern about global environmental issues (Uzzell, 2000b). Exposure to constraints creates disequilibrium and the individual, having a tendency to reincorporate initial behaviour, reverts to the earlier state of equilibrium.

(2) *Adaptation - the ability to put up with a constraining situation in so far as it is continuous.* Observing behaviour in the urban environment provides evidence of the constraining conditions of the urban context. Residents of large cities walk faster in the street and demonstrate greater withdrawal than those living in small towns: they look straight ahead, only rarely maintain eye-contact with others, and respond less frequently to the various requests for help from other people. In other words, faced with an over-stimulating urban environment, people use a filtering process by which they focus their attention on those requests they evaluate as important, disregarding peripheral stimulation. The constant expression of this type of adaptive behaviour suggests that it has become normative. The walking speed of inhabitants of small towns is slower than the walking speeds of inhabitants on large cities (Bornstein, 1979). So we can assert that such behaviour provides evidence of the individual's capacity to respond to particular environmentally constraining conditions.

(3) *The extent and limits of flexibility:* The limits of flexibility and, more particularly, the breakdown following constraints which are too great, are best seen in aggressive behaviour. The distinction between instrumental and hostile aggression (Feshbach, 1964), recalls the distinction between adaptive behaviour aimed at effectively confronting a threat and a reactive and impulsive behaviour ineffectual for adaptation. Three limits of flexibility can be

identified: (a) reduced flexibility in the face of increased constraints. When exposure to accustomed constraints is relatively high, there is a lower probability of performing an adaptive response, and therefore an increase in reactive behaviours. There is decreased flexibility in the face of constraint, more so if the constraint is added onto already existing constraints affecting the individual. This is most clearly evident in aggressive behaviours (Moser, 1984). People react more strongly to the same stimulation in the urban environment than in small towns. Hostile aggression thus becomes more frequent. This results in a decrease in adaptive capacities and therefore of flexibility, if additional constraints are 'grafted' onto those already present. (b) The existence of a breaking point when the constraints are too great: Intervention by cognitive processes is prevented if stimulation produces too extreme a neuro-vegetative reaction (Zillmann, 1978, Moser, 1992). This is most evident with violent or hostile aggressive behaviour. This involves non-adaptive reactive behaviour which is clearly of a different order. As a consequence, breakdown and a limit on flexibility results. Yet, contrary to what occurs when there is elasticity, this breakdown fortunately occurs only occasionally, on an *ad hoc* basis. (c) The progressive loss of elasticity as a function of the persistence of exposure to constraints: This has been examined under laboratory conditions in the form of post-exposure effects. Outside the laboratory, the constant mobilisation of coping processes, for example, for those living near airports produces fatigue and lowers the capacity to face new stressful situations (Altman, 1975). One encounters, in particular, greater vulnerability and irritability and a significant decrease in the ability to resist stressful events. These effects demonstrate that there is a decreased tolerance threshold, and so a decreased flexibility following prolonged exposure to different environmental constraints.

The elasticity model is an appropriate framework to illustrate the mechanisms and limits of behavioural plasticity. It may perhaps stimulate the generation of a model of behavioural adjustments by placing an emphasis on the temporal dimension and the cognitive processes governing behaviour. Environmental cognition, cognitive mapping, and environmental appraisals are likely to fall within an interactionist framework. While they can be individualistic, they are invariably set within a social context. Environmental cognition would be enriched by more research in terms of social representations (Moscovici, 1989) providing the opportunity to emphasize the role of cultural values, aspirations and needs as a frame of reference for environmental behaviour.

Cognitive mapping

How do we form maps of the environment in our heads and use them to navigate through the environment? Cognition and memory of places produce mental images of our environment. The individual has an organised mental representation of his/her environment (e.g., neighbourhood, district, city, specific places) which environmental psychologists call cognitive maps. Cities need to be legible so that people can 'read' and navigate them. The study of cognitive maps has its origin in the work of Tolman (1948) who studied the way in which rats find their way in mazes. Lynch (1960), an urban planner, introduced the topic and a methodology to study the way people perceive the urban environment. Lynch established a simple but effective method to collect and analyse mental maps. He suggested that people categorise the city according to five key elements: paths (e.g., streets, lanes), edges (e.g., spatial limits: rivers, railtracks); districts (e.g., larger spatial areas or neighbourhoods that have specific characteristics and are typically named, such as 'Soho'); nodes (e.g., intersections, plazas); and landmarks (e.g., reference points for the majority of people).

Furthermore, one can distinguish sequential representations (i.e., elements that the individual encounters when travelling from one point of the city to another, rich in paths and nodes) and spatial representations emphasising landmarks and districts (Appleyard, 1970).

Cognitive maps will vary, for example, as a function of familiarity with the city and stage in the lifecycle. Such maps can be used either to characterise an individual's specific environment interests or preferences (Milgram & Jodelet, 1976), or the qualities and legibility of a particular environment (Gärling and Evans, 1991; Kitchen, Blades and Golledge, 1997). Wayfinding is a complex process involving a variety of cognitive operations like localisation of the target and choosing the route and the type of transportation to reach the goal (Gärling *et al.* 1986). Sketch maps often carry typical errors that point to the cognitive elaboration of the individual's environmental representation: non-exhaustive; spatial distortions (too close, too apart); simplification of paths and spaces; overestimation of the size of familiar places.

Environmental evaluations.

What factors are important in people's evaluation of the built and natural environment and how satisfied are they with different environments and environmental conditions? Some environmental evaluations called the place-centred method, focus on the objective physical properties of the environment such as pollution levels or the amount of urban development over the previous ten years. The aim is to measure the qualities of an environment by 'experts' or by actual or potential users. Such evaluations are done without taking into account the referential framework of the evaluator, i.e. the values, preferences, or significations attached to the place. These kinds of appraisals are important, but when it is remembered that what may be an environmental problem for one person may be of no consequence to another, it is clear that environmental assessment also has an important subjective dimension. This is called the 'person-centred method' and focuses on the feelings, subjective appreciation of, and satisfaction with a particular environment (Craig and Zube, 1976; Russell and Lanius, 1984).

Some environmental appraisals take the form of contrasting social categories such as architects *versus* the public (Groat, 1994; Hubbard, 1994) or scientists *versus* lay people (Mertz, Slovic *et al.*, 1998), or categorising people who hold particular attitudes (e.g., pro/anti conservation: Nord, Luloff *et al.*, 1998). The focus of attention is on the role the individual occupies or the attitudes held and the consequent effect that this has on environmental attitudes and behaviour.

Evaluations can either be carried out in the environment which is being evaluated, or they can be undertaken through simulations. Horswill and McKenna (1999) have developed a video-based technique for measuring drivers' speed choice which has the advantage of maintaining experimental control and ensuring external and ecological validity. They found that speed choice during video simulation related highly to real driving experiences. Research consistently confirms colour photographs as a valid measure of on-site response, especially for visual issues (Nasar and Hong, 1999; Stamps, 1990; Brown, Daniel, Richards and King, 1988; Bateson and Hui, 1992). Stamps (1990) conducted a meta-analysis of research that had previously used simulated environments to measure perceptions of real *versus* photographed environments (e.g., presented as slides, colour prints and black and white prints). He demonstrated that there is highly significant correlation between evaluations of real and simulated (photographed) environments. The advent of digital imaging means that it is now possible to 'manipulate' photographs so that environments can be changed in a systematic and highly convincing way in order to assess public preferences and reactions. The photographs in Figure 1 were manipulated with the intention of assessing the impact of different traffic calming measures on drivers' estimates of speed (Uzzell and Leach, 2001). The research demonstrated that drivers clearly were able to discriminate between the different conditions presented in manipulated photographs. When estimated speeds were correlated against actual speeds along the road as it exists at present this suggested which design solutions would lead to an increase or decrease in speeding behaviour.

Figure 1: The use of digitally manipulated photographs to assessing the impact of alternative traffic calming measures on drivers' estimates of speed



Transactional Approaches

Three approaches are discussed here as examples of transactional approaches in environmental psychology: Barker's behaviour setting approach, affordances, place theory, identity, and attachment

Barker's Behaviour Settings

Barker's behaviour settings approach has both a theoretical and methodological importance as it provides a framework for analysing the logic of behaviour in particular settings. Barker (1968, 1990) considered the environment as a place where prescribed patterns of behaviour, called programs, occur. There is a correspondence between the nature of the physical milieu and a determined number and type of collective behaviour taking place in it. According to ecological psychology, knowing the setting will provide information about the number of programs (i.e., behaviours) in it. Such programs are recurrent activities, regularly performed by persons holding specific roles. A church, for instance, induces behaviours like explaining, listening, praying, singing, etc., but each type of activity is performed by persons endorsing specific roles. According to his/her role, the priest is a 'performer' and the congregation are 'non-performers'. This setting also has a layout and particular furniture which fits that purpose and fixes the program, i.e. what type of behaviour should happen in it? The so called 'behaviour setting' (i.e., the physical place and the behaviours) determines what type of behaviour is appropriate and therefore can or should occur. Patterns of behaviour (e.g., worshipping) as well as settings (e.g., churches) are nevertheless independent: a religious office can be held in the open air, and the church can be used for a concert. It is their role-environment structure or synomorphology that create the behaviour setting. Barker's analysis supposes interdependency between collective patterns of behaviour, the program, and the physical space or milieu in which these

behaviours take place. Behaviours are supposed to be unique in the specific setting and dependent on the setting in which they occur. *Settings* are delimited places such as within walls, fences, or symbolic barriers. They can be identified and described. Barriers between settings also delimit programs. Knowing about the setting (e.g., its purpose or intention) infers the typical behaviours of the people in that setting. Barker's conceptualisation permits an understanding of environment-behaviour relationships such that space might be organised in a certain way in order to meet its various purposes. Behaviour settings are dynamic structures that evolve over time (Wicker, 1979, 1987).

Staffing (formerly *manning*) theory completes Barker's approach, by proposing a set of concepts related to the number of people the behaviour setting needs in order to be functional (Barker, 1960, Wicker and Kirkmeyer, 1976). Beside key concepts like *performers* who carry out the primary tasks, and the *non-performers* who observe, the minimum number of people needed to maintain the functioning of a behaviour setting is called the *maintenance minimum*, and the maximum, its *capacity*. *Applicants* are people seeking to become part of the behaviour setting. Overstaffing or understaffing is a consequence of too few or too many applicants for a behaviour setting. The consequences of understaffing are that people have to work harder and must endorse a greater range of different roles in order to maintain the functioning of the setting. They will also feel more committed to the group and endorse more important roles. On the other hand, overstaffing requires the fulfilment of adaptive measures to maintain the functioning, such as increasing the size of the setting.

Behaviour settings and staffing theory are helpful tools to solve environmental design problems and to improve the functioning of environments. Barker's approach has been successfully applied to the analyses of work environments, schools, and small towns. It helps to document community life and enables the evaluation of the structure of organisations in terms of efficiency and responsibility.

Affordance theory

Gibson (1979) argues that, contrary to the orthodox view held in the design professions, people do not see form and shape when perceiving a place. Rather, the environment can be seen as offering a set of 'affordances'; that is, the environment is assessed in terms of what it can do for us. The design professions are typically taught that the building blocks of perception comprise shape, colour, and form. This stems from the view that architecture and landscape architecture is often taught as a visual art rather than a way of providing functional space in which people can work, live, and engage in recreation. Gibson argues that 'the affordances of the environment are what it offers the animal, what it provides or furnishes either for good or ill' (Gibson, 1979, p. 127). Affordances are ecological resources from a functional point of view. They are an objectively specifiable and psychologically meaningful taxonomy of the environment. The environment offers opportunities for use and manipulation. How we use the environment as children, parents or senior citizens will vary depending upon our needs and interests, values and aspirations.

This perspective suggests that the degree to which built or natural environments are utilised change as people's roles, relationships, and activities in the environment change. Therefore, the environment can be seen to have a developmental dimension to it. As people develop their cognitive, affective, and behavioural capacities, the resources that the environment offers change. Furthermore, the environment can be designed to facilitate, support, and encourage this. Heft (1988) argues that utilising Gibson's theory of affordances allows us to describe environmental features in terms of their functional significance for an individual or group. He postulated that to arrive at a functional description of an environment, one requires three sorts of information; the characteristics of the person, the characteristics of the environment and the behaviour of the individual in question. Heft

(1988) was interested in children's environment-behaviour interactions, with the aim of creating a taxonomy that would describe the functionally significant properties of children's environments. Based on his analysis of three significant books on children's use of their environment (Barker and Wright, 1951; Hart, 1979; Moore, 1986), Heft created a functional taxonomy of children's outdoor environments in terms of the environmental features and activities they afford for the child. The ten environmental features were: flat, relatively smooth surface; relatively smooth slope; graspable/detached object; attached object; non-rigid, attached object; climbable feature; aperture; shelter; moldable materials; water.

Heft also pointed out that as there is a developmental aspect to the taxonomy, the value of the environment will change for the developing child. As children move from pre-teenagers through to adolescence so the affordances of different types of environments change in response to their need for social interaction and privacy (Woolley *et al.* 1999). Clark and Uzzell (forthcoming) found the use of the neighbourhood for interaction decreased with age and by the time the young people had reached 11 years old the number of affordances was significantly lower than for those aged 7 years old. There was no decrease in the use of the neighbourhood for retreat. Therefore the neighbourhood retains its importance for retreat behaviours.

Exemplifying Bonaiuto and Bonnes' (1996) assertion that the experience of small and large city living is notably different, Kyttä (1995) examined children's activities in the city, a small town and a rural area in Finland. Using the affordance approach but including categories on social affordances and nature, Kyttä found that the number of positive affordances was highest in the rural area and lowest in the city. However, when the quality of affordances was analysed, there were no differences between the areas for eight out of the eleven affordance categories. The attitudes of parents play a significant role in how children perceive affordances. Children with a limited autonomy over their spatial range, due to parental restrictions through fears about safety, see little of the environment and therefore its affordances.

Theories of Place, Place Identity, and Place Attachment.

One of the earliest theories of place was proposed by Canter (1977), who's conceptual, as opposed to behavioural, model proposed that the cognitive system contains information about where places are, what is likely to happen there and who is likely to be present. Canter defined place as 'a unit of environmental experience' and postulated that the unit of place was the result of the relationships between actions (i.e., behaviour is associated or anticipated), conceptions and physical attributes.

A second influential theory of place is the transactional theory of Stokols and Shumaker (1981) who defined place as the 'entity between aspects of meaning, physical properties, and relative activity'. This is not so dissimilar from Canter's notions of actions, conceptions, and physical properties. Stokols and Shumaker emphasise the collective perceptions of place and propose that a place has a 'social imageability'. This imageability is the collectively held social meanings that the place has amongst its occupants or users. Within social psychology these would be called social representations (Farr and Moscovici, 1984; Moscovici, 1989). Stokols proposed that there are three dimensions that contribute to a group's 'social imageability' of place: *functions*, *goals*, and *evaluations*. Functions are individual or group activities that occur within the place regularly and include the norms associated with the activities and the identity and social roles of the occupants/users of the place; goals can be either personal or collective and relate to the purpose of the place; evaluations include the occupants, physical features, social functions associated with the place.

Thus, Stokols and Shumaker conclude that the perceived social imageability of a place is the result of the functional, motivational, and evaluative meanings conveyed by the environment. Stokols places particular emphasis upon the functional dimension of place and the need to explore the affective and motivational processes in the relationship between people and place. As Bonnes and Secchiaroli (1995) point out, to live in an environment does not mean structuring experiences only with respect to its physical reality. Places carry a role in the fulfilment of biological, cultural, psychological, and social needs of the person in the many situations that they will face over their lifetime.

One such role is their contribution to personal and group identity. There are two ways in which place has been related to identity. The first is what could be referred to as *place identification*. This refers to a person's expressed identification with a place. For example, a person from London may refer to themselves as a Londoner. In this sense "Londoner" can be considered to be a social category and will be subject to the same rules as a social identification within social identity theory. Hogg and Abrams (1988) suggest that social identity comprises different social identifications, any one of which will become salient depending on the context. Taking this position suggests that the concept of place identity is subsumed into and becomes a part of social identity.

The second way in which place has been related to identity is through the term *place identity*, a construct promoted by Proshansky *et al* (1983, 1987) which calls for a more radical re-evaluation of the construct of identity. He proposes that place identity is another aspect of identity comparable to social identity that describes the person's socialisation with the physical world. This understanding stands place identity alongside and independent of self identity, rather than subsumed within it.

Whilst it may be possible to discuss the relationship between the physical environment and identity without reference to a group, to have two forms of identity would focus discussion on whether or not identity was more 'social' or more 'place'. This would not seem to be useful in explanatory terms. In addition it contradicts environmental psychologists' transactional perspective on place (Sageart and Winkel, 1990). Although we agree with Proshansky that there has been a neglect of the physical environment by self-theorists, we would suggest that rather than there being a separate part of identity concerned with place, all aspects of identity will, to a greater or lesser extent, have place-related implications. Although place identity is seen to be a crucial part of the relationship between self and environment, Proshansky never really operationalised the concept. Breakwell's identity process model (1986), with its constructs of distinctiveness, continuity, self-esteem, and self-efficacy, provides such an investigatory and analytical framework. Although these constructs have a particularly social orientation in Breakwell's formulation, they nevertheless would seem to have useful transfer relevance to other dimensions of identity including place (Uzzell, 1995; Bonaiuto *et al*, 1996). For example, distinctiveness and continuity are essential elements in Korpela (1989) and Lalli's (1992) conceptualisations of place identity.

One important mechanism through which place identity is supported is place attachment. Spencer and Woolley (2000), for example, argue that children gain their personal identity through place attachment. Place attachment refers to an emotional bonding between the individual and their lifespace which could be the home, the neighbourhood or places and spaces at a larger scale (Giuliani, 1991, Altman and Low, 1992; Giuliani and Feldman, 1993).

Time, Space and the Future of Environmental Psychology

Needs and Rights in Environmental Psychology

The emphasis of much environmental psychology has been on identifying and then assisting in the process of providing for and satisfying people's needs. It is assumed within the philosophy of Brandt and Bruntland that environmental needs should be defined by those in power (i.e. the West), not the people whose needs are supposedly being satisfied. This form of donor benevolence as a strategy for tackling environmental deficits operates at the local, national, and international level. Thus, it is argued, we need to conserve the rainforests, wildlife, energy, water supplies and prevent pollution, etc. The West finds it difficult to understand why those experiencing environmental degradation, but also suffering poverty, malnutrition, poor housing, unemployment, high mortality rates have different priorities. The *needs*-based approach is often carried through to be an assumption which guides environmental psychology research.

An alternative approach focuses on *environmental rights* in which those without power define their needs themselves and try to secure the rightful access to resources to satisfy those needs. There is a difficulty with trying to integrate a bottom-up 'rights' approach with a top-down 'needs-driven' approach because one is faced with the problem of who sets the agenda. Groups will have difficulties asserting their rights when the allocation processes and agendas are structured by others. A 'rights' approach does not mean that neither help nor resources are required nor given. Clearly it is essential that the 'haves' of the world continue to provide for the 'have nots', but within a context of participation, self-determination, transparency in decision-making and accountability by all concerned. The essential factor is that the starting point for discussing the allocation of resources is different.

Long term change and development will only come about through informed community action, rather than a dependency relationship on experts and technological-fix solutions. The development of environmental consciousness and capacities without the simultaneous development of opportunities for action leads to a feeling of powerlessness (Uzzell, 1999). For this reason co-operation between all agencies and institutions is necessary in order to secure action opportunities. Psychologists in general and environmental psychologists in particular have the expertise and experience to play an important role in this process. It is here that we can see the value of research in suggesting prescriptive roles and functions for an environmental psychology which should be taken seriously by policy makers and practitioners alike. Some have suggested that the implementation of sustainable development through, for example, Local Agenda 21 initiatives will only be possible with local community consensus, (Robinson, 1997). Petts (1995) argues that traditional participatory approaches have been reactive in that the public are expected to respond simply to previously formulated plans. The trend now is for proactive, consensus building approaches which attempt to involve people in the decision-making process itself.

Cultural Differences and Temporal Processes

Environmental psychology, like other areas of psychology, has focussed almost exclusively on topics, theories, and methodologies which have been oriented towards Western assumptions and worldviews. Two topics seem to have been neglected in environmental psychology as they have in other areas of psychology: *cultural differences and temporal processes*. Both approaches are even more important at the beginning of the 21st century as on the one hand the processes of *globalisation* have the effect of destroying cultural differences, and on the other hand, *sustainable development* is seen as a way of ensuring the long term integrity of bio-cultural systems.

By defining sustainable development as “development that meets the need of the present without compromising the ability of future generations to meet their own needs”, the *Bruntland Report* (1987) opened the way to concerns related to quality of life. The reference to needs allows not only the requirement that development be harmonious towards and respectful of the environment, but equally for the recognition of the individual’s own well-being. Of course, the issue posed above requires us to consider whether we should be thinking in terms of needs or rights, and indeed, whose needs and whose rights?

Globalisation and its corollary, global trade and communications, creates pressure towards cultural uniformity in life-styles. The progressive deployment of globalisation has brought on, with reason, fear of a standardisation of values and increased anonymity threatening both individual and group identity. It gives rise to movements demanding recognition of local, regional, and national priorities and cultural differences and therefore also specific needs. This search for identity finds its expression spatially. Furthermore, the increase in regional, national, and international forced or voluntary mobility (e.g., political refugees and asylum-seekers, economic migration of job-seeking populations; executives dislocated by their companies) exacerbates confrontations between cultures with different needs, values, and customs. Globalisation provides the impetus to situate environmental psychology in a more globally, and at the same time, culturally relative framework. The traditional concepts of local community, environmental appropriation, and identity take on new meanings in the context of sustainable development and globalisation.

The Cultural Dimension

Quality of life standards are culturally determined. Needs concerning personal space, social life in the neighbourhood and urban experience are different from one culture to another. Furthermore, acting in sustainable ways depends on culturally marked values concerning the environment. From a globalisation perspective how universal is the need for personal space and privacy? Are they the same everywhere? Research in environmental psychology has taught us that, for instance, spatial needs vary both from one culture to another and also on one’s stage in the lifecycle. (Sundstrom, 1978; Altman, 1975). Some studies, such as Nasar and Min (1984) show that people living in the Mediterranean region and in Asia react very differently to confined spatial arrangements. But many such studies are conducted in a culturally homogeneous environment, and so only allow for conclusions concerning interpersonal differences related to the cultural origins of the research participants (see, for example, Loo and Ong, 1984). We need more longitudinal research and intercultural studies such as those undertaken to study reactions to density and spatial needs

The norms, needs, and strategies for adapting to conditions very different from our own are likely to provide us with insights on the dynamics of how people relate to the physical and social dimensions of both their and our environments. Such studies should be able to answer these questions more systematically. Privacy may signify and represent very different conditions not only at the individual level, but also between different cultures (Altman and Chemers, 1980). Individual *versus* collective housing preferences and the use of different facilities inside and around the dwelling are all culturally defined. While individual dwelling units appear as an ideal in Anglo-Saxon cultural settings, in some Latin American societies, there is a stronger preference for collective housing units, particularly in Brazil, mainly for reasons of increased security. More systematic research in this area should be able to provide guidelines for architects and designers, allowing them to take account of culturally-dependent needs beyond the simplistic notions of conception and layout (such as kitchens clearly separated from dining rooms). Kent (1991) has proposed a classification of different cultural groups according to their use of domestic space. Such a distinction is particularly relevant to the functional segmentation of spatial arrangements. Kent noted that

occupants remodel their domestic environment to fit their own cultural imperatives if they find themselves in an environment which fails to correspond to their own cultural standards. Well-being has different meanings in different cultures, and instead of imposing western standards, environmental psychology should contribute more to identifying culturally-specific standards to enable the construction of modular spaces to satisfy diversified needs. This becomes more important than ever in the context of an increasingly mobile (forced or voluntary) society.

At the neighbourhood level, well-being depends on how the immediate environment is able to satisfy the specific needs of culturally different people, thereby providing opportunities for appropriation. Currently there is a preference for homogenisation of populations within neighbourhoods. Yet arguably, such a strategy may pose more risks for the future than encouraging a process of heterogeneity in terms of the impact on how we perceive others and how we perceive space occupied by 'foreigners'. These are classic lessons which can be learnt from social psychology (Tajfel, 1982). Neighbourhoods not directly controlled or appropriated by the individual can lead to antagonism between culturally different communities. More socio-cultural research on living in areas with heterogeneous populations and trans-cultural relations should be undertaken in order to identify barriers to integration.

Environmental psychology has repeatedly pointed to the negative consequences of living conditions in large urban centres: anonymity, insecurity, indifference to others and exposure to various types of stress (Moser, 1992). This presents a rather dark portrait of urban living conditions. An environmental psychology has emerged which has deprecated urban centres and lauded the virtues of supposedly more attractive suburban residential environments (Lindberg, Hartig, Garvill and Gärling, 1992). Taking the Anglo-Saxon single-family house as its model (Cooper, 1972; Thorne, Hall and Munro-Clark, 1982), this approach has failed to account for what is happening in cities such as Paris where the city centre is invariably highly valued as a thriving, attractive, and lively residential as well as commercial and cultural environment. Two-thirds of those living in the Paris region indicate they would prefer to live within the 'walls' of Paris itself, while one-fifth would prefer to live in a small provincial town and only 15% show a preference for the Parisian suburbs (Moser, Ratiu & Fleury-Bahi, 2002). Such results are in direct contrast to those found in the United States. The American experience cannot be taken as the norm; unfortunately this is often the case in environmental psychology and other branches of psychology. These differences go beyond merely the characteristics of urban and suburban environments and raise questions concerning the aspirations and needs of city-dwellers and the processes which are generating the transformation of cities. Inhabitants of large cities are increasingly culturally diverse and, as a consequence, so are their needs. How do cities manage the influx of foreign populations, some of them culturally very different? What are the conditions of territorial appropriation of ethnic and cultural minorities, and what is the territorial behaviour of these populations (e.g., segregation, assimilation, or integration in respect of the wider community)?

Over the last few years environmental psychologists have made tentative steps towards building models of the conditions necessary for generating behaviour favourable to the global environment, as a function of both values and human well-being (Vlek, Skolnik & Gatersleben, 1998). How are inter-cultural differences, particularly with respect to values, compatible with pro-environmental benefits for future generations? Many studies point to individualistic behaviour in the face of limited resources (i.e., 'the tragedy of the commons': Hardin, 1968; Thompson and Stoutemyer, 1991) which can be interpreted in more familiar social psychological terms as a social dilemma problem (Van Lange, Van Vugt *et al*, 1998). Other studies focus on the different ways of envisaging our relationship with the

environment, such as 'the New Environmental Paradigm' (Arcury and Christianson, 1990; Dunlap, Van Liere *et al.*, 2000). Perception, attitudes, and behaviour concerning the environment differ from one culture to another to the extent that they are modulated by environmental variations, the resources available and the societal context including values, regulations, infrastructure, and opportunities for action (Lévy-Leboyer *et al.*, 1996). For instance, the different cultural representations of water form interpretative filters of the objective conditions and normative references orienting individual and collective behaviour (de Vanssay *et al.*, 1997). The resolution of the dilemma between individual short-term behaviour and collective action which is common in these types of problematic situations depends on cultural values, accessibility to resources, and the perception of these resources. The representation of water is shaped by the values attached to water: affective and aesthetic values lead to a dynamic, global ecological vision, whereas functional values and spatial and temporal proximity constitute a limited representation of the same phenomenon.

The Temporal Dimension

There has been a growing interest in recent years in the historicity of psychological processes (Gergen and Gergen, 1984). Too often in psychology time, like the environment, has been treated as noise rather than a valid process in itself. Even in areas such as social representations which have an integral temporal dimension, little account is given of either the origins or the development of the representations (Herzlich, 1973; Moscovici, 1976; Uzzell and Blud, 1993). There are clearly difficulties in accessing the past from a psychological point of view (Lowenthal, 1985; Uzzell, 1998). Social structures and social processes change over time, and this in turn has an effect on spatial structures and processes. If psychological processes are moulded and influenced by their social context, then changing social structures and regulatory mechanisms will affect those processes with a consequent effect on the individual, the group, and the environment. While environmental psychology often hints at the temporal dimension of people-environment relations with the physical and social environment, the temporal dimension has in general been neglected. (Altman & Rogoff, 1987; Proshansky, 1987, Werner, Altman & Brown, 1992).

First, the temporal dimension intervenes in different ways in terms of spatial anchoring and individual well-being. Anchoring is always a process which occurs within a time dimension. It reflects the individual's motivations, social status, family situation, and projects for the future. Well-being has to be set within a time reference, within a time horizon and the life cycle.

Second, the temporal dimension intervenes as a reference in the individual's construction of his or her own identity. Appropriating one's place of residence is conditioned by the individual's residential history. A sense of neighbourliness in the immediate environment can compensate for mediocre living conditions, but such compensation does not occur if the person looks back with nostalgia to his/her childhood residence (Lévy-Leboyer and Ratiu, 1993; Ratiu and Lévy-Leboyer, 1993). Furthermore, environmental appropriation revolves around forming social and interpersonal relationships which depend largely on the duration of the person's residence. Those who make emotional investments in their neighbourhood and develop a sense of well-being tend to be more satisfied with their interpersonal relations in their neighbourhood. This takes the form of relationships which go beyond simple politeness (Fleury-Bahi, 1997; 1998). On the other hand, the lack of free time available to people living in suburbs impacts upon residents' relationships with neighbours (Moser, 1997).

Third, how do inter-individual differences, and particularly gender differences, express themselves in relation to the temporal dimension in terms of spatial investment and environmental needs? How are these two variables interrelated? What is their impact on our perceptions, needs, and behaviour? The division of time between leisure and non-leisure activities (e.g., activities involving imposed time constraints and activities) is fundamentally different when we compare urban and non-urban settings. Commuting time, due to the greater distance between home and work, reduces the free time of commuters in large urban areas in a way which is obvious. This has not been systematically considered with respect to its impact on the appropriation of space. One might assume that people, who appropriate their environment and feel at home where they live, will also care more about the environment in general, and exhibit more frequent ecologically beneficial behaviours as predicted in the *Cities-Identity-Sustainability* model (Pol, Guardia *et al*, 2001, Uzzell, Pol *et al*, 2002).

The cognitive and affective evaluation of the environment is contingent upon on temporal, historical, and cultural factors. Analyses of the perception, evaluation, and representations of the environment, both built and natural, generally only make implicit reference to the cultural and temporal dimensions. It has been found, for example, that the cognitive image of the city of Paris develops and is conditioned not only by the culture of origin and the socio-spatial familiarity, but also goes through well-defined representational stages before becoming more or less stable (Ramadier and Moser, 1998).

Increasing population mobility also raises questions of concerning the rhythm of life and its consequential territorial implications. All places have a life rhythm. For some it may be short-lived – a period of high intensity use either by day, week or season. Many leisure settings fall into this category. Others may be '24/7 environments' such as shopping malls and airports which are open and used every hour of the day, every day of the year. What differentiates the rhythm are the different types of groups that occupy the spaces for different reasons at different times. We know from research on leisure and recreation that what makes a recreation place are the social meanings ascribed to the recreational setting rather than the particularities of the activities undertaken (Cheek, Field and Burdge, 1976). An integral component of this is time. With the development of new technologies, the notion of proximity takes on new meanings which have not been fully explored by environmental psychologists. Finally, the temporal dimension resurfaces in the context of the preservation of the environment and natural resources. One of the conditions for adopting pro-environmental behaviours is the ability to project oneself into the future and to step outside one's own life-cycle and act in the interests of future generations.

Both temporal and cultural dimensions have to be taken into account when addressing quality of life issues. Well-being depends on the satisfaction of culturally determined needs. Environmental anchoring and appropriation leading to identity are progressive processes and are essential for individual and group behaviour in respect of a sustainable development. The relationship to the environment (at every spatial level – home, neighbourhood, city, nation, planet) is mediated by the individual's and group's sense of control. Each individual has a personal history and representation of the past and an anticipatory representation of the future (Doise, 1976) which conditions how he or she relates to the environment. This means abandoning the atemporal orientation of environmental psychology to favour of a more dynamic approach. Analyses of pro-environmental behaviour have demonstrated the importance of a temporal horizon, yet few research studies explicitly incorporate this dimension. It is only by refocusing analysis on the person and the social group and their relation with the environment in its spatial, cultural, and temporal dimensions that the discipline will be able to develop its own meta-theories. It is in this context that the perspectives of sustainable development and the consequences of

globalisation can give a new impetus to environmental psychology and help to generate theories with wider applications.

Conclusion: Applying Environmental Psychology

Gärling and Hartig (2000) suggest that one of the shortcomings of environmental psychology is that environmental psychologists have only been able to provide general principles in response to the specific needs of practitioners. In short, it is suggested that there is an applications gap. While this may be a valid criticism of science in general, its validity in relation to environmental psychology should be challenged. If there is a gap, is it because environmental psychologists have failed to communicate with or convince other scientists and practitioners of the value of their work? Or is it because environmental psychologists have not delivered the kind of answers that practitioners such as architects and designers have required or were expecting or wanted? Perhaps environmental psychologists have been asking the wrong questions? Or does environmental psychology suffer from a shortage of data? Some might argue that what we need are better theoretical ways of understanding the data we have already. It may also be that those who have the task of drawing upon and implementing the results of environmental psychological and other behavioural science research become frustrated at the amount of time, financial resources and effort that go into generating marginal increases in the amount of variance explained in a set of data. Increasing the amount of variance explained from 33% - 35% is important, but we really need to be far more imaginative in our theoretical and conceptual approaches in order to make serious inroads into the 65% of the variance unaccounted for.

Gifford (2000) has argued that we need more challenging and bold theories. Environmental psychology has an important role to play in providing conceptual guidelines of how to look at and analyse a given setting with reference to its contextual framework. As we suggested at the outset, the essence of environmental psychology is the context. Context is all as it is an inseparable part of the explanation of people's transactions with the environment. One way of responding to Gifford's plea for bolder theories is to extend our understanding of context. In this last section we have argued that the cultural and temporal dimension of people-environment relations needs to be incorporated into our analytical framework. There is every reason to argue that this should be the new thrust in environmental psychology research because the study of globalisation and sustainable development - two crucial issues which we have identified in this chapter - with their implications for people-environment relations will necessitate the incorporation of cross-cultural and temporal analyses if we are to find solutions to the challenges they pose.

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