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# 1 Environmental psychology: History, scope and methods

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# 1.1 INTRODUCTION

This book aims to give an introduction in **environmental psychology**. We define environmental psychology as the discipline that studies the interplay between individuals and their built and natural environment. This means that environmental psychology examines the influence of the environment on human experiences, behaviour and well-being, as well as the influence of individuals on the environment, that is, factors influencing environmental behaviour, and ways to encourage pro-environmental behaviour. This book will give an overview of theories and research on each of these topics.

In this introductory chapter we first give a brief overview of the history of the field of environmental psychology, followed by a discussion of characteristics of the field and a description of the main methods used in research. The chapter ends with an outline and rationale of the book.

# 1.2 HISTORY OF THE FIELD

Environmentally psychologically has been recognised as a field of psychology since the late 1960s and is therefore a relatively ‘new’ field in psychology (Altman, 1975; Proshansky, Ittelson, & Rivlin, 1970; Stokols, 1977, 1978). Pol (2006) argues that Hellpach was one of the first scholars who introduced the term ‘environmental psychology’ in the first half of the 20th century. Hellpach (1911) studied the impact of different environmental stimuli, such as colour and form, the sun and the moon and extreme environments, on human activities. In his later work, he also studied urban phenomena, such as crowding and overstimulation, and distinguished different types of environments in his studies (e.g. natural, social and historical-cultural environments; see Pol, 2006). Although the topics of Hellpach are typical of the field of environmental psychology as it has been practised from the 1960s onwards, it was still too early to speak of an independent field of systematic research into human–environment interactions.

Brunswik (1903–1955) and Lewin (1890–1947) are generally regarded as the ‘founding fathers’ of environmental psychology (Gifford, 2007a). Neither of these scholars had significant empirical work that we would classify today as environmental psychology. However, their ideas, such as the interaction between physical environment and psychological processes and studying human behaviours in real-life settings instead of artificial environments, were influential for many later studies on human–environment interactions (see Box 1.1).

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## BOX 1.1 FOUNDING FATHERS OF ENVIRONMENTAL PSYCHOLOGY

Egon Brunswik (1903–1955) was one of the first psychologists who argued that psychology should give as much attention to the properties of the organism's environment as it does to the organism itself. He believed that the physical environment can affect psychological processes subconsciously. He also strongly advocated research that includes all aspects of the environment of the person being studied rather than the fragmented and artificial environments that were typically studied by psychologists in those days.

Kurt Lewin (1890–1947) similarly argued that research should be driven by real-world social problems. He introduced the term 'social action research' including a non-reductionist, problem-

focused approach that applies theories in practice and hereby emphasises the importance of discovering ways to use research to solve social problems (Benjamin, 2007). Moreover, like Brunswik, Lewin conceptualised the environment as a key determinant of behaviour. He argued that behaviour is a function of the person and the environment (Lewin, 1951). Lewin mostly focused on the social or interpersonal influences instead of the physical environment (Wohlwill, 1970), but he inspired different students to continue and expand on his ideas. These students included Barker and Bronfenbrenner, who are both seen as forerunners of environmental psychology.

### *Towards 'architectural' psychology*

Around the late 1940s and 1950s, systematic research in everyday physical settings and psychological processes slowly increased with some pioneering studies of, for example, human factors in work performance (Mayo, 1933), the lighting of homes (Chapman & Thomas, 1944) and child behaviours in natural settings (Barker & Wright, 1955). So it was not until the late 1950s and early 1960s that human behaviour interactions slowly received more and more recognition as a full discipline. As most of the studies focused on how different environments influenced people's perceptions and behaviours, they were labelled as studies in 'architectural psychology' to show the distinction with the more traditional forms of psychology (Canter, 1969; Pol, 2007; Winkel, Saegert, & Evans, 2009).

In this early period of the field of environmental psychology, much attention was given to the built physical environment (i.e. architecture, technology and engineering) and how it affected human behaviour and well-being (Bonnes & Bonaiuto, 2002). This focus on the built environment was largely guided by the political and social context of the time. Modern architecture tried to address the post-war challenges of providing decent housing and facilities for the general public (Pol, 2006). Questions such as how homes, offices or hospitals could best be built for their potential users and how environmental stressors (e.g. extreme temperatures, humidity, crowding) would affect human performance and well-being were the focus

of many environmental psychological studies (Craik, 1973; Wohlwill, 1970). Environmental psychology as a study to design buildings to facilitate behavioural functions was officially born.

### *Towards a green psychology*

The second period of rapid growth in environmental psychology started during the late 1960s when people became aware of environmental problems. This resulted in studies on environmental issues, that is, studies on explaining and changing negative influences of human activity on the biophysical environment, and on the negative effects of these human-caused problems (such as noise, pollution) on human health and well-being. The first studies in this area focused on air pollution (De Groot, 1967; Lindvall, 1970), urban noise (Griffiths & Langdon, 1968), and the appraisal of environmental quality (Appleyard & Craik, 1974; Craik & Zube, 1976). In the 1970s onwards the topics further widened with issues of energy supply and demand (Zube, Brush, & Fabos, 1975) and perceptions of risks and risk assessment associated with growing (energy) technologies (Fischhoff, Slovic, Lichtenstein, Read, & Combs, 1978). In the 1980s the first studies arrived that focused on efforts promoting conservation behaviour, such as relationships between consumer attitudes and behaviour (Cone & Hayes, 1980; Stern & Gardner, 1981).

## 1.3 CURRENT SCOPE AND CHARACTERISTICS OF THE FIELD

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At the beginning of the 21st century, it has become evident that environmental problems such as pollution, deforestation and climate change are increasingly affecting the world's ecosystems (Millennium Ecosystem Assessment, 2005). It is also generally recognised that human behaviour is one of the main causes of these environmental problems. A continuing and growing concern of environmental psychology is to find ways to change people's behaviour to reverse environmental problems, while at the same time preserving human well-being and quality of life. To this end, a broad concept of **sustainability**, which encompasses environmental as well as social and economic aspects, has been widely adopted (World Commission on Environment and Development, 1987). This broad concept of sustainability has increasingly become a central guiding and unifying principle for research in environmental psychology (Giuliani & Scopellitti, 2009). Indeed, it has been suggested that, over the past decades, the field of environmental psychology has gradually evolved into a 'psychology of sustainability' (Gifford, 2007b).

Below, we discuss four key features of environmental psychology that characterise the field as it stands today: a focus on human–environment interactions, an interdisciplinary approach, an applied focus, and the use of a diversity of methods.

## **Interactive approach**

As the definition of environmental psychology already indicates, environmental psychology is primarily interested in the interaction between humans and the built and natural environment, and explicitly considers how the environment influences behaviour as well as how behaviour results in changes in the environment. For example, environmental conditions such as the presence of nature in the environment of childhood may influence people's connectedness to nature and willingness to support nature conservation measures. In turn, people's support for nature conservation measures may influence environmental conditions such as biodiversity. As another example, the available infrastructure for public and private transport may influence the level of car use, while in turn the level of car use may influence the seriousness of environmental problems such as air pollution and global warming. So humans and the environment are related in a reciprocal, dynamic way.

The reciprocal relationship between humans and the environment served as a starting point for the structure of this book. Part I discusses the negative as well as positive influences of environmental conditions on humans, with a focus on environmental impacts on human health and well-being. Part II discusses the negative and positive influences of human behaviour on environmental conditions, with a focus on pro-environmental behaviour. Part III discusses how knowledge about human–environment interactions can be used to develop practical strategies to encourage pro-environmental behaviour and create sustainable environments.

## **Interdisciplinary collaboration**

Many environmental psychologists work in interdisciplinary settings, and closely collaborate with scholars from other disciplines. Each discipline provides a different view on the phenomenon under study, while in combination, they provide a comprehensive picture on the problem at stake. As outlined in the historical overview, interdisciplinary collaboration has mostly occurred in three domains. First, environmental psychology has always worked closely with the disciplines of architecture and geography to ensure a correct representation of the physical-spatial components of human–environment relationships (see Part I of this book). Second, theoretical and methodological development in environmental psychology has been influenced strongly by the psychological disciplines of social and cognitive psychology (see Part II). Third, when studying and encouraging pro-environmental behaviour (see Part III), environmental psychologists have collaborated with environmental scientists to correctly assess the environmental impact of different behaviours.

## **Problem-focused approach**

Environmental psychologists do not conduct studies merely out of scientific curiosity about some phenomenon, but also try to contribute toward solving real-life

problems. This does not mean that environmental psychologists are not interested in theories. As evidenced in this book, a great deal of attention is paid to building and testing theories in order to understand, explain and predict human–environment interactions. However, an important aim of theoretical development in environmental psychology lies in identifying the most effective solutions to real-life problems.

Environmental psychology studies human–environment interactions at different scale levels, from domestic surroundings and the neighbourhood to cities, nature reserves and countries, and even the planet as a whole. The problems and associated solutions that are studied vary across these levels. For example, at the local level, problems such as littering and solutions such as recycling may be a focus of research. At regional and national levels, problems such as species loss and solutions such as ecological restoration can be studied. At the global level, problems such as climate change and solutions such as the adoption of new technologies to combat climate change are of interest. Environmental psychology is concerned with problems at all scales, from local to global.

### *Diversity of methods*

Environmental psychology largely uses the same **quantitative** and **qualitative methods** as other psychological disciplines. However, whereas other psychological disciplines often have one dominant research paradigm, environmental psychology is characterised by the use of a wide diversity of methods (see Section 1.4 for an overview). Each research method has its strengths and weaknesses (see also Table 1.1). Choosing a method often involves a trade-off between **internal** and **external validity**. Low external validity of a finding may be problematic if the goal is designing an intervention to solve a specific applied problem. However, it may be less relevant if the purpose of the research is testing theory because in this case the main concern is to achieve a high internal validity. Ideally, environmental psychologists try to replicate findings on the same phenomenon using different research methods. In this way, weaknesses of one research method may be compensated by the strengths of another.

## 1.4 MAIN RESEARCH METHODS IN ENVIRONMENTAL PSYCHOLOGY

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The main research methods used in environmental research include questionnaire studies, laboratory experiments, simulation studies, field studies and case studies. Below we briefly discuss each of these methods. We first discuss methods that can be used independent of specific environmental settings, followed by methods employed in artificial settings. Finally, we discuss methods that are employed in real

**Table 1.1** Summary of main research methods in environmental psychology.

<b>Setting</b>	<b>Method</b>	<b>Strengths</b>	<b>Weaknesses</b>	<b>Use</b>
Environment-independent setting	Questionnaire studies	High external validity Cost-effective method for reaching large populations	No manipulation of variables No causal inferences	Describing populations or practices Studying relationships among variables
Artificial setting	Laboratory experiments	High internal validity Control of variables	Low external validity Artificiality	Testing theories or hypotheses Identifying causal relationships
	Simulation studies	Good balance between external/internal validity Realistic visualisation	Requires advanced skills and equipment Often perceived as 'fictitious'	Study complex human–environment dynamics Visualise and evaluate future developments
Real setting	Case studies	High external validity Rich data	Low internal validity Time demanding Limited generalisability	Descriptions Explorations Developing hypotheses
	Field studies	Good balance between external/internal validity Replicable	Limited experimental control Difficult data collection	Studying current practice Evaluating interventions

settings. The main strengths and weaknesses of each method are summarised in Table 1.1.

### Questionnaire studies

Questionnaire studies aim to describe behaviours and to gather people's perceptions, opinions, attitudes and beliefs about different issues. They are also widely used to establish relationships between two or more variables. For example, by asking people how often they engage in littering and how satisfied they are with the amount of garbage bins in their neighbourhood a relationship can be established between both variables. However, it cannot be excluded that a third variable (i.e. confound) has caused the relationship. For example, an area with many garbage bins may be inhabited by a particular group of residents (e.g. highly educated individuals) who may systematically differ from groups that inhabit areas with few garbage bins. Also, the direction of the relationship is not clear: does the municipality decide to place bins



because residents tend to litter a lot in certain areas or do residents litter because there are no bins available? Because of this, causality cannot be established which consequently results in a low internal validity.

Questionnaire studies are popular in environmental psychology for several reasons. First, manipulation of environmental conditions and random assignment of participants to these conditions (as in experimental research) is often unethical or impossible. For example, when studying the effects of transport pricing on car use, it is impossible to double fuel prices in one area, but not in another comparable area. Furthermore, external validity of questionnaire studies tends to be high, which is often regarded as crucial in studies on environmental issues. Finally, questionnaire studies are relatively easy to apply at low cost.

### **Laboratory experiments**

Laboratory experiments are characterised by taking place in a controlled, mostly artificial, environment created for the purpose of the research. Laboratory experiments enable the establishment of causal relationships between variables, because of two basic features of experiments: manipulation and random assignment. Imagine that a researcher would like to examine whether variable X (independent variable, e.g. presence versus absence of garbage bins) influences variable Y (dependent variable, e.g. littering). When only the independent variable is manipulated and all other variables are kept the same, it can be concluded with reasonably certainty that any differences in responses between conditions are due to the manipulation. That is, in the example, if there is a difference in the amount people litter in laboratory settings that are identical except for the absence or presence of a garbage bin, one of the causes for littering (i.e. the presence of bins) has been identified. This possibility to draw causal inferences is referred to as internal validity.

Randomisation implies that all participants in the experiment have an equal chance of being assigned to each experimental condition. Randomisation minimises the chance that differences between experimental groups are caused by confounding individual factors such as differences in socio-demographics or personality types. For example, if only male participants are assigned to the garbage bin condition and only females to the condition without the garbage bin, then differences between the conditions may be caused by gender rather than the presence or absence of a bin.

The strong control in experimental settings generally creates artificial situations. Therefore, true experiments are often low in external validity, that is, the result may not easily be generalised to what typically happens in the real world.

### **Computer simulation studies**

Sometimes it is impossible to conduct research with real individuals or realistic environmental stimuli. Examples are studies that aim to learn about complex systems that involve thousands of people or studies on how people evaluate future environmental scenarios. Environmental psychologists are increasingly using environmental simulations for this reason. In this type of research, aspects of environments and/or

humans are simulated as accurately and realistically as possible. Simulations may include immersive virtual environments, created with computers, that give the participant a realistic impression of how it would be like to experience particular environments or events (e.g. De Kort, IJsselsteijn, Kooijman, & Schuurmans, 2003, see also Chapter 23), 3D visualisation of data in geographical information systems (see Chapter 4), or agent-based models of land use or resource use (see Chapter 26). In general, simulations make it possible to keep some control over the environment, thereby increasing internal validity, while external validity is not compromised too much.

## **Field studies**

In order to achieve high external validity without compromising too much on internal validity, many environmental psychologists use field studies. As field studies are conducted in real-life settings, they are relatively high in external validity. Yet, internal validity is relatively high as well, as the experimenter tries to take control over the situation by systematically manipulating independent variables (e.g. placing or removing a bin next to a park bench), and by trying to randomly assign participants to different study conditions (e.g. benches with and without bins). By doing so, researchers can be reasonably sure that any differences between conditions are due to the manipulations (and not to, e.g. individual differences), securing internal validity. Nevertheless, because field studies take place in real settings, it is difficult to control for possible confounding variables, such as changing weather conditions or unexpected interruptions. Furthermore, in many situations, random assignment is not possible.

## **Case studies**

Within psychology a case study refers to the in-depth study of a particular situation rather than a general statistical analysis. It is a method used to narrow down a very broad topic of research into one single case, i.e. a person, setting, situation or event. For example, the broad topic of urban environmental quality may be studied in one particular neighbourhood where the municipality has recently installed garbage bins to combat littering. Rather than employing a strict protocol and close-ended questions to study a limited number of variables, case study methods involve an exploratory, qualitative examination of a single situation or event: a case. Qualitative research uses words or other non-numerical indicators (such as images or drawings) as data. The main purpose of case studies and other types of qualitative research is to explore and understand the meaning that individuals or groups ascribe to a social or human phenomenon. In a case study, people or events are studied in their own context, within naturally occurring settings, such as the home, play fields, the university and the street. These settings are 'open systems' where conditions are continuously affected by interactions with the social, physical, historical and cultural context to

give rise to a process of ongoing change. Therefore, there will never be one objective truth of the interpretation of the phenomenon (Willig, 2001).

Many different strategies can be used in case studies. Examples of strategies include ethnography, grounded theory and phenomenology (see Wolcott, 2001, for more information). Although qualitative research methods such as case studies are gaining in importance in academic journals, quantitative research methods (those that use numbers rather than words as data) still dominate in environmental psychology. This is evidenced in this book, which relies almost exclusively on quantitative research.

## 1.5 OVERVIEW OF THE BOOK

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This book aims to introduce students, professionals and the general audience to key topics in contemporary environmental psychology. The book comprises three parts. After this general introduction, the first part, comprising Chapters 2 to 12, provides an overview of research on the positive and negative influences of environmental conditions on experiences, well-being and behaviour, as well as ways to promote well-being via environmental changes. Key topics include risk perception, environmental stressors, nature experience, health effects of nature, architecture, urban environmental quality, quality-of-life effects of environmental conditions and effects of contextual cues on behaviour.

The second part, comprising Chapters 13 to 20, focuses on understanding environmental behaviour. Various ways to measure environmental behaviour and factors influencing this behaviour, such as values and norms, are discussed. Different theories to explain environmental behaviour are presented, including norm theory, value theory, theories on affect, social dilemma theory, the theory of planned behaviour, the norm activation theory and habit theory. Also, a Latin American perspective on studying interactions between humans and the environment is provided.

The third part of the book, comprising Chapters 21 to 27, discusses ways to encourage pro-environmental behaviour and well-being via informational strategies, changing the incentives and technological innovations. It also discusses factors influencing the acceptability of policies, processes of change and social simulation of behaviour changes. Besides, special attention is paid to encouraging pro-environmental actions in developing countries.

In the final chapter of this book, we draw some general conclusions, identify trends and suggest viable avenues for future research.

## GLOSSARY

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**environmental psychology** A subfield of psychology that studies the interplay between individuals and the built and natural environment.

**external validity** The extent to which the results of a study can be generalised (applied) to other populations (population validity) or settings (ecological validity). External validity is also known as generalisability.

**internal validity** The extent to which it can be concluded that an observed effect is caused by an independent variable.

**qualitative methods** Methods of analysis that use data in the form of words or other non-numerical indicators (e.g. images, drawings).

**quantitative methods** Methods of analysis that use data in the form of numbers.

**sustainability** Using, developing and protecting resources at a rate and in a manner that enables people to meet their current needs and also ensures that future generations can meet their own needs; achieving an optimal balance between environmental, social, and economic qualities.

## SUGGESTIONS FOR FURTHER READING

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## REVIEW QUESTIONS

1. What is environmental psychology? Give a short definition.
2. Describe the four key features of environmental psychology.
3. Which concept has increasingly become a guiding and unifying principle for research in environmental psychology? Define this concept.
4. Give three examples of problems studied by environmental psychologists.
5. Why do environmental psychologists use a diversity of research methods?

