8 Social psychology and environmental problems

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Introduction

Behaviour always occurs in the context of a physical environment. In many cases, the physical environment is crucially important to our thoughts, feelings, performance, behaviour and well-being. For example, many people feel uncomfortable in the heat, and are more easily annoyed by others when temperatures are high. Traffic noise may result in stress and cardiovascular diseases. Suburbanization causes people to commute for longer distances. The availability of recycling facilities increases recycling rates. Job satisfaction is higher if employees work in offices with windows that open rather than with windows that do not open. The presence of nature seems to improve health and well-being. Human activities also have an impact on the environment. For example, the use of fossil fuels produces carbon dioxide (CO_2) emissions, urbanization reduces farmland and natural landscapes and some species of animals become extinct by human activity. In fact, almost everyone lives in the built environment and many people never encounter an environment that has not been made or modified by human activity.

Environmental psychologists study such interactions between humans and their physical environments. Traditionally, environmental psychologists focused on how the physical environment (e.g., buildings, noise, pollution and the weather) affects us. More recently, much research is directed at the opposite relationship: how we affect the environment, for example, through our energy use, water use, vehicle use and land use. These two research directions are closely connected: individuals continuously change the environment, and, in turn, their cognitions, feelings, behaviour and well-being are changed by the environment. Our behaviour may affect environmental conditions that are crucial for our well-being. For example, car use increases local air pollution, which can result in health problems.

Why is the relationship between humans and their environment of concern to social psychologists? The reason is that many of the topics studied by environmental psychologists have social psychological aspects. For example, in order to be able to design human-friendly buildings, we need to know how people perceive and value various construction designs, and how they interact and perform in different physical settings. Similarly, to promote pro-environmental behaviour, we

need to know which factors influence various types of environmental behaviour, and to develop and evaluate policies that successfully promote pro-environmental behaviour. Not surprisingly, various social-psychological theories, research methods and intervention techniques have been applied to the understanding and improvement of the relationship between humans and the environment.

This chapter offers a brief overview of how social psychology can be applied towards better understanding and management of human–environment relationships. The first part is devoted to the effects of the environment on cognition, feelings, performance, behaviour and well-being. In the second part, the consequences of human actions for environmental quality are discussed. To improve environmental quality through changes in human behaviour, two lines of research are of particular importance. First, we need to understand which factors cause the behaviour that affects environmental quality, because policies designed to promote pro-environmental behaviour will be more effective when they target important antecedents of behaviour. Second, we need to investigate the effectiveness of different policies in promoting pro-environmental behaviour, and to investigate which types of interventions will be most effective in various situations. This chapter discusses both approaches.

Environmental influences on well-being and behaviour

If you consider how the environment affects our well-being and behaviour, you will probably think of negative as well as positive influences. For example, you feel comfortable when the temperature in your room is about twenty degrees Celsius, and your work performance will improve if the work environment is properly illuminated. On the other hand, poor building design, noise, water pollution and toxic substances, to name just a few, all threaten health and well-being, performance and behaviour. For example, you wander around lost in a large building when no clear cues are given on how to find your way, and you are less inclined to move to a polluted area. The extent to which these environmental stressors affect us depends in part on social-psychological factors. For example, simple correlations between objective levels of noise and noise annoyance are generally small. The relationship between noise level and annoyance is moderated by social-psychological factors (Figure 8.1). For example, individuals tend to be less annoyed by noise when they have a positive attitude towards the source of the noise, or, people who have control over a source of noise are much less annoyed than those who do not control it, and people who believe the noise has an important purpose are less annoyed than those who do not. Thus, not only objective exposure to particular stressors, such as noise, or air pollution for that matter, should be considered, but also other factors influencing subjective annoyance.

That social-psychological factors affect annoyance levels has important policy implications. It means that annoyance from environmental stressors cannot

Figure 8.1 *The level of noise annoyance depends on social-psychological factors*

be reduced merely by lowering levels of objective exposure. We must also target relevant social-psychological factors that moderate the effect of stressors on annoyance. For example, noise annoyance from airports may be reduced if the neighbouring residents are consulted by planners and can be convinced that the noise is important, say, for the economics of the region.

Some environmental psychologists focus on solving problems with the built environment and have, through their advice to architects and designers, contributed to better adaptation of buildings to human needs. Environmental psychologists have been involved in the planning stages of construction, as well as in the formal design, and have a special role in evaluating completed buildings, to determine whether the goals envisioned in the planning and design stages were fulfilled in the completed building (e.g., Zeisel, 2006; see Box 8.1). One of the pioneers of **social design** is Robert Sommer (1972; 1974; 1983). Social design benefits the people who live or work in a building, or even visit it, by systematically incorporating their needs and ideas into the design of a building.

Box 8.1   Applying research methods: social design saves pain and improves moods in hospitals

The social designer's job is to advocate as many design considerations that benefit people who use a building as possible. A large hospital construction project can serve as one example of the way social design can help people – or, without it, harm them (Carpman, Grant & Simmons, 1986). Architects were asked to design a hospital courtyard. The architects planned to surface parts of the courtyard with brick. Brick is attractive and other hospitals had used it. But interviews by the social design team revealed that patients with recent injuries or surgery found it painful to be wheeled over brick surfaces, which are often bumpy. The aesthetics-minded architects had not thought of this. However, thanks to the social designers, portions of the courtyard over which wheelchairs were expected to pass were redesigned with a smoother surface.

In a second example, environmental psychologists acting as social designers were involved in the renovation of a hospital wing; they helped hospital users of all types (patients, staff and visitors) participate in the renovation decision making (Becker & Poe, 1980). The changes made to the building represented those agreed upon through a consensus-seeking process, although financial and administrative constraints restricted the changes slightly. Next, the effects of the changes were measured, using three methods (questionnaires asking about the organizational climate, questionnaires evaluating the changed physical environment, and behaviour mapping, in which the movements of people around a space are tracked and coded). The renovated hospital wing was compared with two similar but unchanged wings. The mood and morale of the hospital staff on the renovated wing increased dramatically after the design changes, in comparison with those on the unchanged wings. All the user groups rated the changed features of the renovated wing as better than comparable features of the unchanged wings, and conversation and social interaction increased in the renovated wing, but was essentially unchanged in the control wings.

This study's research method is called a quasi-experimental design (see Chapter 4): the experimental condition (the renovated wing) was systematically compared with a control condition (the unchanged wings). It would have been a true experimental design if the participants had been randomly assigned to the three wings, but often in everyday settings social scientists are unable randomly to assign participants to different conditions. On the other hand, people in similar settings (for example, the three hospital wings) probably are often not very different from each other, as groups, so the study qualifies as a quasi-experimental design, a study that uses 'presumably' randomized assignment to conditions.

Effects of behaviour on the environment

Environmental problems and human behaviour

Not only are our well-being and behaviour affected by the environment but human behaviour affects environmental quality as well. Environmental quality is seriously threatened all over the world. Some of the most important environmental problems are urban air pollution, noise annoyance, shortages in freshwater availability, over-fishing of the seas, loss of biodiversity and global warming (see, e.g., UNEP, 2002). Global warming refers to climate change, and, more specifically, to an increase in the earth's average temperature, caused in part by the emission of greenhouse gases, most of which can be attributed to the combustion of fossil fuels (EPA, 2004). In the twentieth century, global average temperature has increased by $0.7° \pm 0.2°C$, and in Europe by more than $0.95°C$ (EEA, 2007). The International Energy Outlook 2006 (EIA, 2006) foresees a rise of global energy consumption by 71 per cent between 2003 and 2030, and average US temperatures could rise another $3°$ to $9°C$ by the end of the century if global warming emissions are not reduced. The global average temperature is projected to increase by $1.4°$ to $5.8°C$ and by $2°$ to $6.3°C$ in Europe from 1990 to 2100 (EEA, 2007).

This will have far-reaching effects. Sea levels are expected to rise and flood coastal areas. Heat waves will be more frequent and more intense. Droughts and wildfires are likely to occur more often. Disease-carrying mosquitoes may expand their range. Ecosystems and food production will be disrupted, and some species may be pushed to extinction.

Despite various policy initiatives (such as energy conservation programmes or international agreements like the Kyoto Protocol), greenhouse gas emissions have steadily increased by about 1 per cent per year during the last decade, and are expected to continue rising in the next decades because consumption of fossil fuels like oil, natural gas and coal is still increasing (EIA, 2006; EPA, 2004; see Figure 8.2). Households significantly contribute to greenhouse gas emissions, by using electricity, natural gas and other fuels, and by the consumption of goods and services that require energy to produce. The latter is referred to as indirect energy use, that is, the energy needed to produce, transport and dispose of goods. Total residential electricity use in the OECD region is expected to increase by an average of 1.4 per cent per year from 2003 to 2020. In non-OECD countries, household electricity use is expected to grow even more, by 2.7 per cent per year on average between 2003 and 2030. This growth is mostly driven by economic growth and expanding populations in those countries.

Many environmental problems are rooted in human behaviour. For example, car use contributes to global warming (CO_2 emissions), the fragmentation of natural areas (caused by the construction of roads), noise annoyance and urban air pollution. By using water for cleaning, bathing, watering lawns, etc., the availability

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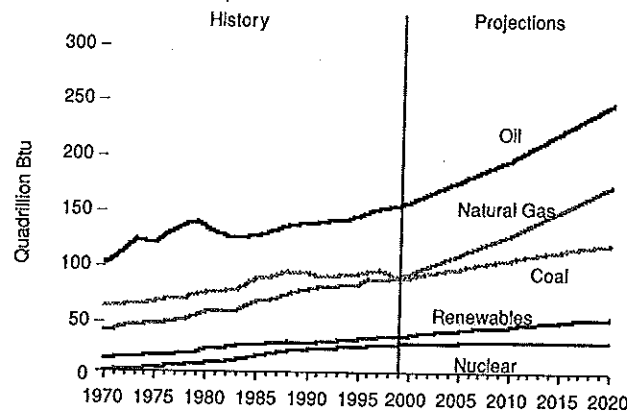
Source: EIA, International Energy Outlook 2001

Figure 8.2 *World energy consumption by fuel type, 1970–2020* (EIA, International Energy Outlook 2001)

of fresh water may be threatened, especially in arid regions. Through the consumption of fish or bushmeat, some species may become extinct. Consequently, environmental problems can be reduced through changes in human behaviour, and social psychologists can play an important role in this respect. Scientists realize that behaviour changes are badly needed because physical or technical measures (e.g., energy-efficient appliances) are not sufficient to resolve environmental problems. Efficiency gains tend to be partly overtaken by growth in consumption levels.

In order to design effective interventions aimed to reduce environmental problems through behavioural changes, we need to know (1) which behaviour significantly contributes to environmental problems, (2) which factors cause such behaviour and (3) which policy interventions are likely to promote pro-environmental behaviour. On the first point, social psychologists cooperate with environmental scientists to determine the environmental impacts of various behaviours. We return to this issue in the section 'Applied social psychology in context'. The second and third issues are of central interest to social psychologists. Below, we first elaborate on the second point: Which factors influence environmental behaviour? Then we elaborate on the third point: Which interventions successfully promote pro-environmental behaviour?

Understanding environmental behaviour

Environmental behaviour can be defined as behaviour that changes the availability of materials or energy from the environment or alters the structure and

dynamics of ecosystems or the biosphere (Stern, 2000), and as such, influences human well-being, welfare and other things people value. Some argue that the environment should be valued for its own sake, regardless of its value for human beings. This rather broad definition implies that almost all human behaviour can be considered to be environmental behaviour. Individuals need not be aware of, or consider, environmental impacts of specific behaviours when making decisions. In fact, in many cases people do not know much about the environmental impact of their behaviour (Baird & Brier, 1981). Obviously, the extent to which behaviour affects the environment differs greatly. Driving a car has many more negative consequences than accepting a plastic bag in a grocery store. Ideally, social psychologists should focus their efforts on behaviour that most significantly affects environmental quality.

One might think that most or all social-psychological theories aimed at explaining behaviour would be useful in the environmental context. In principle, this is true. However, some theories are more useful than others. Pro-environmental behaviour is often associated with higher personal costs (more time, money or effort). For example, for many people, travelling by public transport is less convenient and attractive than driving a car. Organically grown food is more expensive, and recycling takes effort. Hence, theories that examine why people sacrifice personal gains in favour of the common good are especially promising in the environmental context. So, *under which conditions* are people willing to sacrifice individual advantages to protect the environment? In this section we briefly introduce three theoretical approaches that explicitly deal with this question: commons dilemmas, the norm activation model and theories on values and environmental concern. These theories have been often applied to explain environmental behaviour. Next, we elaborate on the role of habits. In many cases, individuals do not make conscious decisions. Especially in case of everyday behaviour (e.g., driving to work, cleaning the house, heating the house, buying groceries), habits are formed. We will briefly discuss how habits are formed, and why habits can inhibit behaviour change.

Commons dilemmas

Many environmental problems, such as resource depletion, global warming and pollution can be understood as **commons dilemmas**, situations that involve conflict between individual and collective interests. One example is urban air pollution resulting from accumulation of exhaust fumes from individual cars. In the short term, each individual may be better off driving a car than taking the bus, because the car is a much more comfortable, flexible and pleasurable vehicle. However, if everyone drives cars, urban air pollution will increase. In the long term, society would be better off if everyone reduced his or her car usage. Individuals do not need to be aware of the conflict between their individual and collective interests, for example, because they do not acknowledge or value the collective problems associated with their behaviour. Consequently, a distinction can be made between

the perspective on environmental problems of an actor (consumer) and an observer (scientist or expert).

Typically, in large-scale commons dilemmas, individual contributions to collective problems and their solutions are futile. If one person reduces his or her car use while others do not, pollution is not reduced. The problems of car use will only be reduced when many other people do the same. Lack of trust in others' cooperation tempts individuals to act in their short-term self-interest, that is, to keep on driving. People are tempted to 'free ride', i.e., when they think that others will reduce their car use, they may decide to keep on driving, thereby continuing to enjoy the advantages of driving while pollution decreases. Thus, in the short term, the rewards for not engaging in pro-environmental behaviour often are greater than the rewards for engaging in it, no matter what others do. However, when most people act in their own interest, environmental problems will increase, which may harm present as well as future generations.

Commons dilemmas involve many people. In pursuing their own personal interests, many individuals tend to shift the relatively small negative impact of their behaviour onto their common environment. For example, almost every citizen in the developed world contributes to global warming, air pollution or resource depletion. However, individual contributions to environmental problems and their solutions are limited. Environmental problems will not be solved merely because one person stops driving, or lowers his or her thermostat settings in the home. They will be solved only if many other people do so as well. Because each individual's unhelpful choices have little impact, they seem to be excusable.

Fortunately, individuals do not always act in their own interest. Some use their car as little as possible or try to reduce their energy use, even though this might be less comfortable. Why do people engage in environmental behaviour when it has no direct benefits for them, at least not in the short term? In contrast to what is generally assumed in classical economics, people do not always choose the option with highest benefits against lowest costs (i.e., in terms of money, time or social approval). People also tend to consider what is the right thing to do, which means that they also consider moral costs and benefits. In other words, decisions are not just always made by cost-benefit analysis, but can be steered by morality as well. Traditional economic theory or cost-benefit models are less suitable to explain moral behaviour, because they do not consider moral costs and benefits. As a consequence, we need models that include morality in order to explain why some people give up personal benefits to safeguard environmental quality. A good example of such a model is the *norm activation model* (NAM) (Schwartz, 1977; Schwartz & Howard, 1981).

Norm activation model

The NAM was originally developed to explain pro-social behaviour, and has often been applied to explain environmental behaviour (which can be considered as a specific type of pro-social behaviour). According to this model, behaviour occurs in response to personal norms, that is, feelings of moral obligation. Personal norms

are activated when individuals are aware of adverse consequences of their actions to others or the environment (awareness of consequences, or AC beliefs) and when they believe that they can reverse these consequences (ascription of responsibility, or AR beliefs). Imagine that you want to buy a new household cleaner. You can choose between a very cheap cleaner that contains dangerous solvents, or a cleaner that costs 50 per cent more, but does not contain any solvents. Which product would you purchase? According to the NAM, you will be more likely to choose the solvent-free cleaner if you are aware of the environmental problems caused by solvents (high AC), and when you think you could help reduce these problems by not buying products that contain solvents (high AR). When both AC and AR are high, you will feel a strong moral obligation to buy the solvent-free cleaner, and you will be more likely to actually choose this product. However, if you are not aware of the negative environmental effects of solvents, or do not see any opportunity to help reduce these harmful impacts, you will probably not feel a moral obligation to buy the solvent-free cleaner, and, consequently, will be more likely to purchase the cheaper product with solvent.

The NAM appears to be more successful in explaining environmental behaviour associated with relatively low behavioural costs (in terms of money, time or effort), such as recycling. It often has less explanatory power when the behaviour in question is more costly in terms of effort, money or time, such as reducing car use. Apparently, personal norms for acting in the common good are pushed into the background in favour of egoistic concerns when behavioural costs are high.

How can individuals deal with a decisional conflict between acting in the collective interest (following personal norms) and acting in their own interest (by choosing behavioural options with high individual benefits)? Such a decisional conflict can be reduced via **self-serving denial**, that is, denial of a moral obligation to act pro-environmentally in order to justify a choice to act in an environmentally unfriendly manner. Four types of self-serving denial may be distinguished. First, people may disregard, distort, or minimize environmental problems. Because the severity of some environmental problems is unclear and uncertain, and sometimes debated by scientists, people can selectively use scientific findings that support their position and behaviour. Second, people sometimes discount their liability for these problems, by believing that their own contribution to problems is small or undetectable, and by viewing environmental problems as the result of collective rather than individual decisions and actions. They may identify other parties, such as authorities or industry, as being responsible for environmental problems (Figure 8.3). Third, they can deny their personal ability or competence to perform the necessary pro-environmental actions. For example, they may indicate that they are willing to reduce their car use, but have no opportunities to do so because no public transport is available. Fourth, they can argue that their individual pro-environmental actions would not be effective in reducing environmental problems. This defence mechanism may be quite effective, especially in the case of large-scale environmental problems (such as commons dilemmas) where individual contributions to environmental problems do seem trivial.

Figure 8.3 *Self-serving denial*

From this, we can conclude that personal norms about the environment may play an important role when people make low-cost decisions, but are much less influential in the case of high-cost decisions. In the latter case, people are very creative at providing reasons why they ignore environmental concerns. Obviously, people do not only act out of environmental concerns. Other concerns, such as a desire for convenience, comfort, enjoyment, status or safety often play an important role in human decision making. In many cases, these concerns conflict with environmental concerns, making pro-environmental behaviour less likely.

The NAM was later extended to the *value-belief-norm theory of environmentalism* (VBN) (Stern, 2000; see Figure 8.4). The VBN model explicitly aims to explain behaviour resulting from pro-environmental intent. Like the NAM, VBN theory proposes that behaviour occurs in response to personal norms, and that personal norms are influenced by AR (ascription of responsibility) and AC (awareness of consequences), respectively. In addition, the VBN theory proposes that AC beliefs are rooted in general beliefs about human–environment relationships and on relatively stable value orientations. These concepts will be further elaborated below.

Values and environmental concern

Public concern for environmental issues is currently quite strong in many countries in the world. An opinion poll in 30 countries revealed that, across all countries, about 90 per cent say that 'climate change or global warming, due to the greenhouse effect' is a serious problem (World Public Opinion, 2006). One of the most influential measures of the extent to which people are concerned with the
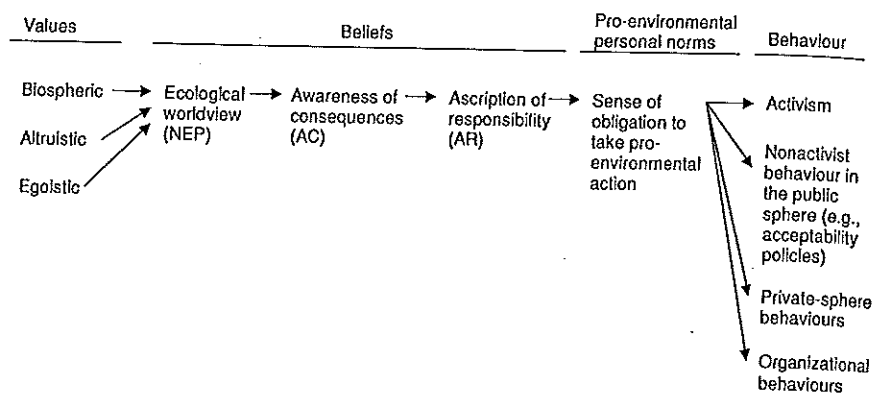
Values	Beliefs			Pro-environmental personal norms	Behaviour
Biospheric →	Ecological → worldview (NEP)	Awareness of → consequences (AC)	Ascription of → responsibility (AR)	Sense of obligation to take pro-environmental action	Activism
Altruistic ↗					Nonactivist behaviour in the public sphere (e.g., acceptability policies)
Egoistic ↗					Private-sphere behaviours
					Organizational behaviours

Figure 8.4 *A schematic representation of the VBN theory of environmentalism (adapted from Stern, 2000)*

environment is called the **new environmental paradigm (NEP)**. The NEP measures a person's fundamental beliefs about the relations between humans and the environment. Those who strongly endorse the NEP believe that there are limits to growth, that people cannot dominate and control the environment and that the balance of nature is easily upset by human actions (Dunlap, Van Liere, Mertig & Jones, 2000). Numerous studies have found significant relations between the NEP and behaviour-specific beliefs and norms, intentions and behaviour (which is also true of VBN theory). For example, NEP beliefs are positively related to concern about global warming, personal and social norms towards recycling, support for environmental policies, acceptability of energy-saving measures, willingness to pay for environmental protection, and buying environmentally friendly products. However, these relations generally are not very strong. As is true of personal norms, NEP support is particularly related to low-cost behaviour.

Values also can affect environmental behaviour. Schwartz (1992, p. 21) defines a value as 'a desirable transsituational goal varying in importance, which serves as a guiding principle in the life of a person or other social entity'. Values are concerned with important aspects of life, such as health, freedom and justice, and have four key features. First, a value is a belief about the desirability of a certain end-state, such as a good health. Second, values are abstract and therefore transcend specific situations. As such, they may affect a variety of behaviours at once. Third, values serve as guiding principles for the selection or evaluation of behaviour, people and events. Fourth, values are ordered in a system of priorities. This implies that when competing values are activated in a particular situation, choices are based on a person's most important values.

In the environmental literature, three general value orientations are usually distinguished (see, e.g., Stern, Dietz & Kalof, 1993). One is the **egoistic value orientation**, in which people try to maximize their own outcomes, that is, they particularly consider individual costs and benefits when making choices. This value

orientation reflects values like power, material wealth and ambition. Another is the **altruistic value orientation**, which reflects concern for the welfare of other human beings. Related values include equality, social justice and helpfulness. Third, the **biospheric (or ecocentric) value orientation** reflects concern with non-human species and the biosphere. Related values include respecting the earth, preventing pollution and unity with nature. Research shows that people who strongly value concerns beyond their own interests, that is, altruistic or biospheric values, are more likely to engage in pro-environmental behaviour, whereas people who strongly endorse egoistic values are less likely to do so. Thus, people who endorse altruistic values and people who endorse biospheric values are both likely to act pro-environmentally, probably because both types of values reflect concern for others. However, when altruistic and biospheric values conflict (i.e., when acting pro-environmentally harms altruistic concerns), those who endorse altruistic values may be less likely to engage in pro-environmental behaviour than those who endorse biospheric values. This was illustrated in a study that examined to what extent values predict intention to donate to humanitarian or environmental organizations (De Groot & Steg, 2008). In this study, respondents first evaluated the relative importance of five egoistic values (social power, wealth, authority, influence and ambition), four altruistic values (equality, a world at peace, social justice, and helpfulness), and four biospheric values (respecting the earth, unity with nature, protecting the environment, preventing pollution) as 'a guiding principle in their life'. Next, respondents indicated whether they were more likely to donate money to a humanitarian or an environmental organization. They were presented with five pairs of organizations (e.g., UNICEF, a humanitarian organization, and Greenpeace, an environmental organization), including a short description of the mission of each organization. Organizations in each pair were comparable in their degree of (inter)nationalization of aid, publicity and aim. It appeared that respondents were more likely to donate to humanitarian organizations (and less to environmental organizations), the more they were altruistically oriented. In contrast, the more respondents valued the biosphere and environment, the less they intended to donate to humanitarian organizations and the more they preferred to donate to environmental movements. Egoistic values were not related to intention to donate. These results suggest that those endorsing altruistic values are less likely to act pro-environmentally when the particular behaviour conflicts with altruistic values.

Habits

The theories discussed earlier (i.e., the NAM, value theory and NEP) all assume that individuals think before they act. However, we often do not. Imagine getting up in the morning. Do you make reasoned choices about what to do first, and what to do next? What to eat for breakfast? How to travel to work or school? Most likely you do not. You simply do what you are used to doing. We cannot think through every choice we might make. In many cases, habits are formed to simplify our lives. Everyday behaviours in particular turn into daily routines.

That being said, frequently performed behaviour is not always a matter of habit. We may often deliberate about how to act, even though we have enacted the behaviour time and again. Thus, the frequency of engaging in behaviour is not a good indicator of a habit. Rather, habits refer to the way decisions are made. Habits have three important characteristics (Aarts, Verplanken & Van Knippenberg, 1998). First, they are activated in the presence of a specific goal. After all, people do not automatically take the bicycle to ride to the gym without having a goal to go there. Second, the same course of action will be repeated when outcomes are satisfactory. The more positive the outcomes of the action and the stronger the association between the goal (e.g., going to the gym) and the action performed to reach that goal (e.g., taking the bicycle) becomes, the stronger the habit strength. Third, habitual responses are mediated by cognitive processes. Although habits are automated behaviour, cognitions do play a role in the process. When people frequently act in the same way in a particular situation, the mental representation of that situation will be associated with the representation of the particular goal-directed behaviour. For example, if a person frequently cycles to the gym, he or she will associate going to the gym (the mental representation of the particular situation) with cycling (viz., the goal-directed behaviour). The more frequently a particular situation (going to the gym) is associated with a particular behaviour (cycling), the stronger the strength and accessibility of that association, and the more likely that an individual acts accordingly. This implies that habitual behaviour is triggered by a cognitive structure that is learned, stored in and retrieved from memory when we perceive particular stimuli.

Based on this, Aarts and colleagues conceive of habits as goal-directed automated behaviours that are mentally represented. They developed a response-frequency measure of habit strength that assumes goals are capable of automatically activating mental representations of habitual choices. When employing this measure for the strength of a car-use habit, respondents are presented with a set of different travel goals that widely vary in distance and destination, such as visiting the city centre, going to work or visiting a friend in a nearby town. They are asked to mention as quickly as possible the mode of transport that first comes to mind as the one they would use in response to each travel goal. They assume that the imposed time pressure and the instruction to respond with the mode that comes to mind first will facilitate automatic responses and rely on cognitively available structures. The frequency of responding with a particular travel mode is used as an indicator of habit strength.

When habits are strong, we no longer make reasoned choices. This implies that theories aimed at explaining reasoned actions, such as the theory of reasoned action (Fishbein & Ajzen, 1975; see Chapter 2), the theory of planned behaviour (Ajzen, 1985; see Chapter 2), or the norm activation model (Schwartz, 1977, described earlier in this chapter) are not particularly useful for explaining habitual behaviour. Indeed, research shows that when habits are strong, intentions are not related to behaviour (see Box 8.2).

Box 8.2 Applying theories: habit versus planned behaviour

Researchers compared two approaches to explaining travel behaviour choices, the theory of planned behaviour (Ajzen, 1985) and habits (Verplanken, Aarts, Van Knippenberg & Moonen, 1998). Travel behaviour is a good example of routine behaviour. Many trips are made frequently, which makes it quite likely that people no longer make conscious decisions about which travel mode to use. To test the theory of planned behaviour, the study first examined to what extent behaviour (i.e., proportion of car trips) could be explained by behavioural intention and perceived behaviour control. In addition, the researchers examined to what extent habit, and the interaction between intention and habit, were able to explain travel behaviour. They expected that habit would predict behaviour over and above behavioural intention. Moreover, with regard to the effect of the interaction between habit and intention on behaviour, the authors hypothesized that behavioural intention would be significantly related to behaviour only when habits were weak. In contrast, they expected that drivers would not make conscious decisions when habit was strong, and, consequently, that intention would not be significantly related to behaviour when habit was strong.

Respondents completed a survey that contained measures of attitude, subjective norm, perceived behaviour control and intention to use the car to destinations outside the village, as called for by the theory of planned behaviour. They also completed the response-frequency measure of general habit strength, as explained above. Following the survey, respondents kept a travel diary, in which they recorded all trips they made during a seven-day period. Based on the travel diary, the percentage of trips made as a driver to a destination outside the village was used as the dependent variable.

As expected, intention and perceived behaviour control were significantly related to the proportion of trips made by car. However, they explained only 5 per cent of the variance in behaviour, which suggests that the theory of planned behaviour is not very successful in explaining car use. Habit increased the proportion of variance explained by 5 per cent. Thus, also as being expected, habit predicted car use over and above variables from the theory of planned behaviour. In fact, habit appeared to be the strongest predictor. When the interaction between intention and habit was included in the regression analysis as well, the proportion of explained variance increased to 12 per cent (i.e., an additional 2 per cent was explained by this interaction). As hypothesized, behavioural intention was significantly related to car use when habit was weak. However, intention was not significantly related to car use when habit strength was moderate or strong.

In conclusion, the study revealed that habits set boundary conditions for the applicability of the theory of planned behaviour. People seem to be less likely to make reasoned choices when habits are strong.

Habits are highly functional for coping with daily life. They make it unnecessary to make repeated conscious decisions about how to act, because in many cases the circumstances are the same, and a person would come to the same decision anyway. However, habits may not always yield optimal outcomes; sometimes the circumstances of the situation have changed. For example, a new bus route can become available which makes the bus highly attractive compared with the car. Such changes may not be noticed when habits are formed. Habits result in selective attention: people may not pay attention to information that might change their choice. In general, habits are likely to be reconsidered only when the circumstances have changed significantly.

Promoting pro-environmental behaviour

In the previous section, we discussed various factors that influence environmental behaviour. This information is very important when interventions aimed at promoting pro-environmental behaviour are designed. Interventions will be more successful if they target factors that encourage or inhibit engagement in pro-environmental behaviour. For example, if a study shows that the level of recycling strongly depends on the availability of recycling facilities (e.g., curbside programmes, recycling bins), recycling can best be promoted by increasing the availability and quality of these facilities, but where studies show that a lack of information is related to a lack of recycling, education campaigns are more appropriate.

In general, two ways to change behaviour can be distinguished. First, interventions may target a person's perceptions, cognitions, motivations and norms. Second, interventions can be aimed at changing the consequences that follow behaviour.

Changing perceptions, cognitions, motivations and norms

Some interventions aim to change perceptions, cognitions, motivations and norms (see Abrahamse, Steg, Vlek & Rothengatter, 2005, or Schultz, Oskamp & Mainieri, 1995, for reviews). This approach expects that people will voluntarily change their behaviour in accordance with these interventions. For example, information campaigns can be developed to increase knowledge about recycling or to promote positive attitudes towards recycling. The approach assumes that increased knowledge or positive attitudes will result in higher recycling rates. Most of these strategies can be described as **antecedent strategies**, because they target factors that precede behaviour. An exception is feedback, which is a consequence strategy (see Chapter 3). In this section, we briefly discuss three kinds of interventions: provision of information, feedback and behavioural commitment.

Information campaigns can be aimed at increasing awareness of environmental problems, or knowledge about (environmental and other) consequences of various behavioural alternatives. This enables consumers to consider the

environmental consequences of their behaviour. Alternatively, information may be provided about the behaviour and expectations of others, thereby increasing awareness of desirable social norms. In general, the effects of information campaigns have been disappointing. The information may be effective in increasing knowledge (thus priming change), but priming often is not followed by a change in behaviour. This is especially true for mass media campaigns. Tailored information, that is, highly personalized information, appears to be more effective (see also Chapter 10). A study on energy conservation revealed that households which received information on ways to reduce their energy use tailored to their own situation saved more energy than a control group (Abrahamse, Steg, Vlek & Rothengatter, 2007). Information tailored to the needs, interests and desires of the target group increase the likelihood that people will pay attention to and elaborate on the information provided, which consequently improves the chances that their attitudes and behaviour will change accordingly.

Feedback consists of giving individuals information about the extent to which their behaviour changes have been successful (see also Chapter 3). Feedback may be given about the extent to which one's behaviour changed (e.g., 'you reduced your showering time by ten minutes this week'), the consequences of this behaviour (e.g., energy or water savings), or on the environmental impact of behaviour changes (e.g., reduction of emissions of greenhouse gases). In this way, individuals become aware of the relation between their behaviour and environmental consequences. As described in Chapter 3, feedback is given after a particular behaviour has been performed. Feedback can be quite effective in promoting pro-environmental behaviour, especially when it is frequently and immediately provided (see Box 8.3).

Box 8.3   Applying intervention strategies: effects of feedback on household gas use

Researchers compared the effectiveness of different types of feedback and information in reducing household gas use (Van Houwelingen & Van Raaij, 1989). All participating households received information about ways to reduce gas use. Then respondents were placed in one of five experimental conditions. The first group received information only. The second group were taught how to read their gas meter, to enable them to monitor their own gas use over time. The third group received monthly feedback on gas consumption, while the fourth group received daily feedback. The last group served as a control group.

Daily feedback was most effective in reducing gas consumption. Households who had received daily feedback saved 12.3%. Households who received monthly feedback reduced their gas consumption by 7.7%. Those who were taught to read their meter and those who had received information only were the least successful in reducing their gas consumption (savings of 5.1% and 4.3%, respectively). All the experimental groups

reduced their gas consumption, but no significant change was observed in the control group (0.3%). Unfortunately, interventions apparently must be maintained: one year after the intervention, gas use had increased for all groups, and the differences between groups disappeared.

Another intervention that can be quite effective in the environmental domain is behavioural commitment, that is, a written or verbal promise to perform a target behaviour (e.g., to recycle, or to reduce energy use by 5 per cent). This promise can be made privately or publicly. When made privately, the promise may activate a personal norm (see the section 'Norm activation model'), that is, people may feel obliged to engage in the particular behaviour. When the promise is made publicly, for example by an announcement in a local newspaper, people may act in accordance with their promise because they want to avoid the disapproval by others of their behaviour. As indicated in Chapter 3, commitment has been shown to have prolonged effects, and therefore may be superior to feedback.

Interventions often are more effective if they are combined. For example, feedback is likely to be more effective when people are provided with information on how to act pro-environmentally as well, or when people also commit themselves to act pro-environmentally. However, they do not guarantee change. Especially when habits are strong, these interventions may not succeed. Moreover, the strategies will have limited effects when people have few opportunities to change their behaviour, or when environmentally friendly behaviour is less attractive than their current behaviour. In these cases, stronger measures are needed, or measures that change the relative attractiveness of the behavioural alternatives. Some possible ways to do so are discussed in the next section.

Changing the incentives

In many cases, acting pro-environmentally is associated with greater costs to a person (in terms of time, money or effort), or difficult because of external barriers to pro-environmental actions. To put it differently, the incentives to act in one's self-interest often outweigh one's motivation to act pro-environmentally. Thus, changes in incentives may be needed in favour of pro-environmental behaviours, by means of consequence strategies. Pro-environmental behaviour is made more attractive or more feasible by rewarding it, and environmentally unfriendly behaviour is made less attractive by punishing it. For example, the attractiveness of cycling can be increased by the construction of cycle lanes, or car use can be made less attractive by increasing taxes related to driving. Advocates of this approach hope that attitudes and preferences eventually will change in the same direction, because behaviour changes are likely to be more robust when they are supported by changes in attitudes and preferences.

Three strategies may be considered. First, *pricing policies* can be implemented, to reduce the cost of pro-environmental behaviour or increase costs for

environmentally unfriendly alternatives. This may be effective because currently many pro-environmental products are more expensive (e.g., organic food or heavier insulation) than regular products. Second, *legal measures* can be implemented. For example, laws can be implemented that prohibit the use of propellants in spray cans, or speed limits may be introduced to reduce emissions of exhaust gases and air pollution. Such measures will be effective only if the laws and regulations are accepted by most people and enforced, and violations are met with sanctions. Third, the *availability and quality of products and services* can be changed. For example, environmentally harmful behavioural options may be made less feasible or even impossible, such as closing off town centres to motorized traffic. Alternatively, new or better (pro-environmental) behaviour options may be provided, such as recycling bins or organic products. Also, environmentally friendly technologies aimed at reducing environmental impact per unit may be introduced. For example, energy-efficient washing machines or refrigerators provide the same service but use less energy.

In sum, strategies aimed at changing the incentives may be aimed at rewarding 'good' behaviour or punishing 'bad' behaviour. As explained in Chapter 3, penalties are believed to be less effective, because they are more likely to result in negative emotions and attitudes. In such cases, individuals engage in behaviour to avoid negative consequences. When enforcement is not consistent, or ceases, behaviours are likely to return to their previous state. Moreover, penalties can be difficult to implement when they evoke strong public resistance. Both rewards and penalties will be more successful when they are just sufficient to initiate behaviour change. In that case, people are more likely to attribute their behaviour change to their personal convictions, whereas when too-strong rewards or penalties are offered, people may attribute their change in behaviour to the rewards or penalties. Consequently, they may only have short-term effects (i.e., as long as they are in place), because people probably will not have changed their attitudes.

Applied social psychology in context

This chapter describes how social psychologists can significantly contribute to the understanding and improvement of human–environment relationships. However, the relationship between humans and their physical environments is affected by many factors, not only social-psychological ones. Therefore, input from other disciplines is needed to optimize human–environment relationships. For example, when studying negative effects of environmental conditions on health and well-being, input from epidemiology, medicine or health sciences is advisable. When studying the effects of pricing strategies, input from economists is advisable. When studying pro-environmental behaviour, one should be aware of the environmental impact of different types of behaviour to be able to decide which behaviour truly is pro-environmental, and so input from environmental

scientists is needed. Environmental scientists can help social psychologists focus their efforts on behaviour that is most significant from an environmental point of view (see Chapter 1). For instance, when trying to reduce environmental impacts of households, we may do better to focus on reducing thermostat settings than on reducing showering time, because the environmental impact of the former is much higher. Such behaviour changes should of course be feasible and acceptable to those involved. Thus, the feasibility and acceptability of behaviour changes should be studied in conjunction with environmental impact. Social and environmental psychologists can play an important role in this respect.

However, as indicated in the introductory chapter, working in interdisciplinary settings is not easy. Understanding a problem from one's own disciplinary point of view is already difficult, but adding the perspectives and insights from other disciplines adds to the complexity. However, when researchers are willing to understand different perspectives, to clarify the background of their own perspective and to examine possibilities of integrating different views, interdisciplinary cooperation yields better and more comprehensive views on human–environment relationships and possible ways to improve them.

Conclusion

Environmental quality is essential for human health and well-being. Therefore, the built environment needs to be improved and the natural environment needs to be protected. Social psychologists have an important role to play in this respect. First, they can study how various environmental conditions affect social interaction, health, well-being, performance and behaviour how negative effects can be reduced and how positive effects may be enhanced. The extent to which environmental conditions threaten or enhance the quality of life depends on many social-psychological factors, including attitudes, norms and perceived control. These factors provide opportunities for interventions aimed at improving the well-being of people and other living things.

Second, social psychologists examine factors influencing behaviours that contribute to environmental problems. Social-psychological factors encourage individuals to act pro-environmentally or not. Because many pro-environmental actions have relatively high costs, moral considerations (i.e., concerns about what is the right thing to do) play an important role. Habits may inhibit people from acting pro-environmentally, but pro-environmental acts can become habitual as well.

Third, social psychologists can explore the effectiveness, acceptability and feasibility of policies aimed at reducing environmental problems through behavioural changes. Behaviour can be changed by changing perceptions, cognitions, motivations, goals and norms. If pro-environmental behaviour is unattractive, these interventions generally have limited effects. In those cases, interventions should be

implemented in the form of societal-level incentives, to make pro-environmental actions an inviting option.

An interdisciplinary approach to all these topics is valuable, because substandard human–environmental relationships may be caused by a wide range of factors understood by multiple disciplines. Social psychologists should cooperate with other disciplines. Multidisciplinary research and collaboration enables social psychologists to take advantage of the knowledge and perspectives of other disciplines, and to create a comprehensive and integrated understanding of a problem that has a better chance of solving it.

Glossary

Altruistic value orientation: values that reflect concern for the welfare of other human beings.

Antecedent strategies: strategies that target factors that precede behaviour.

Behavioural commitment: a written or verbal promise to perform a target behaviour.

Biospheric (or ecocentric) value orientation: values that reflect concern with non-human species and the biosphere.

Commons dilemma: a situation in which individual and collective interests conflict.

Consequence strategies: strategies aimed to change the incentives following a behaviour.

Egoistic value orientation: values that reflect concern with individual costs and benefits.

Environmental behaviour: any behaviour that changes the availability of materials or energy from the environment or alters the structure and dynamics of ecosystems or the biosphere.

Global warming: an increase in the earth's average temperature, resulting in climate change.

Habit: goal-directed behaviour that is guided by automated cognitive processes.

Indirect energy use: the energy needed to produce, transport and dispose of goods.

New environmental paradigm (NEP): one's fundamental beliefs about relationships between humans and the environment.

Self-serving denial: denial of a moral obligation to act pro-environmentally in order to justify a choice to act in an environmentally unfriendly manner.

Social design: designing buildings in a way that benefits the people who live or work in the building, or visit it, by systematically incorporating their needs and ideas into the design.

Values: desirable trans-situational goals that vary in importance and serve as guiding principles in one's life.

Review questions

1. Why are correlations between objective noise levels and noise annoyance generally low?
2. Which three general value orientations are distinguished in the environmental literature? Briefly explain each of these.
3. What is meant by commitment? Which types of commitment can be distinguished?
4. Why are rewards often more effective than penalties for promoting pro-environmental behaviour?

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