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THE ROLE OF ATTITUDES IN ENVIRONMENTAL ISSUES

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The prime motive of science is not to control the Universe but to appreciate it more fully.
It is a huge privilege to live on Earth and to share it with so many goodly and fantastical creatures.
—Colin Tudge

Introduction

We live in a geologic period described as the Anthropocene, in which human activity is the dominant influence on the Earth's ecosystems (see Waters et al., 2016). Indeed, current global environmental problems are unparalleled in their complexity and their spatial and temporal reach. Left unchecked, the environmental impacts of human activity will result in irrevocable damage to the ecosystem. Collective efforts by people across national and cultural boundaries are required to address environmental problems and to adapt to our changing world. The goal of this chapter is to describe the role of attitudes in understanding and solving environmental issues (for other reviews, see Gifford & Sussman, 2012; Heberlein, 2012).

Public Opinion About Environmental Issues

Public opinion surveys have consistently shown that environmental problems are a salient issue on people's minds and considered to be high priority. Moreover, the relevance of environmental problems for people is not new, as illustrated by findings from the 24-country *Health of the Planet Survey*, conducted with representative samples in industrialized and developing nations (Dunlap, Gallup, & Gallup, 1993). The initial open-ended question of the survey asked respondents, "What do you think is the most important problem facing our nation today?" Environmental problems appeared among the top three most frequently mentioned national problems in 16 out of the 24 countries. The second question asked respondents to rate their environmental attitude with the question, "How concerned are you personally about environmental problems?" A majority of respondents in 21 of the 24 nations reported the top two response options (either "a fair amount" or "a great deal of concern"), and higher levels of concern were observed among respondents in the developing rather than in the industrialized nations. Respondents were also presented with an environment-versus-economy tradeoff question and asked to choose one of the following two options:

- "protecting the environment should be given priority, even at the risk of slowing down economic growth," or
- "economic growth should be given priority, even if the environment suffers to some extent."

Environmental protection was chosen by a majority in all nations (except Nigeria, India, and Turkey).

More recent analyses of data from the World Values Survey (Milfont & Schultz, 2016) showed that a majority of respondents from the 78 sampled nations ($N = 308,539$) endorsed the value "looking after the environment." These results indicate that people from around the globe are aware of environmental problems and hold positive attitudes toward environmental protection.

Defining Environmental Attitudes

Environmental attitudes are a central construct in the field of environmental psychology, and reviews of publications in the major journals show that more than half of all peer-reviewed articles in the field deal with them (see Kaiser, Wölfing, & Fuhler, 1999; Milfont, Duckitt, & Wagner, 2010). Given the importance of attitudes to the field, it is not surprising that a multitude of definitions have been provided over the years. Table 11.1 illustrates some of the previous definitions.

Looking at the examples shown in Table 11.1, there is a general agreement that environmental attitudes: (1) are evaluations—the assignment of positive or negative feelings—to some entity; and (2) have an affective, cognitive, and behavioral basis, which is in line with contemporary definitions of attitudes (Albarracín, Zanna, Johnson, & Kumkale, 2005; Eagly & Chaiken, 1993).

Following these conceptualizations and our earlier definitional attempts (Milfont, 2007, 2012c; Oskamp & Schultz, 2005; Schultz, Shriver, Tabanico, & Khazian, 2004), we provide this mutually agreeable definition:

> *Environmental attitudes are evaluative beliefs, affect, and/or behavioral intentions about environmentally related activities or issues.*

Measuring Environmental Attitudes

In their discussion of the questionnaire tradition in the measurement of personality, McCrae and John (1992) noted that "until recently, only a small minority of questionnaire researchers were concerned with the issue of consensus—most preferred to generate new scales rather than organize those already

Table 11.1 Examples of Environmental Attitudes Definitions

Environmental attitudes are . . .

"an organization of beliefs, including an overall evaluation, liking and disliking for some aspects of the environment, the environment as a whole, or some object which has clear and direct effects on the environment, such as power plants" (Heberlein, 1981, p. 5)

"people's orientations toward environmentally related objects, including environmental problems themselves and problem-solving actions, and [divided] into three types: cognitive, affective, and evaluative environmental orientations" (Yin, 1999, p. 63)

"perceptions of or beliefs regarding the physical environment, including factors affecting its quality (e.g., overpopulation, pollution)" (Gallagher, 2004, p. 97)

"concern for environmental quality or 'environmental concern'" (Dunlap & Jones, 2002, p. 483)

"the collection of beliefs, affect, and behavioral intentions a person holds regarding environmentally related activities or issues" (Schultz et al., 2004, p. 31)

"*concern* for the environment or caring about environmental issues" (Gifford & Sussman, 2012, p. 65, emphasis in original)

"a psychological tendency to evaluate the natural environment, and factors affecting its quality, with some degree of favor or disfavor" (Milfont, 2012c, p. 270)

available" (p. 186). The same is true for environmental attitudes research—most researchers favor proposing their own new scale. Indeed, hundreds of environmental attitudes measures are available (Dunlap & Jones, 2002), leading to an "anarchy of measurement" (Stern, 1992, p. 279). As a result, research on environmental attitudes has been criticized as noncumulative and atheoretical (Dietz, Stern, & Guagnano, 1998; Heberlein, 1981).

To provide some organization to the field, Dunlap and Jones (2002) proposed a four-fold typology to group environmental-related measures based on the specific topic examined (e.g., water pollution, population growth) and its expression of concern (i.e., general beliefs, attitudes, intentions, and behaviors related to environmental issues). Using this typology, there are measures that focus on (1) multiple environmental issues and multiple expressions of concern, (2) multiple environmental issues and a single expression of concern, (3) a single environmental issue and multiple expressions of concern, and (4) a single environmental issue and a single expression of concern. A measure designed to access individuals' attitudes toward recycling is an example of the last type because it focuses on a single topic and on evaluative judgments.

Such ~~single-topic-single-expression~~ measures are more related to the principle of compatibility, which requires that attitudinal and behavioral measures involve similar actions, targets, contexts, and time elements (Ajzen & Fishbein, 2005). However, most measures designed to assess environmental attitudes can be described as multiple-topic/multiple-expression because they access multiple environmental issues and expressions of concern (often evaluative judgements plus attitudinal beliefs). Moreover, most measures designed to assess environmental attitudes use direct self-report methods with fewer examples of environmental attitude measures using implicit measurement techniques (for a detailed discussion of attitude measurement and implicit attitudes, see Krosnick, Judd, & Wittenbrink; and Gawronski, this volume).

Direct Self-Report Methods

Direct self-reports are based on questionnaires that explicitly ask participants to indicate their own attitudes and hence may be referred to as explicit measurement techniques. Here we review two widely used measures. For a detailed summary of 18 environmental attitudes measures, see McIntyre and Milfont (2015).

New Environmental Paradigm Scale

The New Environmental Paradigm (NEP) scale (Dunlap & Van Liere, 1978), and the revised version, the New Ecological Paradigm scale (Dunlap et al., 2000), is the most widely used measure of environmental attitudes (EA; Dunlap, 2008; Dunlap & Jones, 2002; Hawcroft & Milfont, 2010; Stern, Dietz, & Guagnano, 1995). The NEP Scale measures the degree to which an individual believes humans are a part of nature rather than being independent from and superior to nature. The original scale comprised 12 items and the revised version includes 15 items (Dunlap et al., 2000), with three items reflecting each of five hypothesized components of an ecological worldview. These five facets are: *the reality of limits to growth* (e.g., "We are approaching the limit of the number of people the earth can support"); *antianthropocentrism* (e.g., "Plants and animals have as much right as humans to exist"); *the fragility of nature's balance* (e.g., "When humans interfere with nature it often produces disastrous consequences"); rejection of exemptionalism (e.g., "Despite our special abilities humans are still subject to the laws of nature"); and the possibility of an eco-crisis (e.g., "Humans are severely abusing the environment"). Despite presenting these five facets, researchers typically average responses to the 15 NEP items to generate a single overall score.

Environmental Attitudes Inventory

The Environmental Attitudes Inventory (EAI; Milfont & Duckitt, 2010) assesses a broad range of evaluative beliefs, affect, and behavioral intentions regarding the natural environment. The measure was created based on an attempt to integrate past measures (Milfont & Duckitt, 2004). The EAI measures 12 distinct dimensions: Enjoyment of Nature, Support for Interventionist Conservation Policies, Environmental Movement Activism, Environmental Fragility, Personal Conservation Behavior, Ecocentric Concern, Support for Population Growth Policies, Altering Nature, Conservation Motivated by Anthropocentric Concern, Confidence in Science and Technology, Human Dominance over Nature, and Human Utilization of Nature. The full version of the EAI has 120 items, but shorter and balanced versions of the scale with 72 and 24 items are available (Milfont & Duckitt, 2010). Some sample items of Enjoyment of Nature include "Being out in nature is a great stress reducer for me," and "I think spending time in nature is boring" (reversed). Some sample items of Altering Nature include "The idea that natural areas should be maintained exactly as they are is silly, wasteful, and wrong," and "Turning new unused land over to cultivation and agricultural development should be stopped" (reversed).

Implicit Methods

While direct self-report methods rely on explicit ratings of agreement or approval, implicit measurement techniques use more indirect methods. The Implicit Association Test (Greenwald, McGhee, & Schwartz, 1998) is a well-known measure of this type and asks participants to categorize target concepts along attribute dimensions as they appear on a computer screen. Scoring is based on the speed by which different stimuli can be classified, and the IAT measures the relative strength of association between pairs of cognitive concepts. For example, nature = good versus built = bad; or nature = me versus built = not me.

Schultz and colleagues (2004; Schultz & Tabanico, 2007) used the Implicit Association Test to measure connectedness with nature by employing two target concepts (i.e., Nature and Built) and two attribute dimensions (i.e., Me and Not me). In the IAT-Nature, participants are asked to match an item with the appropriate category across 20 different stimuli. The categories and their respective items were "Nature" (animals, birds, plants, whales, trees), "Built" (building, car, city, factory, street), "Me" (I, me, mine, myself, self), and "Not me" (it, other, their, them, they). The degree of connectedness with nature was calculated as the difference in response time between compatible (Nature/Me and Built/Not me) and incompatible (Built/Me and Nature/Not me) trials. Compatible trials should be easier than the incompatible trials if a person has a stronger association with natural than with built environments. In contrast, if the association between the self and built environments is stronger, incompatible trials should be easier than the compatible trials.

Schultz and colleagues (2004) found that participants tended to associate themselves more easily with natural than with built environments and that this implicit measure of connectedness with nature correlated with explicit measures of EA. Schultz and Tabanico (2007) also reported changes in implicit connection with nature after participants had spent time in natural environments. As an extension, Bruni and Schultz (2010) developed a game interface for the IAT-Nature measure, Flexi Twins, available at www.flexitwins.com. Reported results showed that the game provided good psychometric properties and that environmental activists had stronger implicit connections with nature than did members of the general public, as did children ages 10 to 11. Other results using the game interface have found that spending time at a zoo increases implicit connections with nature, as does engagement in creative art activities (Bruni, Fraser, & Schultz, 2008; Bruni, Winter, Schultz, Omoto, & Tabanico, 2017).

General or Specific Environmental Attitudes

The literature ~~in the environmental domain~~ has distinguished between measuring general environmental attitudes ~~and~~ measuring specific attitudes toward particular environmentally relevant behaviors such as recycling (Thøgersen, 1996), wildlife species protection (Tarrant, Bright, & Cordell, 1997), or sustainable travel (Gärling, Bamberg, & Friman, this volume). Although there can be ~~high~~ compatibility ~~for~~ global attitudes and multibehavior measures, ~~such~~ specific environmental attitudes more closely follow the principle of compatibility ~~so that~~ behavior-specific attitudes take into consideration the target, action, context, and time elements that describe the behavior. ~~While~~ the relationships between general environmental attitudes and specific proenvironmental behaviors typically yield weak effects (Bamberg, 2003), the relationships between specific attitudes and behavioral intentions and behaviors tend to be stronger. To illustrate, specific recycling attitudes are likely to predict recycle intentions more strongly than general environmental attitudes would.

However, the strong relationship between specific attitudes and intentions and behaviors could be merely a result of content overlap between the measures. Kaiser (2006) supported this when pointing to the complementarity of behavior-based environmental attitudes and proenvironmental behavior. Moreover, attitudes are often so specific and so tied to the behavior examined that predictions of the conditions under which the behavior is initiated are limited (Baldassare & Katz, 1992, Note 2). Therefore, it seems preferable to use general environmental attitudes to predict proenvironmental behavior, even if this relationship yields weak effects, because this would show ~~real~~ rather than ~~methodological~~ associations.

Another approach is to test the indirect ~~prediction~~ of environmental attitudes on proenvironmental behavior. For instance, Bamberg (2003) showed that general environmental attitudes are an important indirect determinant of specific behavior in reasoned-action approaches. General environmental attitudes had a direct effect on the perception and evaluation of situation–specific cognitions, particularly the personally salient behavioral consequences, rather than a direct effect on intention or behavior.

Dimensionality of General Environmental Attitudes

Attitude measures often yield a single score representing a person's valenced evaluation of the attitude object, ranging from a negative reaction at the low end to a positive reaction at the high end. Similarly, environmental attitudes have been traditionally viewed as unidimensional, with individuals' attitudes ranging from unconcerned about the environment to concerned about the environment (Schultz, 2000). Contrasting this approach of viewing environmental attitudes as unidimensional, research has proposed value-based orientations regarding concerns for environmental issues when developing multidimensional conceptualizations of environmental attitudes. These value-based models of environmental concern have included two dimensions—anthropocentric (concern for humans) and ecocentric (concern for all living things) environmental concerns (Thompson & Barton, 1994)—or three dimensions—egoistic (concern for the self), altruistic (concern for other people), and biospheric (concern for all fauna and flora) (Milfont, Duckitt, & Cameron, 2006; Schultz, 2001; Stern & Dietz, 1994).

Stimulated by considerations of the dimensionality of environmental attitudes and earlier factor-analytic studies (e.g., Blaikie, 1992; Wiseman & Bogner, 2003), Milfont and colleagues conducted a series of studies to investigate the multidimensional and hierarchical nature of environmental attitudes (Milfont, 2007, 2009a, 2010; Milfont & Duckitt, 2004, 2006, 2010; Milfont et al., 2010). The multidimensional, horizontal structure of environmental attitudes refers to the number of specific evaluative beliefs, affect, and/or behavioral intentions regarding environmentally related activities or issues. The hierarchical, vertical structure refers to the cognitive organization of the horizontal structure. In

psychometric terms, first-order factors form the horizontal structure, while the organization of these first-order factors into higher-order dimensions forms the hierarchical structure.

Research conducted by Milfont and colleagues showed that Preservation and Utilization form the two higher order dimensions of environmental attitudes. Preservation attitudes express preserving nature and the diversity of natural species in its original natural state and protecting it from human exploitation. In contrast, Utilization attitudes express the idea that it is right, appropriate, and necessary for nature and all natural phenomena and species to be used and altered for human objectives. Empirically, these dimensions distinctly predict proenvironmental behavior and economic liberalism, respectively (Milfont & Duckitt, 2004), and are also distinctly related to a number of other variables (for a meta-analytical summary, see Milfont, 2012c). Qualitative analysis also indicates that Preservation and Utilization attitudes elicit distinct psychological meaning in respondents (Milfont, 2010). Theoretically, Preservation and Utilization attitudes are related to prior conceptualizations of two broad dimensions about human–nature relations. Table 11.2 illustrates the connections between these dimensions and prior arguments in the literature. Moreover, these two broad environmental attitudes are related to environmental sustainability, which implies a balance between using while preserving natural resources. Indeed, Preservation and Utilization attitudes and the dimensions in Table 11.2 express a dilemma between use and preservation. Indeed, Blaikie (1992) argued that these two broad dimensions . . .

> reflect(s) some of the dilemmas which people experience in trying to balance the need both to be aware of the delicate balance between humans and the rest of the natural world, and to conserve the natural environment, while at the same time recognizing that some forms of exploitation of the environment are needed if standards of living are to be maintained.
>
> *(p. 161)*

Table 11.2 Examples of Conceptual Arguments Related to Utilization and Preservation Attitudes

Utilization	*Preservation*	*Example of reference*
Humans over nature	Humans in nature	Kluckhohn (1953)
Dominant Social Paradigm	New Environmental Paradigm	Dunlap and Van Liere (1978)
Development of natural resources	Preservation of natural resources	Pierce and Lovrich (1980)
Individualistic social solidarity and related myths of nature	Egalitarian social solidarity and related myths of nature	Douglas and Wildavsky (1982)
Instrumental views of people–environment relations	Spiritual views of people–environment relations	Stokols (1990)
Mastery values	Harmony values	Schwartz (1994)
Anthropocentric concern	Ecocentric concern	Thompson and Barton (1994)
First Concept of Environmental Sustainability	Third Concept of Environmental Sustainability	Dobson (1998)
Cornucopian versus	Malthusian theory	Barbieri (1997)
Consumeristic value orientation	Nonconsumeristic value orientation	Brown and Cameron (2000)
Cultures of Progress	Cultures of Survival	Witten-Hannah (2004)
Utilitarian values	Moral/altruistic values	Kaiser and Scheuthle (2003)

Functions of Environmental Attitudes

The classic functionalist view of attitudes proposed by ~~Smith et al. and Katz~~ posit that the three main attitude ~~purposes~~ are to help us understand the world, express our basic values, and enhance and maintain our self–esteem. Milfont (2009b) proposed a functional approach to environmental attitudes based on these classic functionalist views. Environmental attitudes provide a summary evaluation and thus help us understand the world by simplifying knowledge about objects in the natural ~~(and built)~~ environment and by extending and reaffirming our understanding of the surrounding environment and our place in it. Environmental attitudes also help us to establish our self–identity by giving us the opportunity to express held values and convictions. Finally, environmental attitudes help to protect oneself from the threats that the natural ~~(and built)~~ environment are perceived to pose.

Factors Influencing Environmental Attitudes

Individuals differ in their levels of environmental attitudes. This section reviews key variables that form the sociopsychological foundations of environmental attitudes. We review the associations between environmental attitude, seven demographic variables, and four psychological variables (val–ues, personality traits, ideological orientations, and self–efficacy).

Demographic Variables

Sex

Research on the association between sex and environmental attitudes has produced generally con–sistent findings. Overall, females tend to hold more positive environmental attitudes than males (e.g., Franzen & Vogl, 2013; Korfiatis, Hovardas, & Pantis, 2004; Zelezny, Chua, & Aldrich, 2000). Schol–ars have explained sex differences in environmental attitudes in terms of gender–socialization and gender–role theories. Women are socialized to be interdependent and cooperative and to empathize with the needs and welfare of others. These characteristics acquired during socialization and gender role expectations/experiences give rise to a stronger empathic concern regarding other animals and the natural environment in women compared to men. Providing empirical support for these ideas, mediation studies have shown that ~~emphatic~~ concern helps explain sex differences in environmental attitudes ~~(Arnocky & Stroink, 2011; Milfont & Sibley, 2016)~~. Adding to this line of work, research has also shown that social dominance orientation ~~(SDO)~~ —the degree to which an individual desires group–based hierarchies and inequalities (Pratto, Sidanius, Stallworthm, & Malle, 1994; Sidanius & Pratto, 1999; see more about this construct in what follows)—help explain these sex differences. Women tend to display higher levels of environmental attitudes and lower levels of exploitative atti–tudes toward nonhuman animals because women are higher in empathy and lower in ~~SDO~~; in con–trast, men tend to displays lower levels of environmental attitudes and higher levels of exploitative attitudes toward nonhuman animals because men are lower in empathy and higher in ~~SDO~~ (Graça, Calheiros, Oliveira, & Milfont, 2018; Milfont, Richter, Sibley, Wilson, & Fischer, 2013, Study 4; Milfont & Sibley, 2016; for a detailed discussion of attitudes and gender, see Diekman & Glick, this volume).

Age

Studies examining the association between individuals' age and their levels of environmental attitudes have found mixed results. Some studies have reported that younger individuals are more likely to hold more positive environmental attitudes than older individuals (e.g., Fransson & Gärling, 1999; Hines, Hungerford, & Tomera, 1987; Van Liere & Dunlap, 1980). Other studies have found the opposite

pattern, with older individuals holding greater levels of environmental attitudes than younger individuals (e.g., Korfiatis et al., 2004; Mayer & Frantz, 2004, Study 4; Milfont, 2012c; Schwartz, 2005). A meta-analysis has confirmed that the relationship between age and environmental attitudes is mixed and often negligibly small but also notes that certain outcomes—engage with nature, avoid environmental harm, and conserve raw materials and natural resources—are more likely in older individuals (Wiernik, Ones, & Dilchert, 2013).

~~Mixed results regarding the association between age and environmental attitudes are likely due to cohort effects. One study examined whether a positive association between age and proenvironmental behavior could be explained by maturation or learning (Otto & Kaiser, 2014). The findings indicated that the more exposed people are to environmental information, the more pronounced their ecological engagement. Future studies examining the association between age and environmental attitudes should consider cohort and generational effects, and variables that could explain associations with age.~~

Political Orientation

Research findings indicate that greater levels of environmental attitudes are observed among those who endorse liberal political ideology (e.g., Buttel & Flinn, 1978; Fransson & Gärling, 1999; Kilbourne, Beckmann, & Thelen, 2002). This consistent finding has been more recently confirmed in relation to climate change beliefs (e.g., Malka, Krosnick, & Langer, 2009; McCright & Dunlap, 2011; Milfont, 2012b). Indeed, a meta-analysis examining the determinants of belief in climate change showed that political affiliation and political ideology were the ~~largest~~ demographic ~~correlate of~~ climate change beliefs (Hornsey, Harris, Bain, & Fielding, 2016; for a detailed discussion of attitudes and political ideology, see Stern & Ondish, this volume).

Religiosity

In a seminal *Science* article, White (1967) blamed Judeo-Christian beliefs for the planet's ecological crisis because these religious traditions emphasize anthropocentric views of the environment and a belief in human dominance over nature. Overall support for his claim emerged from studies showing that individuals from a Judeo-Christian tradition and those expressing higher levels of religiosity and literal beliefs in the Bible tend to have lower levels of environmental attitudes and proenvironmental engagement than their counterparts (Gardner & Stern, 2002; Milfont, 2012c; Schultz, Zelezny, & Dalrymple, 2000). Higher levels of religiosity, measured by church attendance, are also related to climate change denial (McCright & Dunlap, 2011). A recent study confirmed the association between religious fundamentalism and lower proenvironmental intentions (Bulbulia, Troughton, Greaves, Milfont, & Sibley, 2016).

Interestingly, there is reason to believe that the association between Judeo-Christian beliefs and environmental attitudes may be changing due to fundamental shifts in the church's interpretation of the Bible. This is best illustrated in Pope Francis's "Encyclical on the Environment and Human Ecology" published in 2015:

> Nature cannot be regarded as something separate from ourselves or as a mere setting in which we live. We are part of nature, included in it and thus in constant interaction with it.
>
> *(Chapter 4)*

Future studies should explore the extent to which this overt focus on environmental protection by Pope Francis will have repercussion inside his religious denomination as well as in other denominations and the broader society. More research is also needed examining the associations between other religious traditions and environmental attitudes (e.g., Morrison, Duncan, & Parton, 2015).

Socioeconomic Status

Research has indicated a positive association between income and higher levels of proenvironmental engagement (Fransson & Gärling, 1999; Theodori & Luloff, 2002; Van Liere & Dunlap, 1980). The association between income and environmental attitudes might operate at both individual and aggregate levels of analysis. Analyzing 22-country data from the 1993 International Social Survey Programme, Kemmelmeier, Krol, and Young (2002) showed that willingness to protect the environment was higher for respondents with higher levels of education and income and for those holding postmaterialist values. At the country level, they found that greater affluence (measured by the gross national product per capita) was related to higher postmaterialism and greater willingness to protect the environment. They also observed a cross-level interaction: the correlation between personal income and willingness to protect the environment was greater in countries that had experienced recent economic growth. Their findings support Inglehart's (1995) argument that a shift from materialist values (personal and national security, economic well-being) to postmaterialist values (quality of life, self-expression), led by economic prosperity and political security, results in societies' becoming more environmentally concerned.

Education Level and Knowledge of Environmental Issues

More educated individuals tend to uphold more environmental attitudes and attribute greater importance to biocentric orientations than less educated individuals do (Fransson & Gärling, 1999; Hines et al., 1987; Olofsson & Öhman, 2006). Studies have also shown the importance of knowledge of environmental issues for both environmental attitudes and behavior (e.g., Hines et al., 1987; Kaiser & Fuhler, 2003; Lévy-Leboyer, Bonnes, Chase, & Ferreira-Marques, 1996). Overall, higher environmental knowledge is related to higher environmental attitudes. In a meta-analysis of recycling behavior, for example, knowledge was found to have the highest correlation with a score of propensity to recycle, which combined attitudes toward recycling, behavioral intentions, and actual recycling (Hornik, Cherian, Madansky, & Narayana, 1995).

Parental Status

Having children may contribute to overpopulation and resulting environmental consequences, which has led some individuals to decide not to reproduce (Arnocky, Dupuis, & Stroink, 2012). At the same time, parents may have a stronger motivation to care about the future of the planet for their offspring, with research showing that parents tend to be more environmentally concerned than nonparents (Dupont, 2004; Hamilton, 1985). That parents tend to show more positive environmental attitudes may result from an increase in generativity concerns—desire to leave a positive legacy to future generations, which might include environmental protection (Milfont & Sibley, 2011)—and research has shown the implication of parental status in relation to climate change (Milfont, Harré, Sibley, & Duckitt, 2012).

Psychological Variables

Values

Scholars and practitioners have highlighted the important role of human values to understand and tackle environmental problems. To illustrate, a seminal report by the World Wildlife Fund (WWF) argued that "any adequate strategy for tackling environmental challenges will demand engagement with the values that underlie the decisions we make—and, indeed, with our sense of who we are" (Crompton,

2008, p. 5). The majority of research in the area has employed Schwartz's (1992) theory of human values, which identifies 10 motivationally distinct types of values—achievement, hedonism, stimulation, self-direction, universalism, benevolence, tradition, conformity, security, and power—grouped into four higher-order value clusters. These value clusters are Openness to Change (values favoring change and independent thought and behavior) versus Conservation (preservation of traditional practices and stability) and Self-Transcendence (concern for the welfare of others) versus Self-Enhancement (pursuit of one's own relative success and dominance over others). Research has consistently shown that Self-Transcendence values correlate positively with proenvironmental engagement, while Self-Enhancement values correlate negatively (e.g., Coelho, Gouveia, & Milfont, 2006; Karp, 1996; Schultz, 2001; Schultz et al., 2005; Schultz & Zelezny, 1999; Stern & Dietz, 1994; Stern, Dietz, Kalof, & Guagnano, 1995). A meta-analytical review confirmed that the motivational underpinnings of environmental attitudes are strongly linked to self-transcendence values (Boer & Fischer, 2013; for a detailed discussion of motivational influences on attitudes, see Earl & Hall, this volume).

Personality Traits

The Big Five model of personality is one of the most used personality models and has been used to predict a wide range of outcomes (Goldberg, 1990; McCrae & Allik, 2002; McCrae & John, 1992). In brief, the Big Five model proposes a structure of personality traits formed by the five broad trait dimensions of Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness to Experience. Extraversion includes traits such as being outgoing, energetic, and assertive and reflects an orientation to maximize gains from social relations. Agreeableness includes traits such as being compliant, pleasant, and cooperative and caring strongly about the well-being of family and friends, reflecting a greater investment in reciprocal social arrangements. Conscientiousness includes traits of carefulness, responsibility, and organization and reflects greater investment in long-term planning. Neuroticism includes traits such as depression, anxiety, anger, and insecurity and reflects investment in close relationships as well as greater monitoring of inclusionary status and signals of rejection from others. Finally, Openness to Experience is characterized by intelligence, imagination, and engagement in ideas-related endeavors and reflects tolerance for all people and investment in seeking novel solutions and gains.

Recent studies have examined the associations between the Big Five personality traits and environmentally related outcomes. Hirsh and Dolderman (2007) found that greater environmentalism was associated with higher levels of Agreeableness and Openness among Canadian undergraduate students. In two other studies conducted in Canada, Nisbet, Zelenski, and Murphy (2009) found that greater perceived relatedness with nature was greater for those participants with higher levels of Agreeableness and Openness. In another study, Hirsh (2010) found that greater environmental concern was significantly associated with higher levels of Agreeableness, Openness, Neuroticism, and Conscientiousness in a community sample from Germany but that the associations were much stronger for Agreeableness and Openness. The positive association between proenvironmental engagement and Openness was also observed in undergraduate and community samples in the United States (Markowitz, Goldberg, Ashton, & Lee, 2012). Extending these studies, Milfont and Sibley (2012) examined the associations between the Big Five personality traits and proenvironmental engagement at the individual level of analyses (using national New Zealand samples) as well as at the societal level of analyses. They found that across both individuals and nations, Agreeableness, Conscientiousness, and Openness were the traits most strongly associated to proenvironmental engagement. Agreeableness and Openness were also the personality traits more strongly associated with two core climate change beliefs ("climate change is real" and "climate change is caused by humans"; Milfont, Milojev, Greaves, & Sibley, 2015; for a detailed discussion of personality influences on attitudes, see Briñol & Petty, this volume).

Ideological Orientations

Right-wing authoritarianism ~~(RWA)~~, social dominance orientation ~~(SDO)~~, and system justification are ideological variables that help explain group-based oppression and prejudice. A growing body of research has shown that these ideologies explaining human outgroup prejudice are also key ideological motives that legitimate humans as fundamentally distinct from and superior to the natural environment and (nonhuman) animals. Environmental attitudes are higher among individuals who hold lower levels of ~~RWA~~ (Altemeyer, 2003; Iwata, 1977; Milfont & Duckitt, 2010; Peterson, Doty, & Winter, 1993; Ray, 1980; Schultz & Stone, 1994), lower levels of ~~SDO~~ (Jackson, Bitacola, Janes, & Esses, 2013; Milfont et al., 2013; Pratto et al., 1994; Wang, 1999), and lower levels of system justification (Feygina, Jost, & Goldsmith, 2010). A recent study has provided cross-cultural evidence for the associations between ~~SDO~~ and proenvironmental behaviors (Milfont et al., in press).

Self-Efficacy

Perceived personal efficacy is an important predictor of proenvironmental engagement (Bamberg & Möser, 2007). Research has also shown that perceived ability (or inability) to influence climate change outcomes impacts concern and motivation to act in relation to this issue (Aitken, Chapman, & McClure, 2011; Milfont, 2012b).

Main Theoretical Models

In this section, we review the main theoretical models used to understand the role of attitudes in environmental issues.

Theory of Planned Behavior

The theory of planned behavior (TPB; Ajzen, 1991), an extension of the theory of reasoned action (Ajzen & Fishbein, 1980) is one of the most influential and highly cited predictive psychological models (Ajzen, 2011). Based on the reasoned action approach, the TPB posits that individuals consciously weigh the pros and cons before making decisions, evaluating behavior's importance and consequences (Ajzen, 2012). According to the TPB, behavioral intentions are the most proximal determinant of behavior. An individual's intention to perform a particular behavior is, in turn, predicted by three socio-cognitive factors: attitudes, subjective norms, and perceived behavioral control.

The TPB has been used widely to understand, predict, and change environmental attitudes and behaviors (e.g., Kaiser, Ranney, Hartig, & Bowler, 1999; Staats, 2003), with studies in the environmental domain often expanding the TPB model by including other relevant variables such as norms (e.g., Kaiser & Scheuthle, 2003; Nigbur, Lyons, & Uzzell, 2010). The TPB is the main theoretical framework used in attitude research on recycling behavior (Thøgersen, 1996), and it has been used to predict a range of conservation behaviors including:

- water conservation (Clark & Finley, 2007),
- reducing private car use (Bamberg, Ajzen, & Schmidt, 2001; see also Gärling, Bamberg, & Friman, this volume),
- environmental activism (Fielding, McDonald, & Louis, 2008),
- forest conservation among farmers (Mastragelo, Gavin, Laterra, Linklater, & Milfont, 2014),
- edible gardening (Lake, Milfont, & Gavin, 2012), among others.

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Norm-Activation Theory

According to the norm–activation theory, behavior is a function of a person's assignment of personal responsibility for their actions (i.e., ascription of responsibility) and their understanding that their actions might have consequences for the welfare of others (i.e., awareness of consequences; Schwartz, 1977). The norm–activation theory has been used to explain a wide range of altruistically motivated helping behavior, including environmental protection (Dietz, Fitzgerald, & Shwom, 2005; Heberlein, 1977; Dunlap & Van Liere, 1978). In the environmental domain, ~~environmental attitudes must induce ascribed responsibility that in turn activates a personal norm to perform a proenvironmental behavior~~ (~~cf.~~ Gärling, Fujii, Gärling, & Jakobsson, 2003).

Our reading of the theory suggests that ascription of responsibility and awareness of consequences interact in influencing behavior, a view that has received empirical support across countries (Milfont, Sibley, & Duckitt, 2010; Schultz et al., 2005). Another reading of the theory suggests a mediation model, with awareness of consequences preceding and predicting ascription of responsibility, and has also received empirical support (Steg & de Groot, 2010). Future studies should compare these moderation and mediation approaches within the environmental domain and examine their role in relation to environmental attitudes.

Value-Belief-Norm Theory of Environmentalism

AuQ16   Stern and colleagues (Stern, 2000; Stern, Dietz, Abel, Guagnano, & Kalof, 1999) developed the value-belief-norm theory as an integrative model about the relations between general values, ecological beliefs, components of the norm–activation theory, and behavior. Their model offers a causal chain of six variables: values → ecological worldview → awareness of consequences → ascription of responsibility → personal norm → behavior. Empirical support for the full or partial causal chain has been reported (e.g., Poortinga, Steg, & Vlek, 2004; Hansla, Gamble, Juliusson, & Gärling, 2008). ~~Meta-analytical results reviewed in what follows also support the value–belief–norm theory, but longitudinal test of this mediation model is lacking.~~

It is worth noting that most contemporary work in the environmental domain has attempted to integrate ~~these three previous theoretical models~~ in predicting proenvironmental behavior. This trend has led to substantial empirical data that were meta-analyzed by Bamberg and Möser (2007) and by Klöckner (2013), reviewed in more detail in what follows.

Value-Attitude-Behavior Cognitive Hierarchy Model

The value-belief-norm model described earlier is conceptually similar to an earlier model linking values and behavior via attitudes. This model implies a hierarchy of cognitions in which the influence theoretically flows from more abstract cognitions (i.e., values) to midrange cognitions (i.e., attitudes) to specific behaviors. Homer and Kahle (1988) tested this model for natural food shopping with structural equation analysis. Their findings indicated that attitude toward natural food fully mediated the influence of values on the purchase of natural food.

Other studies have provided empirical support for this model. For example, Vaske and Donnelly (1999) found that wildland preservation attitudes fully mediated the relationship between biocentric/anthropocentric value orientations and wildland preservation voting intention. Milfont et al. (2010) examined the model across samples from Brazil, New Zealand, and South Africa and found that environmental attitudes fully mediated the influence of values (and perceived environmental threat) on proenvironmental behavior. Future work should add intention to this model to test the following causal chain: values → environmental attitudes → behavioral intention → behavior.

The Inclusion Model of Environmental Concern

The inclusion model for environmental concern builds on the value–belief–norm theory. Schultz (2000) argues that concern for environmental issues is linked to the degree to which people view themselves as part of the natural environment. Individuals with a strong level of connectedness are more likely to hold biospheric environmental concerns, whereas individuals with low levels of connectedness are likely to hold more egoistic concerns. Importantly, both egoistic and biospheric concerns can lead to proenvironmental behavior, depending on the costs and benefits of the action. Individuals with egotistically based environmental concerns are focused on the benefits that can accrue to themselves for acting in ways that protect the environment, whereas individuals with biospheric concerns are more interested in the positive benefits for others, including animals and plants. A graphic representation of the Inclusion Model is shown in Figure 11.1.

The concept of "inclusion" refers to the degree to which individuals include nature within their cognitive representations of self (Nolan & Schultz, 2015). Individuals with egoistic concerns can still be worried about the harmful consequences of environmental problems, and they can be motivated to take action, but only when these actions have a positive benefit to themselves. In contrast, individuals with biospheric concerns are more inclusive, and their concerns extend to other people, future generations, and even to plants and animals. Importantly, biospheric concerns are inclusive of self–interest, such that biospherically motivated individuals will engage in proenvironmental behavior both when there are personal benefits to doing so *and* when there are no personal benefits.

Support for this model comes from several lines of research. First, studies have shown that connectedness with nature is positively associated with biospheric environmental concerns and negatively associated with egoistic environmental concerns. This has been found for both implicit (Schultz et al., 2004, 2007) and explicit (Schultz, 2001) measures of connectedness with nature. Second, a series of experiments by DeDominicis, Schultz, and Bonaiuto (2017) showed that individuals with egoistic environmental concerns were more likely to engage in a proenvironmental behavior when there were direct benefits to self than when there were not. In this experiment, participants were classified as either egoistically or biospherically concerned and then offered the opportunity to spend a morning volunteering for a beach cleanup. When a $25 incentive was offered and the event was presented as "fun" and included a free lunch for those who volunteered, egoistically motivated participants were more likely to volunteer (and to show up!) than when the same event was described in terms
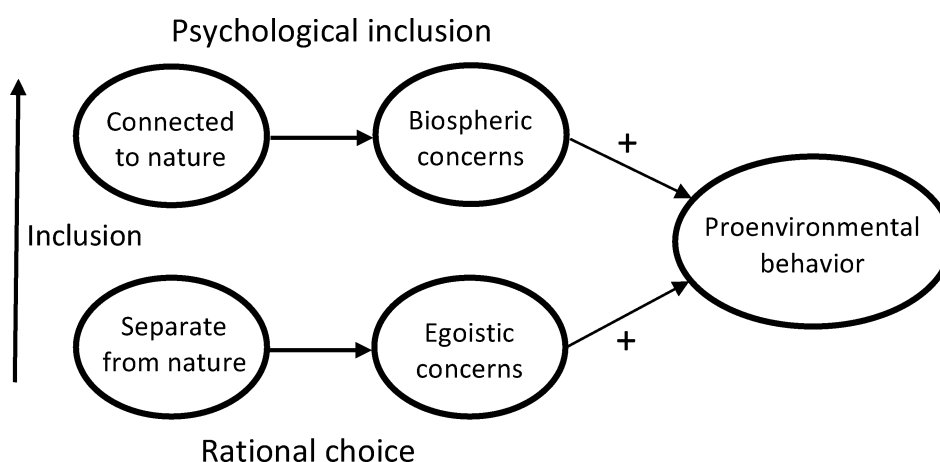

Figure 11.1   The Inclusion Model of Environmental Concern

of the environmental benefits to local animals and habitats. However, in line with predictions from the inclusion model, participants in the experiment who were biospherically motivated were equally likely to volunteer in the incentivized and nonincentivized experimental conditions. And when the incentive was offered, egoistically and biospherically motivated individuals did not differ in their level of involvement.

Social Norms

Individuals' attitudes are influenced by perceptions of the beliefs and behaviors of others ~~in their social group~~. A growing number of studies has examined the impact of social norms on proenviron-mental attitudes and behavior (e.g., Schultz, Nolan, Cialdini, Goldstein, & Griskevicius, 2007, 2018). Overall, results have shown that descriptive norms (beliefs about what other people typically do) and injunctive norms (beliefs about what other people approve or disapprove of) can strongly influence proenvironmental attitudes and behaviors ~~even when individuals are not aware of the influence of normative social influence on their actions~~ (Nolan, Schultz, Cialdini, Goldstein, & Griskevicius, 2008). Smith and colleagues (2012, Study 2) conducted an experiment in the UK and China and showed that aligning supportive descriptive and injunctive norms produces the strongest proenvironmental intentions. These results support the view that individuals abide by societal norms when deciding to perform proenvironmental behaviors.

Studies in hotel settings provide interesting applications of this line of research (Goldstein, Cialdini, & Griskevicius, 2008; Goldstein, Griskevicius, & Cialdini, 2007; Schultz, Khazian, & Zaleski, 2008). These studies have applied principles of normative social influence to encourage guests to reuse their towels. Compared to standard environmental pleas asking guests to reuse their towels to help protect the environment, the inclusion of normative messages (e.g., "nearly 75% of hotel guests choose to reuse their towels each day") increased towel reuse.

Drawing from research on normative social influence, the American company OPOWER (www.opower.com; recently acquired by Oracle) delivers an energy-efficiency program with the goal of reducing household energy consumption. Households that subscribe to the program can access their energy usage statistics using interactive computer software that draws on normative information. A client's energy usage is compared to their "energy-efficient" neighbors (descrip-tive normative information), and this information is coupled with injunctive normative informa-tion (provided in the form of an emoticon or smiley face) that differs depending on their energy usage. While OPOWER might be seen as working against utility companies, in reality it attempts to assist electricity companies to meet their efficiency goals. Independent analyses of this program by Hunt Allcott and colleagues indicate it has long-term effectiveness and achieves an average reduction in energy consumption of 2% (Allcott, 2011; Allcott & Mullainathan, 2010; Allcott & Rogers, 2014).

Further support for the usefulness of normative social influence on proenvironmental behavior is given by a meta-analysis by Abrahamse and Steg (2013). These authors reviewed 29 studies that utilized social influence approaches to encourage resource conservation. Results revealed that a social influence approach was more effective in encouraging resource conservation when compared to a control group (no intervention), Hedge's g = .35 (95% CI [0.20, 0.50]). Sixteen studies allowed com-parison between a social influence approach and another intervention (e.g., information, goal setting, and individual feedback), and results indicate social influence approaches are superior to other inter-ventions in encouraging resource conservation, Hedge's g = .22 (95% CI [0.08, 0.36]).

An increasing number of studies has provided support for the usefulness of social normative mes-sages in fostering proenvironmental behaviors. It is still unclear, however, whether the increase in such behaviors resulting from normative interventions also result in changes in environmental attitudes. Future research should explore this possibility.

Affective and Emotional Processes

The theoretical models described earlier tend to focus on rational/cognitive approaches. Although there is no single theoretical model linking affect/emotions and environmental attitudes, scholars have emphasized ~~their importance~~. We provide a summary below and encourage future work on this domain.

The measure of environmental attitudes developed by Maloney and colleagues (Maloney & Ward, 1973; Maloney, Ward, & Braucht, 1975) includes the affect subscale assessing emotional aspects, with items such as "It frightens me to think that much of the food I eat is contaminated with pesticides," "I'm usually not bothered by so-called 'noise pollution'" (reversed), and "When I think of the ways industries are polluting, I get frustrated and angry." Kellert (1996) developed a typology of basic human attitudes toward nature, and one of the attitude types (*humanitarian*) describes strong affection, emotional attachment, and "love" for nature.

More recently, Kaiser, Schultz, Berenguer, Corral-Verdugo, and Tankha (2008) extended the TPB by including anticipated guilt and embarrassment in the model; although the inclusion of these two emotional responses did not increase the explanatory power of the TPB, anticipated guilt and embarrassment were significant predictors of proenvironmental intentions. In their meta-analysis, Bamberg and Möser (2007) reported that guilt was strongly associated with environmental attitudes (.48 [CI .18 .70]). Onwezen, Bartels, and Antonides (2014) showed that anticipated pride and guilt mediate the attitude–intention relation in purchase of organic products in both individualist and collectivist societies. Coelho, Gouveia, Souza, Milfont, and Barros (2016) showed that emotions toward water wastage were positively related to Preservation attitudes and water conservation behavior and discriminated participants who were interested in taking action to conserve water. Finally, Kals, Schumacher, and Montada (1999) proposed the concept of "emotional affinity with nature" and showed it mediated the effect of experiences in nature and proenvironmental behavior.

Amerigo, Aragonés, and García (2012) have proposed a model that tries to integrate affective and cognitive constructs from the environmental concern literature based on ~~their position~~ on a gradient measuring the inclusion of nature in the self. The four constructs are environmental apathy, anthropocentrism, emotional affinity, and connectedness. The first two index lesser inclusion of nature in self and the last two greater inclusion. While apathy and emotional affinity are affective constructs, anthropocentrism and connectedness are cognitive constructs. Confirming predictions, their findings ~~with a sample of university students ($N = 514$)~~ showed that apathy and anthropocentrism were negatively associated with measures of inclusion of nature in self and proenvironmental intentions, and emotional affinity and connectedness were positively associated with these measures. Combining affective and cognitive aspects in the measurement of environmental attitudes (see, e.g., Maloney et al., 1975; Milfont & Duckitt, 2010) as well as in their prediction might prove a fruitful avenue for future research.

The Influence of Environmental Attitudes on Intentions and Behavior

Given the definitions and theoretical models summarized earlier, it should come as no surprise that attitudes are likely to influence attitude-relevant behavior. This has been an active area of research for many years, and while there is ~~considerably~~ variability in the relationship between ~~environmental~~ attitudes and behavior, ~~in aggregated~~ the two are positively correlated. ~~A meta-analysis by Hines et al. (1987) reported a mean correlation of .37 (nine studies) between environmental attitudes and proenvironmental behavior.~~

Other meta-analyses have shown similar results. For example, Bamberg and Möser (2007) reported a correlation of .42 (17 studies, [CI .26 .56]), Milfont (2012c) reported a correlation of .48 (5 studies, [CI .42 .54]), and Klöckner (2013) a correlation of .36 (30 studies, [CI .28 .43]). In their meta-analysis

of 474 social psychology effects, Richard, Bond, and Stokes-Zoota (2003) concluded that effects typically yielded a value of .21 and that 30.44% yielded a correlation of .10 or less. The effect sizes for the association between environmental attitudes and proenvironmental behavior are larger than those found in social psychology.

Examination of available meta-analyses in the environmental domain also provide evidence of other predictors of proenvironmental behavior besides environmental attitudes. For example, Hines et al.'s (1987) meta-analysis showed that environmental attitudes were the third most important variable associated with proenvironmental behavior after verbal commitment and locus of control.

In their meta-analytical structural equation model, Bamberg and Möser (2007) found that perceived behavioral control had the strongest effect on behavioral intention (.31) and that attitude and moral norms had equal effects (.29). Additional analyses showed that intention fully mediated the relationship of these three constructs on behavior and had a strong effect on it (.52). Attitude predictors were social norms, feelings of guilt (.27 for both), and internal attribution (.13). Examination of the pooled correlation shows that attitude was the construct with the strongest correlation with intention .62 [CI .52 .70] and that the strongest correlation among the constructs reported was between attitude and moral norm .67 [CI .43 .82].

Klöckner (2013) reports results from a meta-analytical structural equation model examining predictors of proenvironmental behavior. Both attitudes and perceived behavioral control had equal effect on intention (.30)—the only other intention predictors were personal and social norms (.22 and .15, respectively). While intention fully mediated the attitude effect on behavior, perceived behavioral control also had a direct (albeit small) effect on behavior (.11). Examination of the pooled correlation shows that attitude was the construct with the strongest correlation with intention, .62 [CI .55 .69]. The strongest correlation among the constructs reported was between attitude and personal norm, .64 [CI .41 .79]. Indeed, the overlap between attitude and personal norm was so substantial that a covariance between attitudes and the residual of personal norms had to be included to yield a good-fitting model in meta-analytical structural equation modelling.

These results support the importance of attitudes in predicting behavioral intention as well as the role of intention as the route by which attitude (and other constructs) influence proenvironmental behaviors.

Interventions to Change Environmental Attitudes

Research examining ways to foster environmental attitudes and/or behavior has focused on educational interventions—but see the section on interventions using normative social influence. In their critical review of 34 studies aimed at changing environmentally relevant knowledge, attitudes, and behavior, Leeming and colleagues (1993) found that most studies investigated the effects of educational interventions on knowledge or attitudes, but the empirical evidence of their effectiveness was uncertain.

In a more positive conclusion, Zelezny (1999) reported a meta-analysis specifically examining the effectiveness of 18 educational interventions to improve proenvironmental behavior. Overall, the findings indicate that educational interventions were more effective when conducted in the classroom than in other settings, when they involved participants actively, and when younger participants took part. However, most of the reviewed interventions (89%) did not measure observed proenvironmental behavior, which limits the effectiveness of the educational interventions to self-reported behaviors only. Moreover, it is uncertain whether any change in proenvironmental behavior (self-reported or actual) has any implications in changing environmental attitudes of the participants.

Visiting natural environments may function as an educational intervention affecting environmental attitudes. Noted earlier in relation to implicit measures, the work by Schultz and Tabanico (2007, Study 3) illustrates this possibility. They assessed implicit connection with nature for 75 visitors at the

entry of the San Diego Wild Animal Park and for 56 visitors at the exit. Results showed that visitors who were exiting the park scored significantly higher on the IAT-Nature than visitors who were arriving.

Finally, scholars have examined the influence of contact with nature during childhood in shaping environmental attitudes in adulthood. For example, Kals et al. (1999) found that time spent in nature between the ages of 7 and 12 strongly predicted emotional affinity toward nature, which in turn predicted proenvironmental behaviors. Interview studies with individuals with high levels of environmental attitudes and engagement indicate that their early experiences in nature were influential in their present-day involvement in environmental actions (e.g., Arnold, Cohen, & Warner, 2009; James, Bixler, & Vadala, 2010). These studies support the important role of childhood experiences in nature in forming subsequent environmental attitudes and behaviors. Intervention programs that increase exposure to nature in formative years might thus lead to subsequent environmentalism.

New Directions in Environmental Attitudes Research

Cultural Differences/Similarities and Contextual Influences

Given the unequaled scale and impact of global environmental problems, there is a growing need to understand human–environment interactions from a cross-cultural perspective (Milfont, 2012a; Milfont & Schultz, 2016; Schultz, 2002) and within a multilevel analytic framework (Milfont & Markowitz, 2016). We believe these are important new directions in environmental attitudes research.

Studies have shown that the levels of environmental attitudes differ for distinct cultural groups (e.g., Milfont et al., 2006; Schultz, 2002). To illustrate, Cowie, Greaves, Milfont, Houkamau, and Sibley (2016) compared endorsement of environmental values ("Protecting the environment [preserving nature]") among respondents who identified with distinct cultural groups in New Zealand: Māori (the indigenous peoples), New Zealand European, Pasifika (individuals from Pacific Nations), and Asian. Māori value environmental protection more strongly than both New Zealand Europeans and Pasifika, whereas Asian respondents do not. These authors then investigated what particular dimensions of Māori identity drive higher environmental values among a subsample of Māori participants. The extent to which Māori participants recognize the importance of and stand up for Māori political rights was related to environmental values.

There is a growing appreciation for the role of context in shaping both environmental attitudes and behaviors (see Stern et al., 1995; Milfont & Markowitz, 2016), and an increasing number of studies in the environmental domain have used multilevel research designs to unravel factors influencing behavior at distinct levels. To illustrate, Derksen and Gartell (1993) noted that "[t]he most important determinant of recycling behavior is access to a structured, institutionalized program that makes recycling easy and convenient" (p. 439).

In their observational study of littering behavior across public locations in 10 states of the United States, Schultz and colleagues (2013) found that individuals were more likely to litter in settings with existing litter, and they were less likely to litter in sites with available trash receptacles. Another study examining data across regions in the United States showed that residential energy consumption was greater in households in colder regions, single-family detached houses, larger households, and those that need to use heating or cooling systems (Tso & Guan, 2014). Another study examined individual, organizational, and collective factors that might influence recycling behavior in 55 towns in Córdoba, Spain (Tabernero, Hernández, Cuadrado, Luque, & Pereira, 2015). Higher levels of recycling were observed for participants with greater self-efficacy and greater satisfaction with the quality of the recycling service. Importantly, there was a reliable cross-level interaction between the three levels of

analysis. Individuals living in communities with high satisfaction with service quality and high community recycling rates showed higher levels of recycling than individuals living in communities with lower levels of satisfaction and community recycling rates.

Recent work has also begun to integrate a cross-cultural *and* multilevel approach to identify interactions between the levels of analysis. Milfont and Markowitz (2016) reviewed this emerging literature and used data from the World Values Survey ($N = 73,117$, $k = 57$) to test a cross-level interaction. They found that the associations between altruistic and biospheric values and environmental protection were stronger for respondents in countries with higher levels in the Human Development Index—a composite statistic of three key dimensions of human development: a long and healthy life (*life expectancy*), being knowledgeable (*education*), and have a decent standard of living (*per-capita income indicators*). Also using data from the World Values Survey ($N = 67,268$, $k = 48$), Eom, Kim, Sherman, and Ishii (2016) showed that the association between environmental concern and willingness to pay to protect the environment was stronger for respondents in countries with higher levels of individualism. In their 24-country study, Bain and colleagues (2016) also found that the association between perceived importance of climate change and proenvironmental intentions was stronger for respondents in countries with higher scores in the Human Development Index. Along these same lines, a meta-analysis showed that the associations between both attitude and intention and intention and behavior in the environmental domain were stronger in countries with higher levels in the Human Development Index and with higher levels of individualism (Morren & Grinstein, 2016).

Environmental Attitudes Within the Campbell Paradigm

While traditional approaches to attitude measurement and research have dominated the field since its inception nearly 50 years ago, Kaiser and colleagues have proposed a new approach for measuring environmental attitudes. They call this new approach the Campbell paradigm (Kaiser, Byrka, & Hartig, 2010) because it draws from Campbell's (1963) notion that attitudes can be inferred from a person's behavioral records. Kaiser and colleagues posit that the probability that a person will engage in a proenvironmental behavior is a function of the person's proenvironmental attitudes and the difficulty of the behavior. Practically, they use the Rasch model to derive a person's general attitudes from their attitude-relevant behavior and argue the Campbell paradigm can overcome the so-called hypocrisy in attitudes research (Kaiser & Byrka, 2015)—this hypocrisy refers to an inconsistency between general attitudes and specific behavior (Ajzen & Fishbein, 2005).

Kaiser and colleagues claim that their Campbell-paradigm approach to environmental attitudes is in opposition to the conventional wisdom in attitude research that focuses on an individual's personal evaluations (e.g., Kaiser, Oerke, & Bogner, 2007). It is important to highlight a few theoretical and empirical issues regarding this claim. Theoretically, contemporary and evaluative definitions conceptualize affective, cognitive, and behavioral information as the bases for attitudes. The focus on traceable behavioral records as indicative of one's attitudes does not contradict the evaluative characteristic of attitudes. Empirically, their own data indicates substantial overlap between their behavior-based attitude measure and other proenvironmental behavior measures using traditional approaches and a measure based on evaluative statements capturing Preservation attitudes. In their words, "it seems fair to conclude that our novel attitude scale largely overlaps with traditionally composed conservation behavior measures," and "Preservation largely correlates with our behavior-based attitude measure ($N = 865$: $r = .58$ and .72 corrected for measurement error attenuation)" (Kaiser et al., 2007, p. 249).

These considerations indicate that the Campbell paradigm for measuring environmental attitudes overlaps conceptually and empirically with the evaluative and traditional approach to attitudes research. Future work should explore these considerations further (see also Ajzen, Fishbein, Lohmann, & Albarracín, this volume).

Future Directions in Environmental Attitudes Research

Given the increasing importance of environmental problems worldwide, research on environmental attitudes and behaviors is likely to continue to attract considerable interest. While a solid foundation has been established, there are a number of promising and unexplored lines of work. Here we highlight just a couple.

One potential line of research that has yet to be explored is the application of the MODE model to the environmental domain. First proposed in 1990, this model considers *M*otivation and *O*pportunity as the major *DE*terminants of spontaneous or deliberative attitude-to-behavior processes (Fazio, 1990). In particular, the MODE model can be useful to understand the interplay of more spontaneous and more deliberative processes in the relations between environmental attitudes and behavior (Fazio & Olson, 2014). This model suggests that automatically activated environmental attitudes should predict environment-relevant behavior in the absence of motivation or opportunity. Perhaps more pertinent to the environmental domain are situations in which individuals need to weight the costs and benefits of acting on proenvironmental alternatives. Here deliberatively activated environmental attitudes should predict behavior if the individual ~~both~~ is motivated to engage in the cognitive effort to make a decision and has the opportunity to do so. Empirical examinations of such predictions from the MODE model to the environmental domain are lacking.

Future work in the environmental domain should also examined the association between attitudes and behaviors with distinct frequency. There are environment-relevant behaviors that could be performed daily (e.g., recycling, eating a meat-free diet, using public transport for commuting), while others are performed much less frequently (e.g., purchasing an electric car, installing appliances that reduce water/electricity consumption). Interestingly, in his meta-analytical review Klöckner (2013) reported no differences in the intention–behavior link for low-frequency and high-frequency behaviors. However, we believe future work should explore further whether attitudes and intentions are more predictive of repetitive proenvironmental behaviors than low-frequency behavior since repetitive behaviors are likely more habitual and have lower barriers/costs for implementation.

Conclusions

This chapter has provided an overview of research in the area of environmental attitudes and proenvironmental engagement. We defined environmental attitudes as *evaluative beliefs, affect, and/or behavioral intentions about environmentally related activities or issues*. Following this definition, we summarized several of the measurement strategies developed to measure environmental attitudes, including explicit self-report measures such as the New Ecological Paradigm and the Environmental Attitudes Inventory, and implicit measures such as the Implicit Association Test. We also differentiate between measures of general attitudes and more focused attitudes toward specific issues or programs. Also in the area of measurement, we review research on the dimensionality of environmental attitudes, most specifically ~~attitudes of Utilization and Preservation~~.

While studies of environmental attitudes have often taken an applied perspective, the work is guided by several prominent theoretical models. In some instances, these theoretical models have been adopted from more general social psychological models, such as the theory of planned behavior, norm activation theory, the value-attitude-behavior cognitive hierarchy, and social norms. But some theoretical models used to understand environmental attitudes have been developed specifically in this area, including the value-belief-norm theory and the inclusion model of environmental concern. ~~Interestingly, each of the theoretical models reviewed in this chapter contains both attitudes *and* behavior, and they help guide our understanding of when attitudes will predict behavior.~~ Like other areas of attitudes research, studies have shown that attitudes are correlated with behavior, but the

relationship is not straightforward, and the relationship between attitudes and action is influenced by a number of variables including context, culture, and measurement issues.

Finally, the chapter provided a quick glimpse into the research focused on changing environmental attitudes. Studies in this area have tested a number of specific attitude-change strategies, many of which are summarized in more details in other chapters in this volume. But critically for efforts to promote a more environmentally sustainable future, studies have shown that attitudes can change, and educational activities and nature experiences can cultivate attitudes of concern for environmental issues, beliefs about the importance of environmental protection, and behavioral intentions to protect the environment. These findings provide hope for a more sustainable future and illustrate the role of attitudes in understanding and responding to environmental issues.

Acknowledgments

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