

Emerging Issues and Trends in the Measurement of Environmental Attitudes

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Abstract: This study provides readers with a definition of Environmental Attitudes (EA) and methods/strategies of measuring EA. It also discussed the types of pro-environmental behavior and strategies that help individuals to harmonize and reconcile their seemingly incongruent behaviours. It also discussed the structure of EA and a brief definition of many of the well-established measures of EA as well as some guidelines in selecting and using an appropriate measure. In summary, direct self-report techniques such as scales and inventories are the most widely used methods for measuring EA. There are several scales measuring EA but with no accepted gold standard measure in the literature. Moreover, the EA measures available are inadequate for measuring the overall structure of EA.

Key words: Environmental attitudes, measure, behaviour, strategies, reconcile, self-report, literature

INTRODUCTION

The word “environment” typically refers to both built and non-human environments. Hence, using this all-encompassing definition, Environmental Attitudes (EA) may refer to attitudes toward all external objects of one’s reality (Milfont, 2012). EA have been described as “the collection of beliefs, affect and behavioral intentions a person holds regarding environmentally related activities or issues”. It is also people’s orientations toward environmentally related objects, including environmental problems and problem-solving actions and divided into three types: cognitive, affective and evaluative environmental orientations (Schultz *et al.*, 2004). According to Gallagher environmental attitudes are perceptions of or beliefs regarding the physical environment including factors affecting its quality (e.g., overpopulation, pollution). In contrast, environmental concern has been defined as “the degree to which people are aware of problems regarding the environment and support efforts to solve them and indicate a willingness to contribute personally to their solution” (Dunlap and Michelson, 2002) or as “the affect (i.e., worry) associated with beliefs about environmental problems” (Schultz *et al.*, 2004). Despite these multiple and distinct definitions, EA and environmental concern are often used interchangeably. Since, environmental concern is now generally, considered to be one aspect of EA (Bamberg, 2003) and “environmental attitudes” is also the psychological index term frequently used, Gallagher and Milfont (2007, 2012) defined environmental attitudes as

psychological tendency to evaluate the natural and built environments and factors affecting their quality with some degree of favor or disfavor. When measuring EA, the underlying goal is to identify individual’s perceptions and beliefs regarding the environment how these perceptions and beliefs can be operationalized in terms of dimensions (or more specific psychological constructs) and how these dimensions can be measured by means of survey questionnaires or other methods.

Environmental attitudes are important because they often but not always, determine behavior that either increases or decreases environmental quality. Traditionally, attitudes have cognitive, affective and conative elements. Pro-environmental attitudes rise and fall with current events and vary with age, gender, income, employment, socioeconomic status, nation, urban-rural residence, religion, politics, values, personality, experience, education and environmental knowledge (Lovelock 2010, Diamantopoulos *et al.*, 2003). Environmental concern appears to be negatively related to age and to right-wing authoritarianism and positively to education and liberalism (Dunlap and Jones, 2003): the young, well-educated and politically liberal adults are more pro-environmental than their counterparts. Past residence also seems important: people brought up in urban areas score higher on the environmental concern measures (Dunlap *et al.*, 1982). According to Diamantopoulos *et al.* (2003) those aged between 30 and 39 years are more likely to have a pro-ecological worldview while those aged 60 years and over are more likely to have an anti-ecological worldview. The impact of

education on environmental attitudes has been investigated in a large number of studies and most studies have found that those who have attained higher educational qualifications score higher on all environmental themes (Diamantopoulos *et al.*, 2003). They suggest that:

“The higher-educated understand the issues involved more fully and hence are more concerned about environmental quality and more motivated to participate in environmentally responsible behaviors (Diamantopolous *et al.*, 2003)”

Despite males being found to have a greater level of environmental knowledge than females, females generally have been found to exhibit higher levels of environmentally conscious attitudes and behaviour (Diamantopolous *et al.*, 2003). When they tested this finding by surveying British customers, they also found that females hold stronger environmental attitudes than males (Diamantopolous *et al.*, 2003). In general, urban or metropolitan residents are often significantly more environmentally concerned than rural residents. Bruni *et al.* (2012) suggest that a reason for this difference is that “urban residents are more exposed to signs of environmental deterioration such as air pollution”.

Two prominent theories for explaining environmental attitude-behavior relations are the theory of planned behavior and value-beliefs-norm theory which offer the benefit of parsimony and the shortcoming of incompleteness. Researchers have for example, suggested additions to the theory of planned behavior, noting that pro-environmental behaviors vary in their effort to complete which influences the attitude-behavior relation and that many barriers to behavior change exist.

Types of proenvironmental behaviour: Stern (2000) differentiates three main types of proenvironmental behavior: pro-environmental activism (e.g., active involvement in environmental organizations and demonstrations), nonactivist behaviors in the public sphere (e.g., petitioning on environmental issues, joining or contributing to environmental organizations and supporting public policies) and private-sphere environmentalism. Because of its immediate impact on the environment it is useful to further subdivide these private-sphere behaviors according to the type of decision they involve: the purchase of major household goods and services (e.g., cars, houses), the use and maintenance of environmentally important goods (e.g., heating and cooling systems), household waste disposal (e.g., composting) and ‘green’ consumerism (e.g., purchasing organic food).

There is the assumption that all these behavioral types reflect one common latent pro-environmental behavioral tendency, researchers for a long time expected a positive correlation between these different types of pro-environmental behavior. However, empirical research does not support this assumption. For example, Krosnick and Fabrigar (2006) found only weak, sometimes even negative, correlations between different pro-environmental consumer activities. He concludes that there is no ‘general’ pro-environmental behavior: a person can behave very proenvironmentally in one behavioral domain (e.g., recycling) and very environmentally damaging in another (e.g., mobility).

Bamberg and Moser (2007) identified cognitive strategies that help individuals to harmonize and reconcile their seemingly incongruent behaviors. These strategies are called ‘attention-shifting strategy’ and ‘low-cost strategy’. In attention shifting, people tend to emphasize the importance of some activities while simultaneously playing down the importance of other activities. In low-cost proenvironmental behaviors tend to be consonant with each other where the cost of pro-environment behavior is low.

Measuring private-sphere environmentalism-the intent-oriented approach: Typically, intent-oriented private-sphere environmentalism measures incorporate behaviors that are seen as prototypical indicators of a person’s latent motivation to act in a proenvironmental way. Respondents are provided with a list of such behaviors and asked to indicate how often (e.g., on a scale ranging from ‘never’ to ‘always’) they perform each of these behaviors. While some studies focus on one specific behavior such as recycling, others deploy scales that combine different types of behavior.

The intent-oriented approach of the measuring pro-environmental behavior has been criticized mainly for two reasons. One critical point is that it relies on self-reported behavior which may not be an accurate measure of actual behavior. Self-reported behavior tends to reflect people’s perceptions or beliefs about their behavior, at least to some degree. There are factors that may result in inaccurate reports of actual behavior such as lack of knowledge, social desirability and other types of (conscious or unconscious) response bias. For example, in Bogner (2002) survey, 24% of the participants reported that they always or often bought organically produced food. But at that time the share of organically produced food on the total food production in Germany was only about 2% which questions the reliability and validity of participant’s self-reported ecobehavior. Another critique (Stern, 2000) relates to the way scales of pro-environmental behavior are usually constructed. Intent-oriented scales often include behaviors (e.g.,

refusing plastic bags in shops or buying recycled paper) that do not reflect the actual environmental impact of persons or households. As a consequence, respondents reporting a large number of these insignificant actions often receive a high total pro-environmental score, although such actions may only have a marginally positive impact on the environment.

MATERIALS AND METHODS

Measuring private-sphere environmentalism-the impact-oriented approach: The impact-oriented approach is based on an analysis of the actual environmental load of household consumption activities mainly in energy and greenhouse gas emission terms. The aim of these analyses is to both calculate average per capita energy use or CO₂ emissions and identify the consumption activities most significantly contributing to this total amount. The activities that most strongly affect a household's total CO₂ emissions are transportation-distances traveled by car and plane and housing-size of living area and insulation standard. Food consumption also has a significant impact on CO₂ emissions, in particular the quantity of meat consumed and the purchase of organically produced food. Based on these analyses, impact-oriented survey questionnaires cover the consumption activities (purchase and use) most relevant for a household's total CO₂ emissions.

One clear disadvantage of the impact-oriented approach is its high complexity. The information needed for calculating a household's total energy consumption requires elaborate and detailed questionnaires. Sometimes, people cannot supply the requested information. For example, many people are not able to report their annual consumption of natural gas in cubic meters or electricity in kilowatt-hour. The same is true for the reporting of travel and nutrition habits.

Structure of environmental attitudes: Researchers have postulated that EA have cognitive, affective and behavioural components. Milfont (2012) specifically argues that people's perception and awareness, feelings or emotional responses and judgments or opinions about environmental problems refer to the cognitive, affective and evaluative environmental orientations, respectively. According to this framework, the structure of EA can be characterized by its horizontal and vertical structure. In psychometric terms, the horizontal structure refers to the primary order or first-order factors forming the structure of EA while the vertical structure refers to the higher order factors.

The horizontal structure, thus, refers to the dimensionality of EA. The issue here is whether EA are inherently multidimensional or whether it is legitimate to treat EA as a unidimensional construct (Dunlap and Jones, 2002). Although, several researchers still consider EA as a unidimensional construct in their studies there seems to be a consensus in the literature that EA are a multidimensional construct (Schultz, 2001). It is still not clear, however, how many dimensions form the horizontal structure of EA.

Fewer studies have examined the vertical structure of EA. These studies have argued for either a single higher order EA factor structure (Xiao and Dunlap, 2007) or for a two higher order EA factors structure (Milfont and Duckitt, 2004; Wiseman and Bogner, 2003). The single general factor has been the traditional view in the literature in which a single higher order dimension consists of tightly co-varying domains. Bamberg (2003) expressed this view, for example, when pointing to an underlying fundamental orientation to which all environmental beliefs are jointly connected.

However, recent studies have suggested a structure with two higher order factors with preservation and utilization forming the vertical structure of EA (Milfont and Duckitt, 2004, 2010; Milfont and Gouveia, 2006; Wiseman and Bogner, 2003). Preservation expresses the general belief that priority should be given to preserving nature and the diversity of natural species in its original natural state and protecting it from human use and alteration. Utilization, in contrast, expresses the general belief that it is right, appropriate and necessary for nature and all natural phenomena and species to be used and altered for human objectives. The distinction between two such higher order EA factors is articulated in a number of theories (Milfont, 2007). For example, preservation and utilization are related, respectively to the spiritual and the instrumental views of people-environment relations (McIntyre and Milfont, 2016) and to the distinction between moral/altruistic and utilitarian values (Kaiser and Scheuthle, 2003). Based on these recent developments in the field, it is assumed, here, that EA are a multidimensional construct that Milfont, Duckitt, *Journal of environmental psychology* 30 (2010) 80-94 81 can be-organized in a hierarchical fashion with two higher order dimensions (i.e., preservation and utilization).

RESULTS AND DISCUSSION

Measuring environmental attitudes: Attitudes are a latent construct and as such cannot be observed directly. Thus, rather than being measured directly, attitudes

have to be inferred from overt responses (Krosnick *et al.*, 2005). Studies measuring EA have generally used direct self-report methods (e.g., interviews and questionnaires) and much less frequently implicit techniques (e.g., observation, priming and response competition measures). Two dominant strategies for assessing environmentally relevant behaviors are the intent and impact-oriented measurement approaches. EA are typically measured using direct self-report methods such as interviews and questionnaires (i.e., explicit measures). Less frequently, implicit measures and techniques are used, such as unobtrusive behavioral observations, physiological measures and response latency measures (Corral-Verdugo, 1997 and Schultz *et al.*, 2004, 2013). For instance, Corral-Verdugo (1997) used self-report and unobtrusive observation to measure re-use and recycling behaviour. He found a low correspondence between the reported and observed re-use/ recycling behaviour which indicates that self-reports are not completely reliable measures of actual behaviours. In another study, Van Vugt and Samuelson (1999) study 2 used scenarios priming the severity of water shortage to study the effect of individual water metering on conservation intention. They found that willingness to conserve was higher when a water shortage seemed severe and when water use was known to be metered. Schultz *et al.* (2004); Schultz and Tabanico (2007) conducted a study using implicit EA measure. They used the implicit association test (Hawcroft and Milfont, 2010) to measure people's connection with nature by using two target concepts (i.e., Nature and Built) and two attribute dimensions (i.e., Me and Not me). Participants were asked to match an item with the appropriate category in each of ten specific trials. They found that participants tended to associate themselves more easily with nature than with built environments and that this implicit measure of connectedness with nature correlated with self-report explicit measures of EA.

The intent-oriented approach uses the actor's standpoint for defining proenvironmental behavior. An action is viewed as proenvironmental behavior if it is taken with the intention to benefit the environment. The intent-oriented approach stresses an actor's subjective motivation as a defining characteristic of pro-environmental behavior. In contrast, the impact-oriented approach associates all human activities with more or less negative environmental impact (e.g., energy and water use, waste production). As a consequence, the question is not whether a specific human action is 'pro-environmental' by intent but how serious its objective environmental impact is. Thus, impact-oriented measures seek to identify target

behaviors that significantly influence the environment and examine how the environmental impact of behavior patterns can be reduced.

At present, there is no one ideal measure of EA. Due to the lack of consistency in methodological practices or systematic knowledge-building approaches in place when measuring EA, it has resulted in the creation of a vast number of EA measures with over 700 reported in the literature (for a review, Dunlap and Jones, 2002). In an attempt to provide some integration of the existing measures, Dunlap and Jones (2002) have proposed a four-fold typology of EA measures. They suggest measures to be categorized based on the number of environmental issues addressed (e.g., air pollution, climate change, population growth) and number of expressions measured (e.g., beliefs, concern, attitudes, intentions and behaviors related to environmental issues). Despite the existence of hundreds of EA measures, no "gold standard" measure has emerged. Additionally, only a few measures have been consistently and widely used and many have not had their psychometric properties adequately assessed, so that, they may be used with confidence (Dunlap and Jones, 2003).

Despite the large number of environmental attitude measures, only three have been widely used and had their validity and reliability assessed (Dunlap and Jones, 2003; McIntyre and Milfont, 2016). These are:

- The ecology scale
- The environmental concern scale
- The New Environmental Paradigm (NEP) scale (Dunlap *et al.*, 1982)

These three scales examine multiple phenomena or expressions of concern, such as beliefs, attitudes, intentions and behaviours and they also examine concerns about various environmental topics, such as pollution and natural resources. Hence, according to Dunlap and Jones (2002) typology, these measures are all multiple-topic/multiple-expression assessment techniques. Although, widely used both the ecology scale and the environmental concern scale include items tapping specific environmental topics that have become dated as new issues emerge (Dunlap and Jones, 2002, 2003). The NEP scale avoids this issue by using only general environmental topics that do not become dated and measuring the overall relationship between humans and the environment. The NEP scale measures an ecocentric system of beliefs (i.e., humans as just one component of nature) as opposed to an anthropocentric system of beliefs (i.e., humans as independent from and superior to, other organisms in nature) (Bechtel *et al.*,

2006; Dunlap *et al.*, 1982) and is the most widely used measure to investigate environmental issues (Hawcroft and Milfont, 2010).

Moreover, the environmental attitudes measures available are inadequate for measuring the overall structure of environmental attitudes. Although, there seems to be a consensus that EA structure is multidimensional and organized in a hierarchical fashion, no previous measure has previously attempted to assess the overall structure of EA, hence, the need for a new one. The Environmental Attitudes Inventory (EAI) conducted in New Zealand was developed to address this gap by directly measuring both the horizontal and vertical structure of EA. The EAI was specifically developed taking into account the multidimensional and hierarchical nature of EA. The EAI assesses broad evaluating perceptions of or beliefs regarding the natural environment, including factors affecting its quality. It was hypothesized that this inventory would capture both the vertical and horizontal structure of EA by measuring twelve specific facets or primary factors, that define a two-dimensional higher order structure of EA (i.e., preservation and utilization). The twelve factors were established through confirmatory factor analyses and the EAI scales are shown to be unidimensional scales with high internal consistency, homogeneity and high test-retest reliability and also to be largely free from social desirability. The revised NEP Scale was designed to improve upon the original one in several respects:

- It taps a wider range of facets of an ecological worldview
- It offers a balanced set of pro-and-anti-NEP items
- It avoids outmoded terminology

The original NEP was criticized for several shortcomings including a lack of internal consistency among individual responses, poor correlation between the scale and behavior and “dated” language used in the instrument’s statements. Dunlap and colleagues then developed the new ecological paradigm scale to respond to criticisms of the original. This is sometimes referred to as the revised NEP scale to differentiate it from the new environmental paradigm scale. The revised NEP had several strengths, making it a reliable and valid tool for measuring a population’s environmental worldview. In particular, the new scale was internally consistent (people who responded to some items in one pattern tended to respond to other items in a consistent manner) and that it represented a measure of a single scale (that it had unidimensionally). Given its extensive use in many settings, the new ecological paradigm scale will continue

to be used widely. Because no other instrument has been so, extensively accepted as a measure of environmental world views, it will continue to be valuable, if for no other reason than it gives researchers comparisons to make across study types, population types and time.

Choosing and using a measure of EA: There are hundreds of EA measures available based on different conceptual and theoretical frameworks and most researchers prefer to generate new measures rather than organize those already available. Given the broad range of EA measures available, selecting the appropriate measure for your research is imperative. The appropriate measure will be one that reflects the construct you are trying to measure, relating back to your research question. If you are hoping to measure only one specific aspect of environmental attitudes, ensure your measure reflects only that aspect and not another. For example, if you are planning to measure individual’s thoughts about the environment, make sure you use a measure that reflects cognition, rather than affect or behavioral intentions. The quality of your chosen measurement will influence your results (i.e., replicability, level of statistical significance and observed effect sizes) as well as your ability to infer meaningful and valid conclusions. It is important when conducting research to select a measure with good psychometric properties. More specifically, this means that the measure has been assessed in terms of reliability (i.e., how consistent the measure is) and validity (i.e., does it measure what it purports to measure). Additionally, the psychometric properties of the data you collect using the measure should be assessed before you can confidently interpret the results. For example, a scale that is reliable within one sample (e.g., undergraduates) may not generalize to all samples (e.g., adolescents, adults).

It is also important to look out for dimensionality in measuring EA. Dimensionality (and factor structure) refers to the number and nature of variables assessed by items/questions in a measure. Some measures are proposed to be unidimensional with items reflecting a single construct (ECS) while others are multidimensional with sets of items reflecting different components or dimensions (EAI; Milfont and Duckitt, 2010). Dimensionality influences how one scores a measure and its meaning. If a scale includes two or more independent dimensions, the items should be scored accordingly, otherwise the scores produced may not truly reflect the proposed underlying construct and thus, scores may be meaningless. When you use a measure, you should determine, if the originally reported dimensions or factors emerge in your own data. Also, make sure that your measure is scored according to the number of subscales or factors originally intended for the scale.

To modify an existing scale such as shortening a measure, adding additional questions be aware that the measure may not have the same psychometric properties as the original. The more a measure is modified the less it will likely have the same properties as the original. Also be aware that this practice hinders the development of the field because results from different versions of a given measure are not easily comparable. Ensure to re-evaluate the psychometric properties, including reliability, validity and the dimensionality and to report the findings if you do modify a measure. Scales vary in length from brief measures to extensive inventories. Using scales with fewer items or even a single item, may seem appealing. However, shorter measures might lead to psychometric issues and domain underrepresentation. On the other hand, if a measure is too lengthy you may have to worry about participant inattention, fatigue or attrition. You may also need to consider any time restrictions you have when administering measures as this may influence which measure you choose. Fortunately, short-form versions have been validated for some measures and thus may be appropriate to use when length is a factor.

A measure's psychometric properties generalize across different samples or groups such as from adults to children or across cultures. A measure or scale may be valid in one population but not another. Extra precautions should be taken, if one wishes to use a measure with a group that differs from the group with which the measure has originally been created and validated to ensure that the measure remains reliable and valid. Psychometric properties should be examined within each new group and psychometric differences should be examined, understood and rectified before scores are used in those groups. More stringent tests examining the extent to which the measure is equivalent across groups should be employed if possible (Milfont and Fischer, 2010). Some reasons why divergence may be observed are group differences in the understanding and interpretation of words or questions used, the scale may not represent the same latent construct or the construct may psychologically differ across various groups.

Explicit measures, such as self-report questionnaires, are more susceptible to response bias than implicit measures. There are three main biases affecting individual's responses to questionnaires that researchers should be aware of (Bamberg and Moser, 2007): socially desirable responding (tendency to give answers in questionnaires that make participant look good); acquiescence bias (tendency to agree or disagree with all or most of the questions asked) and extremity bias (tendency to choose extreme ratings in response-scale formats). Most recent measures of EA are balanced scales

with positively keyed and negatively keyed items. Balanced scales help minimize the issue of acquiescence bias.

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CONCLUSION

In conclusion, direct self-report techniques such as scales and inventories are the most widely used methods for measuring EA. There are several scales measuring EA but with no accepted gold standard measure in the literature. Moreover, the EA measures available are inadequate for measuring the overall structure of EA. Although, there seems to be a consensus that EA structure is multidimensional and organized in a hierarchical fashion no previous measure has previously attempted to assess the overall structure of EA, hence, the need for a new one. The Environmental Attitudes Inventory (EAI) was developed to address this gap by directly measuring both the horizontal and vertical structure of EA.

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