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The Relationship between Value Types and Environmental Behaviour in Four Countries: Universalism, Benevolence, Conformity and Biospheric Values Revisited

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ABSTRACT

Using the social-psychological literature on the antecedents of environmental behaviour and comparative data from Germany, India, Israel and South Korea, we test four value types that correspond with environmental behaviour. Our cross-national context represents varying social, economic, cultural and environmental configurations, giving credence to the effects of values. The authors collected survey data among students on a variety of environmental behaviours and on questions that comprise Schwartz's value scale. The results show similarities between the countries in the effect of biospheric values and differences in the effects of the other values tested. We also find that biospheric value is

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the most important value type for explaining environmental behaviour, and that biospheric values, universalism and benevolence – three key values that we analyse – have different effects on environmental behaviour, and therefore should be treated separately rather than in a unified self-transcendence value orientation. We finally demonstrate the importance of conformity in the analysis of environmental behaviour. Our conclusions point to the importance of further exploring the mechanism that links values and environmental behaviour while contextualising it in different national and cultural settings.

KEYWORDS

Pro-environmental behaviour, environmental values, environmental philanthropy, comparative research, youth

While environmental researchers studying the impact of human behaviour on the environment describe complex but still not fully understood associations among attitudes, beliefs, concerns, and pro-environmental behaviour, they largely recognise the important role that values play as a primary antecedent of environmental action (De Groot and Steg 2008; Oreg and Katz-Gerro 2006; Schultz and Zelezny 1999).

Research in the disciplines of social psychology, environmental psychology and sociology examining the effect of values on environmental behaviour often draws on Schwartz's (1992) value theory. This theory posits ten types of human values, which depict universal content and transcend specific situations, cultures and nations, and that can be ordered by their relative importance to the individual (Schwartz 1992, 2003). The ten value types are circularly structured along two aggregated dimensions. One dimension positions 'self-enhancement' values such as power and achievement as opposed to 'self-transcendence' values such as universalism and benevolence; the second dimension places values of 'conservatism' such as religion, security and conformity in contrast to 'openness to change' values, including creativity, excitement and independence.

Generally, the self-transcendence/self-enhancement aggregated dimension has received more attention in studies of the links between human values and environmental action, with the common argument being that individuals with a preference for self-transcendent values are more likely to engage in pro-environmental behaviour, whereas individuals with an inclination toward self-enhancement values tend to report more negative environmental attitudes and behaviours (Dietz et al. 2005; Nordlund and Garvill 2002; Schultz 2001; Steg and De Groot 2012; Steg and Vlek 2009). While these aggregated

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dimensions usually show convincing results, such depictions do not, however, consider possible differences within the value types that comprise the aggregated value dimensions, especially regarding the self-transcendence value orientation.

Therefore, in this article we comparatively test the association of several forms of environmental behaviour with three of Schwartz's value types – namely universalism, benevolence and conformity. We add another critical modification that was introduced in the environmental psychology literature (Stern and Dietz 1994), which emphasises the unique features of the biospheric value. The rationale for our selection of these four values is described in further detail below. It is important to stress herein that these values are only a subset of the full set of Schwartz's value theory, but it is a deliberate subset with spatial proximity on the circular structure of values, as discussed below.

Particularly, we set three main goals in this study: (1) to re-evaluate whether the self-transcendence value orientation should be divided into its value types of universalism and benevolence; (2) to confirm the separate effects of biospheric and universalism value types, which have already been described in previous research (e.g. Dietz et al. 2005), but not in a comparative setting; and (3) to test the hypothesis that the spatially adjacent conformity value type should receive more attention in the analysis of environmental behaviour because there are strong reasons to believe that the underlying meanings of conformity might have implications on such behaviour.

We extend the literature in two important ways. First, we revert to Schwartz's original theory and value structure in assessing the association between value types and environmental behaviour. Second, we test these associations in a four-country comparative setting, allowing us to bolster the vigour and the generalisability of our findings. By doing so, we answer the call to study the 'effects of contextual factors on environmental behaviour' (Steg and Vlek 2009: 315).

The article is structured as follows: we first review the literature on values, value orientations and their links to environmental behaviours, proposing a set of research hypotheses on the four value types that we deem relevant for environmental behaviour. We then describe our comparative research setting, explain the methodology and data analysis. Finally, we present our findings and discuss their implications.

ENVIRONMENTAL BEHAVIOUR AND VALUE ORIENTATIONS: KNOWLEDGE, GAPS, AND HYPOTHESES

Defining personal values

Human values are defined in the social psychology literature as 'deeply rooted, abstract motivations that guide, justify or explain attitudes, norms, opinions

and actions' (Schwartz 2003: 261). They contain universal content and underlie specific attitudes and beliefs about desirable conditions, and serve as guiding principles in individuals' lives, shaping their private and public behaviour (Rokeach 1973; Schwartz 1992). Given their abstract nature, values transcend specific situations, cultures and nations, and can be ordered according to their relative importance to the individual (Schwartz 1992, 2003).

Schwartz used 56 statements expressing personal values to identify ten types of values that comprise a universal continuum of motivations. The ten value types are clustered spatially along two dimensions of value orientations. One dimension runs between self-enhancement and self-transcendence, describing people's preference for benefits for themselves versus benefits for others, and the other between conservatism and openness to change, describing the inclination of people to conform to tradition versus seeking and being open to change. The self-transcendence value orientation includes the value types of universalism and benevolence; the self-enhancement value orientation includes achievement and power. Openness to change includes self-direction, stimulation and hedonism, while conservatism includes tradition, conformity and security. Research conducted on hundreds of samples in dozens of countries confirmed the universality of this value structure, both in content and in the relationships among the ten values (Sagiv and Schwartz 1995).

Values in environmental behaviour research

Values have several characteristics that make them especially interesting as precursors of environmental behaviour. First, they are more general than world views and relate to broad orientations that are part of one's personality (ibid.). Therefore, an analysis of the effect of values on environmental behaviour captures the deep motivational basis of such behaviour, delineates the preconditions for environmental behaviour and is expected to be blind to a specific measure of behaviour. Second, values are formed early in life through socialisation at home and through learning experiences, and therefore are relatively stable over one's lifetime (Schwartz 1992). Given that values become rooted at an early age, educators and policy makers might find it difficult to alter their influence on environmental behaviours. Finally, because of their general and abstract character, the effect of values on behaviour should transcend specific situations and socio-economic contexts, making them suitable for study in a cross-national comparison of environmental behaviour (Rokeach 1973).

Various studies over the past three decades have linked Schwartz's value theory to the study of environmental attitudes, beliefs, concerns, intentions and actions/behaviours (Corraliza and Berenguer 2000; De Groot and Steg 2007, 2008; Dietz et al. 2005; Nordlund and Garvill 2002; Oreg and Katz-Gerro 2006; Schultz and Zelezny 1999; Steg and Vlek 2009; Stern 2000; Stern and Dietz 1994; Stern et al. 1993). The general pattern emerging from this body of

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knowledge is that individuals who give priority to values beyond their immediate interests (collective, universal, altruistic values) are more likely to express pro-environmental attitudes and engage in pro-environmental behaviours. Those who give priority to individual or self-interest values are less inclined to engage in pro-environmental behaviours (Steg and De Groot 2012; Steg and Vlek 2009).

To express these patterns in Schwartz's terminology, the self-transcendence value orientation, which reflects collective, universal values beyond one's immediate interests, is positively associated with pro-environmental behaviour, whereas the self-enhancement value orientation, reflecting a concern for one's own interests and power, is negatively (or insignificantly) associated with pro-environmental attitudes and behaviours (Hansla et al. 2008; Karp 1996; Nordlund and Garvill 2002, 2003; Pepper et al. 2009; Schultz 2001; Stern and Dietz 1994). Other studies have used another set of established but still equally aggregated distinctions among egoistic, social-altruistic and biospheric value orientations (De Groot and Steg 2007, 2008; Stern et al. 1995), or an analogous classification of individual, social, and eco-centric value orientations (Lockwood 1999), to examine the impact of values on environmental actions.

The other value dimension, which contrasts openness to change and conservatism, has not been equally theorised regarding its influence on environmental issues (De Groot and Steg 2008: 334), and has accordingly received less attention in the literature on values and environmental behaviours.

In the following sections, we disaggregate the value orientations, and discuss four specific value types – universalism, benevolence, conformity and biospheric values – that have been identified, or as we argue below, should be considered, to affect environmental behaviour. The biospheric value was not identified as a separate value in Schwartz's original value scale but has been suggested as an addition to his theory in the environmental context (Stern et al. 1993). Moreover, in his refined theory (Schwartz 2012), Schwartz specifically distinguishes universalism-nature as one of nineteen values. With regard to conformity, we argue that in certain cultures it should be considered a value type with significant normative foundation that has a meaningful association with environmental behaviour. Our study goals and constructs build on recent research that has identified and examined the importance of specific values, or value types, in the context of environmentalism (e.g. Hansla et al. 2008; Steg et al. 2014; van der Werff et al. 2014).

Differentiating between universalism and benevolence and their association with environmental behaviour

As noted, most literature linking values and environmental indicators has focused on the aggregated value orientation of self-transcendence and its positive association with pro-environmental behaviour. However, recent critics have

argued that such a depiction ignores possible differences in the effect of the two value types that comprise self-transcendence: universalism and benevolence (De Groot and Steg 2008; Hansla et al. 2008). Universalism is a wider form of altruism that includes values such as social justice, a world at peace, unity with nature, equality and protection of the environment. The motivational goal of this value type is ‘an understanding, appreciation, tolerance, and protection for the welfare of all people and for nature’ (Schwartz 1992: 12). Benevolence, on the other hand, is a narrower form of altruism towards in-groups and includes values such as loyalty, responsibility, honesty, forgiveness, meaning in life, true friendship and spirituality (Gärbling 1999). Its motivational goal has to do with ‘preserving and enhancing the welfare of those with whom one is in frequent personal contact (the “in-group”)’ (Schwartz 2012: 7).

Thus, universalism corresponds more closely to a pro-social and pro-environmental orientation than benevolence (Gärbling 1999). However, benevolence has also been discussed as an environmental virtue, encompassing other environmental virtues such as compassion, friendship and gratitude (Sandler and Cafaro 2005). Central to benevolence is a concern for the welfare of another, made possible by the imaginative dwelling on the condition of the other (Frasz 1993). Accordingly, Hansla et al. (2008) demonstrated that universalism and benevolence are related to different measures of environmental concerns. In this article, we seek to support and extend their analysis by looking at the effects of universalism and benevolence on various measures of environmental behaviour.

We find additional support for the different effects of universalism and benevolence on environmental behaviour in research that points to a distinction between the two value types in fields other than environmental behaviour. For example, young political consumers in Brazil – defined as those who take into account the public consequences of their private consumption – were characterised more by benevolence than by universalism or other value types (Barcellos et al. 2014).

Similarly, Lee et al. (2014) determined that the value of benevolence, interpreted as ‘benefitting the family’, rather than universalism, mattered for Chinese consumers in their decisions to purchase healthy drinks. On the other hand, Doran (2009) demonstrated that universalism influenced consumers of fair trade goods as hypothesised, but, contrary to expectations, benevolence had no bearing on the decision to buy fair trade products. Doran (2010) continued to explore this issue in the context of ethical consumption, found similar results and provided explanations based on the effects of specific values within the benevolence value type. Finally, Axsen and Kurani (2013) showed that while research typically connects environmental concern with universalism, a wider array of values is at play in the context of sustainability. They suggested that further research should explore additional motivational links to sustainability that considers other values.

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Based on these studies, our first research question is:

Q1: Do universalism and benevolence have different effects on environmental behaviour?

We formulate a conservative hypothesis with regard to this research question because existing evidence shows mixed results:

H1: Universalism will have a significant positive effect on environmental behaviour, and benevolence will have an insignificant effect on environmental behaviour.

Differentiating biospheric values from universalism

In addition to the emphasis on the separate effects of two specific value types within the broad value orientation of self-transcendence, the research on environmental behaviour suggests extricating the biospheric dimension from universalism (Steg et al. 2005; Stern et al. 1995, 1999). While universalism reflects the degree to which individuals take into account the welfare of other people and other living things in their notion of self, the biospheric value type refers to the biosphere as having an intrinsic value, meaning that nature is worth protecting not only because of its instrumental value to human beings, but also for its own sake (Stern et al. 1999; Stern et al. 1995).

Thus, a modified universalism scale proposes a distinction between universalistic values, often called altruistic values (Stern 2000), and biospheric values, which include values such as protecting the environment, unity with nature, respecting the earth and preventing pollution (De Groot and Steg 2007; Hansla et al. 2008). Accordingly, Stern et al. (1993) have expanded Schwartz's theory to allow for a specific orientation toward environmental issues, including values based on self-interest and concern with other species and the biosphere, as well as concern with the welfare of other human beings.

While some studies have not been able to validate a value structure in which the biospheric values form a biospheric value type that is separate from the values that form a universalism value type (Corraliza and Berenguer 2000; Nordlund and Garvill 2002), Steg and his colleagues have established this structure in a series of articles (e.g. De Groot and Steg 2008; Steg et al. 2005). When looking at the separate effects of universalism (altruism) and biospheric value types, Steg et al. (2005) found distinct associations with a variety of attitudinal and behavioural variables. On the other hand, Hansla et al. (2008) examined the effect of a 'purer' measure of universalism, which did not include the nature-related items, and determined that it had a significant effect on awareness of the consequences of environmental problems for the biosphere. However, they did not control for a measure of biospheric values.

Based on this literature, we seek to identify a biospheric value type that is separate from universalism. Once we establish this value structure, we can formulate our second research question:

Q2: Do universalism and biospheric value types have similar effects on indicators of environmental behaviour?

We hypothesise that once we remove the items related to nature and the environment from the measures of universalism, and enter measures of both biospheric and universalism values into the same model, universalism (altruism) will no longer exhibit significant associations with environmental behaviour.

H2: The biospheric value type will have a significant positive effect on environmental behaviour, whereas universalism (without the biospheric items) will have an insignificant effect on environmental behaviour.

Conformity and environmental behaviour

Our third goal is examining conformity as a value type that is not typically studied in association with environmentalism.¹ Conformity, according to Schwartz, includes the values of obedience, self-discipline, politeness and honouring parents and elders. It is the inclination of people to abide by social norms and derives from the idea that individuals should restrain those inclinations that might disrupt and undermine smooth interactions and group functioning (Dodds 2005). The defining motivational goal of this value type is the ‘restraint of actions, inclinations, and impulses likely to upset or harm others and violate social expectations or norms’ (Schwartz 2012: 6).

Conformity is linked to the conservatism value orientation in Schwartz’s theory. Schwartz (ibid.) explains that both benevolence and conformity may motivate the same helpful act, as they both promote cooperative and supportive social relations. Benevolence provides an internalised motivational base for helpful behaviour, while conformity promotes cooperation in order to avoid negative outcomes for the self (ibid.: 7). Conformity and benevolence are also spatially adjacent on Schwartz’s value map. Along these lines, conformity is related to tradition, conservatism and conventionalism. To the extent that environmental advocacy and environmental behaviour are viewed as non-traditional and non-conventional behaviour, there should be a negative correlation with the value of conformity. Indeed, Schultz and Zelezny (1999) predicted that conformity, which is more aligned with the conservatism value orientation, would be negatively associated with environmental attitudes because such attitudes are part of a new social paradigm that would be negatively

1. Research has also shown that hedonic values are related to measures of environmental behaviour (Steg et al. 2014). However, this measure is not available in our data.

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related to values that encourage conformity to tradition. However, they found that conformity was positively related to the New Environmental Paradigm measure of environmental attitudes and to a measure of eco-centrism. They therefore maintained that further research is needed to explain this finding and to theorise the relationship between conformity and environmental behaviour.

On the other hand, to the extent that conformity values make individuals more likely to obey existing behavioural norms, we would expect those who score high on conformity to do what everybody does. If in some contexts environmental behaviour is deemed conventional – socially acceptable and something that everyone does – we should thus expect conformity to have a positive relationship with environmental behaviour. Interest in environmental issues is becoming more conventional and commonplace; scholars have argued that behaviours that consider the effect of humans on nature have become a norm in some countries (Inglehart 1995), and environmental issues are becoming prominent in the media, in schools, in social movements and in politics (Anderson 2013). Thus we expect that individuals who score high on conformity-to-norm values will also be more likely to engage in pro-environmental behaviour. If ‘conformity’ is viewed according to this understanding of the term, then it is a good candidate for positively affecting environmental behaviour. For example, Philippe and Durand (2011) determined that conformity is associated with environmental behaviour at the level of the firm for companies seeking to enhance or maintain their reputations. Similarly, Carlsson et al. (2010) demonstrated that the more widespread green consumerism is in society, the higher the price conformist individuals are willing to pay for green products.

To explore this issue further, we formulate our third research question:

Q3: What is the effect of the conformity value type on environmental behaviour?

We therefore hypothesise that:

H3: Conformity will have a significant positive effect on environmental behaviour.

A multi-country context

With a few exceptions, most research on the effect of values on behaviour has reported findings from single-country settings (e.g. Milfont, Duckitt et al. 2010; Milfont, Sibley et al. 2010; Schultz and Zelezny 1999). Milfont, Duckitt et al. (2010) examined the links between values, attitudes and behaviour in Brazil, New Zealand and South Africa, emphasising the similarity between these countries in the way values shape attitudes and behaviour. In a different study, a sample of 468 students from 59 countries was used, but the researchers did not offer any comparative country-related insights (Milfont, Sibley et

al. 2010). Schultz and Zelezny (1999) also studied the association between values and environmental attitudes in 14 countries, mostly in North America and Latin America. They expected that Latin American countries would be less likely to adopt environmental attitudes, but found evidence for consistency between countries in the predictors of environmental attitudes.

We tested the value-specific hypotheses outlined above in a cross-national context. The countries included in our analysis – Germany, India, Israel and South Korea – represent varying social, economic, cultural and environmental contexts that are likely to lead to various configurations of the antecedents of environmental behaviour (Katz-Gerro et al. 2014). In Germany, environmental issues have been at the forefront of public interest for several decades; in South Korea (hereafter: Korea), India and Israel, concern for the environment is a relatively recent national issue. The history of environmental struggles and the institutionalisation of environmental awareness is very different between these countries and revolves around distinct issues and concerns. The structure of environmental values in Asian countries differs from those in Western countries, and in Israel it is characterised by a strong affinity with global trends but low levels of environmentalism.

In terms of societal and economic dimensions of comparison, Germany, Korea and Israel are considered high-income countries and score high on the human development index (HDI), while India is classified by the World Bank as a lower-middle-income country and scores very low on the HDI. Notwithstanding the economic development similarities between Germany, Korea and Israel, a significant cultural division can be drawn between Germany as a Western country and the other three countries, which have strong attributes of Eastern societies. This is why we posit that identification of systematic effects of values on behaviour, which cut across variations between the countries, will make a strong case for establishing the role that values play in shaping environmental behaviour.

The essence of Schwartz's value theory is its universal applicability. Given that concern for environmental issues is related to the level of economic development and level of post-materialistic values (Inglehart 1990), we maintain that additional research is called for to test the association between values and environmental behaviours from a comparative perspective. Comparisons of Western and non-Western countries that differ in their economic, cultural and environmental contexts are particularly needed. Although it is often the case that different contexts lead to different associations between variables, when it comes to the effect of values on environmental behaviour across countries, we expect to find similar patterns for two reasons. First, values are general and robust constructs. Second, there is a dearth of previous research that theorises about possible cross-country differences in the associations between values and environmental behaviour. We aim to contribute new evidence on this issue. Therefore, we ask a fourth research question:

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Q4: Can we generalise the associations between the four value types (universalism, benevolence, biospheric values and conformity) and environmental behaviour to different countries?

Our null hypothesis is that the associations will be similar across countries:

H4: Similar associations will emerge between value types and environmental behaviours in the four countries compared here: Germany, India, Israel and Korea.

Summary of academic research and our contribution

Most studies examining the link between values and environmental behaviour have focused on specific value types and ignored others, and have generally been conducted in single-country settings. We assess the associations between four of Schwartz's value types, whose meanings make them likely candidates to be associated with the private and public environmental behaviours of students in four countries: Germany, India, Israel and Korea.

We augment the extant literature on values and environmental behaviour by addressing four questions. (1) Does benevolence have an association with environmental behaviour separate from universalism? (2) Once we separate the biospheric values from universalism, does universalism still have a positive association with environmental behaviour? (3) Does conformity have an association with environmental behaviour? (4) Do these value types have similar effects across countries?

Our study also advances current research by overcoming several methodological shortcomings in previous studies. First, while Schwartz indicates that the appropriate way to establish the value structure in a dataset is by means of a confirmatory factor analysis, for reasons having to do with sample size and number of values measured, some past studies have used an exploratory factor analysis only. In accordance with Schwartz, we rely on confirmatory factor analysis to interpret our results. Second, those studies that did use a confirmatory factor analysis did not always report estimates and goodness-of-fit measures. These are reported in the findings below. Third, other studies measured the responses to Schwartz's items with a five-point Likert scale instead of the original nine-point scale, which is used in this study. Finally, some studies used a regression analysis, which seems to be less appropriate for specifying the complex links between the variables in a causal model (Hansla et al. 2013; Stern et al. 1995). We use structural equation modelling (SEM) estimation to interpret our results. Table 1 summarises our research questions and corresponding hypotheses.

TABLE 1. Summary of research questions and hypotheses

Research question	Hypothesis
Q1: Do universalism and benevolence have different effects on environmental behaviour?	H1: Universalism will have a significant effect on environmental behaviour, and benevolence will have an insignificant effect on environmental behaviour.
Q2: Do universalism and biospheric value types have similar effects on indicators of environmental behaviour?	H2: The biospheric value type will have a significant positive effect on environmental behaviour, whereas universalism (without the biospheric items) will have an insignificant effect on environmental behaviour.
Q3: What is the effect of conformity value type on environmental behaviour?	H3: Conformity will have a significant positive effect on environmental behaviour.
Q4: Can we generalize the associations between the four value types (universalism, benevolence, biospheric values and conformity) and environmental behaviour to different countries?	H4: Similar associations will emerge between value types and environmental behaviours in the four countries compared.

METHOD

Participants and procedure

Self-reported, anonymous surveys were administered to students in four large universities in Germany (conducted in 2011 in German; $N = 657$), Israel (in 2010 in Hebrew; $N = 1929$), India (in 2013 in English; $N = 1427$) and Korea (in 2011 in Korean; $N = 2047$). The surveys were administered online, except in India, where a paper-and-pencil version was used. Other than Germany, the samples vary in size only slightly. We do not expect the range of sample sizes to have an impact on the significance of the associations.²

We acknowledge the limitation of this article to the extent that a student population is involved. Students may, on the one hand, represent future leaders in society, the bearers of new ideas, and may be more predisposed to pro-environmental behaviour; they are the 'generation green' (McDougle et al. 2011) who are better informed and view environmentalism almost as a rite of passage. On the other hand, students may not face challenging daily decision making in the same way as the general population. However, since our

2. For the web-based surveys, we collaborated with university administrators to gain access to the university e-mail system, inviting students to participate in the study via an e-mail link. To increase the response rate, surveys were available online for six weeks, with two reminders sent during that period (weeks 2 and 4). For the paper-and-pencil survey, we collaborated with university administrators to gain access to students in classrooms, where the surveys were personally distributed by one of the authors, and participants completed them on a voluntary basis.

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main interest is in the associations between values and behaviour within each country, in this respect the findings give us a comparable understanding of the cross-cultural differences within these populations despite their limitations.

Questionnaire

The survey tool was originally constructed in English and then translated into the official language of each sub-sample (Hebrew, German, Korean) by bilingual translators. The research team discussed the translated version to reach a consensus about the best wording in each language. To increase reliability, the survey tool was also piloted in each country prior to its launching. The Israeli sample was composed of 68 per cent women and 39.5 per cent graduate students (compared to undergraduates); the German sample was composed of 52.3 per cent women and 8.8 per cent graduate students; the Korean sample was composed of 46.6 per cent women and 15.5 per cent graduate students; and the Indian sample included 57.4 per cent women and 21 per cent graduate students. Our findings pertain to student samples, and are thus limited in terms of generalisability. While not representative, the samples are comparable across countries because all respondents were university students.

Measures

Values

We used a modified instrument of Schwartz's (1992) original value scale by including a reference to the biospheric value type (Stern et al. 1999) and items relevant to understanding beliefs and actions related to the environment (De Groot and Steg 2008). The instrument contains 23 items to measure four value orientations: self-transcendence, self-enhancement, openness to change and conservatism (Stern et al. 1998).

Of the entire value scale, we here assess four value types using twelve items: *biospheric values* (unity with nature, protect the environment, respect for the earth), *universalism* (social justice, world at peace, equality), *benevolence* (loyal, honest, forgiving) and *conformity* (self-discipline, honouring parents and elders, obedience). Respondents were asked to rate the importance of each value item 'as a guiding principle in *my* life' on a nine-point scale labelled: 7 (of supreme importance), 6 (very important), 5 (unlabelled), 4 (unlabelled), 3 (important), 2 (unlabelled), 1 (unlabelled), 0 (not important), and -1 (opposed to my values).

Environmental behaviour

We used several measures of environmental behaviours – five measures of private-sphere environmental behaviours, and one measure of environmental behaviour in the public sphere. Private-sphere behaviours are daily activities

that evince concern for the environment undertaken in the private sphere (Stern 2000). Participants were asked to indicate how often they engaged in five self-reported, daily activities: turn appliances and lights off; use energy efficient light bulbs;³ walk and/or bike instead of using a car for environmental reasons; reuse shopping bags; and recycle. Likert-type response options were 1 (never), 2 (occasionally), 3 (frequently), and 4 (always).⁴ We decided to model the five behaviours (turn appliances and lights off; use energy-efficient light bulbs; walk and/or bike instead of using a car for environmental reasons; reuse shopping bags; and recycle) separately rather than as part of an index because we are interested in the differences between the types of behaviours.

Environmental philanthropy is a composite measure of environmental giving and volunteering. Environmental volunteering and environmental giving were each measured by a binary yes/no response to the question: 'In the past two years, have you volunteered in/donated to any environmental organisation?' We combined these two binary measures into a single continuous outcome variable so we could use SEM.⁵

Table 2 presents the means and proportions of all of the environmental behaviour indicators by country. The private-sphere behaviours show similar means across countries, with two exceptions: a lower mean of reusing shopping bags in Israel that could be explained by a lack of regulation of the issue, and a lower mean of recycling in India, which can be attributed to the lack of a recycling infrastructure in the country. Differences between the countries are more evident when looking at environmental volunteering and environmental donating, which is to be expected based on differences in the accessibility of volunteering and donating, and the structure of opportunities to volunteer and donate.

RESULTS

The structure of selected values

The purpose of the preliminary data analysis reported in this section is to establish the structure of the values in the four countries. Previous research has determined that the value domains can be analysed as a subset without altering the meaning of the measured items within the entire value spectrum (Schultz

3. We acknowledge that student populations might not control the decision regarding whether or not to use energy-efficient light bulbs if they live in an environment to some extent divorced from everyday life, such as dorms or rental accommodation, and hence we expect lower values of the responses to this behaviour.
4. The correlations among the items for the pooled sample are weak to moderate, and the reliability score is 0.508.
5. 0 = no environmental philanthropy, 1 = respondent has either volunteered or donated, 2 = respondent has both volunteered and donated. The point-biserial correlation between the two philanthropy items is 0.27 ($p < 0.01$).

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TABLE 2. Descriptive statistics of environmental behaviours by country: proportions and means

Dependent variables	Germany (N = 657)	India (N = 1427)	Israel (N = 1929)	Korea (N = 2047)
Turn appliances and lights off when not in use	3.29 (0.64)	3.47 (0.72)	3.53 (0.61)	3.24 (0.74)
Use energy efficient light bulbs	2.88 (0.95)	3.31 (0.84)	2.87 (1.04)	2.71 (0.96)
Walk or bike for environmental reasons	2.93 (0.83)	2.92 (0.97)	2.08 (1.05)	3.05 (0.83)
Reuse shopping bags	3.43 (0.79)	3.16 (0.94)	2.76 (1.05)	3.42 (0.75)
Recycle	3.42 (0.77)	2.33 (1.04)	2.98 (1.03)	3.50 (0.75)
Environmental philanthropy (combined)	0.2	0.4	0.2	0.3
<i>Environmental volunteering</i> (% yes)	4.2	20.6	7.6	12.4
<i>Environmental donating</i> (% yes)	13.3	19.6	14.3	12.9

Note. standard deviations are in parentheses

and Zelezny 1999; Stern et al. 1999). Moreover, subsets of value types have been employed specifically in research on environmental behaviour (Steg et al. 2014). Accordingly, we first determined the reliability scores of the selected value types and the correlations between value types by country (see Table 3). All of the reliability scores are close to or above the conventional 0.70 threshold, with the exception of benevolence in Korea. The correlations between value types within each country are positive and significant in all cases, a recurrent feature of the Schwartz value scheme.

Our second task was to confirm that the four value types of interest – universalism, biospheric, benevolence and conformity – could be distinguished in all four countries. Establishing the distinction between universalism and biospheric values is particularly important because even though previous research has demonstrated the statistical validity of this distinction (Steg et al. 2005), we put it to the test in four different countries. We ran a confirmatory factor analysis using the Amos software package (version 22) for all four countries, and specified the four factors and correlations among the factors. The model fit

TABLE 3. Reliability scores and raw mean correlations of selected value types, by country

Reliability Scores (<i>Cronbach α</i>)				
	Germany	India	Israel	Korea
Universalism	.77	.64	.78	.69
Biospheric	.69	.64	.65	.70
Benevolence	.67	.66	.86	.55
Conformity	.87	.76	.71	.89
Raw Mean Correlations (<i>Pearson's r</i>)				
Germany				
	Biospheric	Benevolence	Conformity	
Universalism	.585**	.505**	.316**	
Biospheric		.497**	.335**	
Benevolence			.558**	
India				
	Biospheric	Benevolence	Conformity	
Universalism	.609**	.559**	.541**	
Biospheric		.568**	.566**	
Benevolence			.658**	
Israel				
	Biospheric	Benevolence	Conformity	
Universalism	.527**	.600**	.417**	
Biospheric		.485**	.370**	
Benevolence			.625**	
South Korea				
	Biospheric	Benevolence	Conformity	
Universalism	.672**	.565**	.374**	
Biospheric		.592**	.412**	
Benevolence			.628**	

** $p < .01$

was confirmed by the conventional goodness-of-fit measures (GFI = .980; CFI = .980; RMSEA = .050).⁶

Next, we checked the fit of the four value scales for each country using metric invariance and configural invariance with a multi-group confirmatory factor analysis (Arbuckle 2010). For configural invariance, we tested whether the factor structure was consistent across the samples (Grouzet et al. 2005; Oreg et al. 2008). For the metric invariance, we tested whether the factor loadings were consistent across the samples. The results of the configural test showed a good fit between the model and the data ($\chi^2(198) = 2198.86; p < .01$;

6. Fit indices determine how well a model reproduces the data. We report values for the goodness-of-fit index (GFI), comparative fit index (CFI) and root mean square error of approximation (RMSEA).

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GFI = .950; CFI = .930; RMSEA = .040). The results of the metric test also produced a good fit between the model and the data ($\chi^2(214) = 2368.13$; $p < .01$; GFI = .940; CFI = .930; RMSEA = .041).

To test the metric invariance of the factor structure – that is, to make sure that the loadings were similar across the samples – we had to confirm that the fit measures of the metric model were not lower than those of the configural model. One possible way would be to conduct a chi square difference test; however, this test is sensitive to sample size and can produce spuriously significant results in larger samples. Therefore, we preferred to look at differences between the other fit measures. This difference should be less than or equal to 0.01 (Oreg et al. 2008; Vandenberg and Lance 2000). The comparison showed a good fit between the model and the data, as the values of the three measures of fit were very similar in the configural and metric models. This result means that the factor structure can be applied to all four countries and that the meaning of each value is similar across countries.⁷

SEM model estimation

The results from five structural equation models by country are presented in Table 4. The first four models in each country include the association between each value type separately and the six outcome variables. Our purpose in this analysis is to pre-empt multi-collinearity concerns and to establish the independent effect of each value type before controlling for the other value types.⁸ In the fifth model, we entered the association between all of the value types together and the outcome variables (see Hansla et al. 2008; Hansla et al. 2013). Possible issues of multi-collinearity due to entering all of the value types in the fifth model are solved by introducing double-sided correlations between the latent factors, which produces the net effect of each value, and by interpreting the results in comparison to the corresponding effects from the single-value models (Schwartz et al. 2012).

All five models showed excellent goodness-of-fit measures: biospheric values only ($c^2 = 129.227$; $p < .01$; GFI = .994; CFI = .958; RMSEA = .030); universalism only ($c^2 = 158.714$; $p < .01$; GFI = .993; CFI = .940; RMSEA = .034); benevolence only ($c^2 = 158.935$; $p < .01$; GFI = .993; CFI = .940; RMSEA = .034); conformity only ($c^2 = 154.902$; $p < .01$; GFI = .993; CFI = .941; RMSEA = .033); and the full model ($c^2 = 114.328$; $p < .01$; GFI = .996; CFI = .992; RMSEA = .028).

7. See Appendix 1 and Appendixes 2a-2d for information on factor loadings, reliability tests and correlation coefficients by country.

8. Demographic variables (gender, age, education, environmental knowledge) were entered as control variables in the analysis but are not reported here. By and large, when we included the control variables, the pattern of results remained similar to those reported in Table 4.

TABLE 4. Five structural equation models of value types on six measures of environmental behaviour, by country

		Turn off appliances	Energy- saving light bulbs	Walk/ bike instead of using a car	Reuse bags	Recycle	Environmental phil- anthropy
Germany							
Model 1	Biospheric	.18**	.21**	.16**	.24**	.24**	.17**
Model 2	Universalism	.16**	.18**	.17**	.16**	.17**	.10*
Model 3	Benevolence	.13**	.12**	.09*	.18**	.19**	.04
Model 4	Conformity	.17**	.10**	-.00	.12**	.14**	-.03
Model 5	Biospheric	.11*	.16**	.12*	.20**	.20**	.20**
	Universalism	.07	.09~	.11*	.00	.01	.02
	Benevolence	-.04	-.02	.04	.08	.07	-.03
	Conformity	.13**	.04	-.10*	.01	.03	-.09~
India							
Model 1	Biospheric	.12**	.11**	.05*	.10**	.07*	.05*
Model 2	Universalism	.06*	.07**	.05*	.05*	.01	-.01
Model 3	Benevolence	.08**	.08**	.02	.10**	.04	.01
Model 4	Conformity	.08**	.08**	.03	.14**	.05~	.05~
Model 5	Biospheric	.11**	.09*	.04	.05	.09*	.08*
	Universalism	-.03	-.00	.04	-.04	-.06~	-.07~
	Benevolence	.01	.03	-.02	.04	.01	-.04
	Conformity	.03	.02	-.01	.08*	.02	.06~
Israel							
Model 1	Biospheric	.18**	.15**	.15**	.20**	.20**	.14**
Model 2	Universalism	.07**	.05*	-.01	.03	.02	.00
Model 3	Benevolence	.06**	.04~	-.04~	-.01	.02	-.03
Model 4	Conformity	.06*	.03	-.03	-.06**	-.06**	-.08**
Model 5	Biospheric	.21**	.18**	.25**	.30**	.29**	.23**
	Universalism	-.03	-.03	-.08*	-.05	-.10**	-.04
	Benevolence	-.02	-.02	-.09**	-.05	.03	-.04
	Conformity	.00	-.01	-.03	-.12**	-.15**	-.12**
South Korea							
Model 1	Biospheric	.17**	.10**	.08**	.13**	.10**	.03
Model 2	Universalism	.13**	.07**	.08**	.10**	.09**	-.02
Model 3	Benevolence	.11**	.07**	.09**	.08**	.04~	.00
Model 4	Conformity	.05*	.06**	.05*	.00	-.01	.03
Model 5	Biospheric	.16**	.09**	.02	.11**	.08*	.08*
	Universalism	.02	.00	.03	.03	.07*	-.07*
	Benevolence	.03	.00	.07*	.05	.00	-.04
	Conformity	-.04	.02	-.01	-.09**	-.07**	.05~

Note. Figures are standardised effects
 ~p < .1, *p < .05, **p < .01

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The biospheric value type, as a single predictor, had a positive and significant correlation with all measures of environmental behaviour in all countries, with the exception of an insignificant result with regard to environmental philanthropy in Korea (Model 1). When universalism was entered as a single predictor (Model 2), its association with environmental behaviour was positive and significant for all indicators in Germany, all indicators except philanthropy and recycling in India, only two indicators in Israel, and all indicators except philanthropy in Korea. However, universalism lost most of its significance once we entered the four value types into a unitary model (Model 5).

When benevolence was entered as a single predictor (Model 3), it had a positive and significant relationship with all items except philanthropy in Germany; with appliances, energy, and bag use in India; only with turning appliances off in Israel; and with all items except recycling and philanthropy in Korea. This is a complex picture of results, with interesting differences between the countries. In particular, benevolence seems to be less associated with environmental behaviours in Israel and India.

Finally, when conformity was entered as a single predictor (Model 4), it demonstrated a positive and significant association with four dependent behaviours in Germany, three similar indicators in India and three in Korea. However, in Israel, an inconsistent pattern of associations emerged: positive, negative or insignificant with the measured behaviours.

When we entered all four value types into a unitary model (Model 5), only the biospheric value type persisted in showing a positive and significant association with most environmental behaviours in each country. The association with universalism became insignificant for most of the behavioural indicators in Germany, Korea, and India. In addition, universalism became negative and significant for two indicators in Israel and one indicator in Korea, and borderline significant ($p < 0.1$) for two measures in India as well. Benevolence became insignificant in Germany and India. In Korea, benevolence remained significant for only one indicator in the full model, whereas in Israel, the effect on one indicator that was not significant earlier became negative and significant in the full model. Finally, conformity lost most of its significant effects in all of the countries except Israel, where it continued to have a negative and significant impact on three items. Some of the positive effects became negative (Korea), but most of them were not significant.⁹

The comparison of the behavioural indicators across the countries evident in the full model (Model 5) provides several interesting observations. First, two indicators – turning appliances off and using energy-saving light bulbs – are significantly associated *only* with biospheric values in all countries, with

9. We estimated the five models using the pooled data from all of the countries. Results are available upon request. A clear pattern emerged with regard to the biospheric value, which is consistently positive and significant. The other effects are less consistent with the country-specific results.

the exception of the positive effect of conformity in Germany. Second, walking/biking behaviours are shaped by different sets of values in the different countries, with more similarity between Korea and India compared to the other countries. This finding is probably contextual in that it reflects the ease of riding bikes and the presence of bicycle lanes in the cities where the questionnaire was administered. The German city where the survey was carried out is replete with bicycle lanes, while infrastructure and measures to promote safety for cyclists do not exist in Korea and India. Third, the practice of reusing bags in all countries is associated with biospheric values, with the exception of India. With respect to the other values, reusing bags has different associations with values in the different countries, with similarities between Israel and Korea. Finally, the values that shape recycling behaviour are similar in Germany and India, and the values that shape environmental philanthropy are similar only in Korea and India.

DISCUSSION AND CONCLUSIONS

Researchers argue that since values are formed early in life, they are relatively stable and more general than world views, and hence they play an important role in shaping environmental attitudes and behaviours, both directly and indirectly (e.g. De Groot and Steg 2009; Steg and Vlek 2009). This argument suggests that values should demonstrate a consistent effect on environmental behaviour across different countries (De Groot and Steg 2008; Milfont, Duckitt et al. 2010). In this article, we tested the association between selected value types and measures of private- and public-sphere environmental behaviour in four countries. We augmented past research, which used Schwartz's value theory to explain environmental behaviour, by analysing the components of self-transcendence separately (universalism and benevolence), and by including biospheric value and conformity as values that should have significant links with environmental behaviours.

Several conclusions can be drawn from our results and their bearing on our hypotheses. First, our results show that the biospheric value type is the most consistent value in explaining environmental behaviour across countries and behaviours. Second, when all of the values are entered together (Model 5), both our hypotheses – about the separate effects of universalism and benevolence (H1) and about the separate effects of universalism and biospheric values (H2) – were confirmed. In the full model, when items related to nature and the environment are removed from universalism, and measures of biospheric values are added, benevolence and universalism (altruism) no longer showed significant associations with environmental behaviour in most cases. Thus we believe that the three closely linked values – benevolence, universalism and

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biospheric values – should be treated separately in future research about values as the antecedents of environmental action.

It is important to note, however, that when entered as a single value predictor (Model 3), benevolence did have a positive and significant effect on most behaviours and in most countries, quite similar to universalism. A similar trend is observed in comparing the results of Model 1 and Model 2, where biospheric and universalism values behave comparably in their effect on behaviour. These findings partly replicate the results of previous research (e.g. Steg et al. 2005), but also demonstrate that universalism is *not* significant once we control for other values.

Third, when conformity is considered as a single variable, the findings confirm the hypothesis (H3) that conformity is positively linked to environmental behaviours. However, these results are no longer supported in the full model, except for one case: turning appliances off in Germany, which is an interesting finding attesting to cultural differences in the normative adoption of environmentalism. In fact, in some of the measures – for example, recycling and reusing bags in Israel and Korea, and environmental philanthropy in Germany and Israel – we find a *negative* association between conformity and environmental behaviour. Therefore, future studies should further explore the association between the value of conformity and environmental action, both empirically and theoretically, because to date the literature on values and environmental behaviour has ignored this link.

Finally, in terms of cross-national comparison, given that our measures of environmental behaviour refer to typical daily activities in the private sphere, we argued that they are comparable to the extent that any cross-national research is comparable, and we posited that we would find similar associations between values and behaviours across countries (H4). Some interesting conclusions emerge on this matter. For some activities, the patterns of association with values are similar across countries. However, for other activities we do not find a consistent pattern. Hence, we conclude that H4 is unsupported; although there are some distinct and consistent patterns of association between value types and environmental behaviours across countries, largely with regard to the biospheric value type, there are also repeated differences between the countries that merit in-depth exploration in future research.

We found that some values had similar effects in the four countries and that other values operated distinctively in different national contexts. Specifically, the results suggested the cross-cultural validity of the effect of biospheric values, but variations in the effect of the other value dimensions. Thus, taking cultural differences into account may be critical to understanding the ways in which environmental behaviours are predicted and shaped. For example, the varying effects of conformity could possibly be interpreted as indicating that as a society, Israelis are less likely to conform (Hornsey et al. 2003), whereas

Koreans are more traditional and more norm-driven than Europeans (Kim and Markus 1999).

Although many theories emphasise the importance of personal values as an antecedent to environmental attitudes and beliefs, studies often show that the direct effect of values on environmental behaviour is weak, in particular when the outcome variables are specific environmental activities such as recycling rather than summated indices of several behaviours (Miroso et al. 2013). Indeed, we found that the effects of the value types on behaviours, although significant, were relatively small. One explanation for this finding may be that values have to be relevant to specific situations, circumstances and policy fields, or take priority over other values (Lockwood 1999; Maio et al. 2001). Further, values need to be activated by various factors such as locus of control (Engqvist-Jonsson and Nilsson 2014), situational variables and environmental concern (Corraliza and Berenguer 2000) or knowledge of environmental issues (Barr 2007).

For example, biospheric values may be activated when people are confronted with environmental problems. Although the effects are weak, individuals want to behave in accordance with their values because it is rewarding and because values are goal oriented (Sagiv and Schwartz 1995). This is one reason for the importance of analysing the direct effect of different values on behaviour (Roccas and Sagiv 2010).

Future research should examine additional components in the social mechanism that links values and behaviour, and investigate the indirect effects of values on behaviours as well. Doing so will highlight the complexity of the links between values and environmental behaviour by considering the effect that values have on attitudes, beliefs, awareness and environmental self-efficacy, all of which were found, in turn, to shape behaviour.

Other improvements that future research could make are recruitment of a representative sample of the country's entire population and use of a mixed-methods approach. Understandably, our results are limited to the surveyed student population, which may be more predisposed to pro-environmental behaviour. Nevertheless, our main interest is in the associations between values and behaviour within each country, and in this respect the findings give us an understanding of the cross-cultural differences within these populations.

In addition, country differences in values and the effects of values can best be explained when survey research is supplemented by interviews or focus groups where individuals describe the meanings they attribute to various measures of private and public environmental behaviour. Such additional qualitative information is particularly useful in analyses of personal values because it can provide an opportunity to identify what Schwartz (2012) calls value priorities or hierarchies that may be context specific.

In summary, our study offers theoretical support for two important conclusions. First, neither value types nor environmental behaviours should be

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treated in the aggregate. Specific value types have a different effect on environmental behaviours, and the differentiation between various measures of private and public environmental behaviours also seem to play a role. Second, our cross-national analysis suggests that some values may lead to different outcomes in different cultural contexts, while others such as the biospheric value are more robust and less susceptible to cultural differences. Previous cross-country comparative studies have tended to emphasise common rather than different patterns of value influences because they are considered to be universal. However, it may be that values are differentially activated in different countries due to varying cultural and structural characteristics such as the availability, quality, and accessibility of recycling (and other) infrastructures, the price of electricity, the prevalence and effectiveness of environmental NGOs to which people can donate or for whom they can volunteer, and the existence of paths designated for cyclists.

Although individuals' routine practices are produced and reproduced by their values and attitudes, they are rooted in collective cultural systems and country contexts that ascribe meaning to those practices with differing situational variables. An analysis of values and environmental behaviours across contexts provides insights into the processes that shape society and suggests ways to design policies and interventions that are environmentally friendly and have long-term sustainability.

Individual differences in values and the behavioural consequences that follow from holding particular value priorities differ across countries and may offer some suggestions regarding making behavioural changes. If biospheric values are indeed robust and trigger certain pro-environmental values, then policy makers might investigate the antecedents for biospheric values and promote them. It has been argued that biospheric values are heightened and engrained by observing environmental degradation or by a strong dependence on environmental systems (Brechin and Kempton 1994). It is also important to pay attention to the situational factors that might increase the likelihood of acting upon one's biospheric values, such as increasing the attractiveness of pro-environmental behaviours or 'mak[ing] people focus on the environmental consequences of their actions' (Steg et al. 2014: 113).

Communication by policy makers across cultures to promote behaviours that would address climate change should acknowledge shared biospheric values to secure successful outcomes. On the other hand, when values are not associated with behaviours in the same way across cultures, then understanding these differences may help negotiators in dealing with seemingly intractable problems if they are framed in a way that recognises cultural difference and uses them to better shape public perceptions, attributions and judgments.

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