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Value Orientations to Explain Beliefs Related to Environmental Significant Behavior

How to Measure Egoistic, Altruistic, and Biospheric Value Orientations

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In environmental literature it is argued that three different value orientations may be relevant for understanding environmental beliefs and intentions: egoistic, altruistic, and biospheric. Until now, the distinction between altruistic and biospheric value orientations has hardly been supported empirically. In this article, three studies are reported aimed to examine whether an egoistic, altruistic, and biospheric value orientation can indeed be distinguished empirically by using an adapted value instrument. Also, it is examined whether these value orientations are differently and uniquely related to general and specific beliefs and behavioral intention. Results provide support for the reliability and validity of the value instrument. All studies replicated the distinction into three value orientations, with sufficient internal consistency. Furthermore, when altruistic and biospheric goals conflict, they seem to provide a distinct basis for proenvironmental intentions. The value instrument could therefore be useful to better understand relationships between values, beliefs, and intentions related to environmentally significant behavior.

Keywords: *biospheric values; environmental beliefs; values; value instrument*

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Worldwide, the quality of the environment is threatened by problems such as global warming, water pollution, fast decline of forests, and desertification (World Commission on Environment and Development [WCED], 1987). Human behavior is seen as an important contributor to these problems and their solutions (Gardner & Stern, 2002; Nickerson, 2003). *Environmentally significant behavior* (ESB) may be defined as: "the extent to which it changes the availability of materials or energy from the environment or alters the structure and dynamics of ecosystems or the biosphere" (Stern, 2000, p. 408).[1] Various scholars have argued that environmental problems are rooted in human values (Dunlap, Grieneeks, & Rokeach, 1983).

In this article, we argue that there are three relevant value orientations to explain beliefs and intentions related to ESB, that is, egoistic, altruistic, and biospheric value orientations. However, as for now, this distinction has hardly been validated in empirical research. We propose a new instrument to measure these value orientations and report results of three studies that test the reliability and validity of the value instrument.

Values

Recent psychological theories and studies on values are based on the work of Rokeach (1973, 1979) and, more recently, Schwartz (1992, 1994). Schwartz (1992) defines *a value* as: "a desirable transsituational goal varying in importance, which serves as a guiding principle in the life of a person or other social entity" (p. 21). This definition includes most of the agreed on key features of values. First, a value reflects a belief on the desirability of a certain end-state. Or, as Allport (1963) put it: "A value is a belief upon which a man acts by preference" (p. 454). Second, values are rather abstract and therefore transcend specific situations. Third, values serve as a guiding principle for selecting or evaluating behavior, people, and events. And finally, values are ordered in a system of value priorities. This feature implies that when different competing values are activated in a specific situation, choices are based on values that are considered to be most relevant to act on.

The characteristics of values illustrate at least two reasons why it is important to study values. First, it has been theoretically reasoned and empirically validated that values play a significant role in explaining specific beliefs and behavior and can therefore be used as predictors for various variables such as attitudes and behavioral intentions (Stern, 2000; Stern & Dietz, 1994). Second, the total number of values that people may consider is relatively small. Therefore, relative to other antecedents of behavior (e.g., specific beliefs, attitudes), values provide an economically efficient instrument for

describing and explaining similarities and differences between persons, groups, nations, and cultures (Rokeach, 1973).

Value Orientations in Environmental Research

In environmental psychology, various studies have been conducted to examine the relationship between values, general and specific beliefs,[2] intentions, and ESB (Gärling, Fujii, Gärling, & Jakobsson, 2003; Joireman, Lasane, Bennett, Richards, & Solaimani, 2001; Nordlund & Garvill, 2002, 2003; Schultz & Zelezny, 1998; Stern & Dietz, 1994; Stern, Dietz, Abel, Guagnano, & Kalof, 1999). Most of these studies were based on Schwartz's (1992, 1994) universal value system or on social value orientations as proposed in the social dilemma literature (McClintock, 1972; Messick & McClintock, 1968). In this section, these theoretical frameworks are discussed and relevant empirical studies are reviewed.

Schwartz (1992, 1994) proposed a general classification of 56 values. Respondents had to rate each of these values on a 9-point scale reflecting the relative importance of these values as "a guiding principle in one's life." From data collected in 44 countries, with a total of 97 samples and 25,863 respondents, 10 motivational types of values emerged based on an individual-level analysis. These 10 value types can be plotted in a two-dimensional space that comprises four separate value clusters. The first dimension, openness to change versus conservatism, distinguishes values that stress independence, such as self-direction and stimulation, from values that emphasize tradition and conformity. The second dimension distinguishes social or self-transcendent values, such as universalism and benevolence, from those that pursue personal interests or self-enhancement, such as power and achievement. This dimension is labeled as self-transcendence versus self-enhancement. Research shows that especially the self-transcendent versus self-enhancement dimension is related to different kinds of beliefs and ESB (Nordlund & Garvill, 2002; Stern, 2000; Thøgersen & Ölander, 2002).

In social dilemma research, a distinction is made between prosocials or cooperators and proselves or noncooperators (Gärling, 1999; Gärling et al., 2003; Joireman et al., 2001; Van Vugt, Van Lange, & Meertens, 1996). People having a prosocial value orientation focus on optimizing outcomes for others, whereas people with a proself value orientation focus on optimizing outcomes for themselves. Various social dilemma studies have studied the role of value orientations in explaining behavior (e.g., Liebrand, 1984; Kramer, McClintock, & Messick, 1986; Parks, 1994; Van Lange & Liebrand, 1989). In studies on ESB, it appeared that people who give

priority to collective, or prosocial, values have stronger proenvironmental beliefs and are more willing to engage in diverse types of ESB than people who give priority to individual or proself values (Cameron, Brown, & Chapman, 1998; Gärling et al., 2003; Joireman et al., 2001; Joireman, Van Lange, Kuhlman, Van Vugt, & Shelley, 1997; Van Vugt, Meertens, & Van Lange, 1995).

The distinction between prosocials and proselves is comparable to the distinction between self-transcendence versus self-enhancement value orientations made by Schwartz (Gärling, 1999; Stern & Dietz, 1994). Because people consider only few values when making behavioral choices, studies on environmental beliefs, intentions, and behavior may best focus on self-transcendence versus self-enhancement values.

Toward a Biospheric Value Orientation

In literature on environmental ethics, various scholars argued that besides a self-transcendent versus self-enhancement value orientation, a third value orientation should be distinguished that emphasizes the intrinsic value of nature (Leopold, 1949; Naess, 1989; Reid, 1962; Singer, 1975). For example, in *Radical Ecology*, Merchant (1992) distinguishes three ethics involved in land and natural resource dilemmas, namely an egocentric, a homocentric, and an ecocentric ethic. An egocentric ethic is based on an individual ground. It implies that individuals are entitled to extract and use natural resources to enhance their own lives and those of other members of society. A homocentric, or anthropocentric, ethic is grounded in society and implies that the social good should be maximized and human evil minimized. An ecocentric ethic is based in the ecosystem or cosmos and implies that all things in the ecosystem have intrinsic value and deserve moral consideration. These ethics show in their definitions a close link to values.

Other scholars have proposed a similar distinction into three value orientations (Axelrod, 1994; Stern & Dietz, 1994). For example, Stern (2000; Stern & Dietz, 1994; Stern, Dietz, & Kalof, 1993) argued that three different value orientations may affect beliefs related to ESB and ESB: an egoistic, a social-altruistic, and a biospheric value orientation. People with an egoistic value orientation will especially consider costs and benefits of ESB for them personally: When the perceived benefits exceed the perceived costs they will have an environmentally friendly intention and vice versa. People with a social-altruistic value orientation will base their decision to behave proenvironmentally or not on perceived costs and benefits for other people. Finally, people with a biospheric value orientation will mainly base

their decision to act proenvironmentally or not on the perceived costs and benefits for the ecosystem and biosphere as a whole. Although all three value orientations provide a distinct basis for (beliefs related to) ESB, in general proenvironmental beliefs, intentions, and behavior appear to be positively related to social-altruistic and/or biospheric values and negatively to egoistic values (Stern & Dietz, 1994; Stern, Dietz, & Guagnano, 1998; Van Vugt et al., 1995).

Based on the above, one may assume that there is at least a theoretical ground for a separate biospheric value orientation. Empirically, however, in many studies this value orientation could not be distinguished from the altruistic value orientation. This becomes clear in the next section.

Empirical Validation of an Existence of a Biospheric Value Orientation

Most studies fail to show a distinction between an altruistic and a biospheric value orientation (Bardi & Schwartz, 2003; Corraliza & Berenguer, 2000; McCarty & Shrum, 1994; Nordlund & Garvill, 2002; Stern & Dietz, 1994). Generally, only two value orientations are found, that is, self-transcendent versus self-enhancement (Stern et al., 1998). This may be due to the selection of values included in the studies. For example, in studies based on Schwartz's value theory only few biospheric value items are included; consequently, it will be difficult to find a separate biospheric value orientation via factor analyses.

A few empirical studies did reveal a distinction between biospheric and altruistic values via exploratory principal component analyses (PCA; García Mira, Real Deus, Durán Rodríguez, & Romay Martínez, 2003; Karp, 1996; Nilsson, Von Borgstede, & Biel, 2004) or by constructing value scales via reliability analyses (Stern et al., 1998). For example, Stern et al. (1998) were able to construct separate altruistic and biospheric value scales, each having acceptable reliabilities. However, the distinction between these value clusters was not empirically validated via confirmatory factor analyses (CFA).

Based on the above, it is hard to draw conclusions on whether or not it is useful to distinguish three value orientations instead of two. Theoretically, a distinction between three value concepts seems clear and useful. Empirically, there is only little and contradictory support for a distinction between biospheric and altruistic value orientations. As yet, most studies employed exploratory PCA, or constructed altruistic and biospheric value scales via reliability analyses without examining the underlying factor structure. However, to draw solid conclusions about the distinction between

egoistic, altruistic, and biospheric values, CFA should be employed because CFA is aimed at validating distinctions between factors defined on theoretical grounds. Furthermore, it should be examined whether the same pattern of results is replicated in studies across different samples to further validate this distinction (McCrae, Zonderman, Costa, Bond, & Paunonen, 1996). Also, it should be studied whether the resulting value scales are related to specific environmental beliefs and intentions in the expected way. In this article, we address these exact issues.

Following Stern and colleagues (Stern et al., 1999; Stern et al., 1998), we propose a brief value instrument that is easy to administer in empirical studies. The value instrument comprises values most relevant to understand (beliefs related to) ESB, that is, egoistic, altruistic, and biospheric values. We present results of three studies aimed to examine whether the three value orientations can indeed be distinguished empirically. Also, it is examined whether these value orientations are differently related to beliefs and intention related to ESB.

Study 1

The first study aimed to examine whether a newly developed value instrument could reliably distinguish three value orientations. Specifically, it was examined whether a separate biospheric value orientation could be distinguished from an altruistic one. Second, the validity of the value instrument was tested by relating the three value orientations to general and specific beliefs related to ESB. In line with the value-belief-norm (VBN) theory (Stern, 2000), we assumed a causal chain of variables influencing ESB, from general values to environmental concern (i.e., general beliefs), which in turn affect behavioral specific beliefs, such as problem awareness and ascription of responsibility, which are supposed to be related to personal norms and behavior. In Study 1, we focused on relationships between values, environmental concern, problem awareness, and ascription of responsibility. Various studies revealed that the general and specific beliefs included in Study 1 are related to different types of ESB (Bamberg & Schmidt, 2003; Hopper & Nielsen, 1991; Steg, Drijerink, & Abrahamse, 2005; Stern & Dietz, 1994; Vining & Ebreo, 1992).

Procedure and Respondents

In 2003, a survey study was conducted on factors affecting the acceptability of energy policies following VBN theory (Steg et al., 2005). The

study comprised questions on egoistic, altruistic, and biospheric values and questions on environmental concern, problem awareness, and ascription of responsibility.[3] Three hundred questionnaires were distributed at different locations in Groningen, a city in the northern part of The Netherlands. A total of 112 respondents returned a completed questionnaire, of which 52 males and 58 females ranging in age from 19 to 81 years ($M = 39.82$, $SD = 16.40$). The response rate was 39%.

Measures

Value orientations. Measures of value orientations were based on a short version of Schwartz's value scale (1992) conceived by Stern and colleagues (Stern et al., 1999). They selected 23 values from Schwartz's scale and included some additional biospheric value items. The short version included values that belonged to the self-transcendence versus self-enhancement and the openness to change versus conservation dimensions of Schwartz's value theory. Because we were particularly interested in the self-transcendence versus self-enhancement dimension, we selected values that belonged to this dimension only. This selection included 11 values: 4 to measure the egoistic value orientation, 3 to measure the altruistic value orientation, and 4 to measure the biospheric value orientation. To obtain an equal amount of items per construct, it was decided to include one extra altruistic value item that appeared to increase the internal consistency of this scale in previous research (Stern et al., 1998). Thus, the resulting value scale consisted of 12 value items (see Table 1). In line with Schwartz, respondents rated the importance of these 12 values "as a guiding principle in their lives" on a 9-point scale ranging from –1 *opposed to my values*, 0 *not important*, to 7 *extremely important*. Following Schwartz, respondents were urged to vary the scores and to rate only few values as extremely important.

Environmental concern. The revised New Environmental Paradigm scale (NEP; Dunlap, Van Liere, Mertig, & Jones, 2000) was used to measure environmental concern. Respondents rated to what extent they agreed with 15 items on the relationship between humans and the environment on a scale ranging from 1 *totally disagree* to 5 *totally agree*. The internal consistency of this scale was .73 ($M = 3.46$, $SD = .40$).

Behavioral specific beliefs. Respondents rated to what extent they agreed with six items reflecting awareness of environmental problems related to energy use (awareness of consequences; AC). Examples are:

Table 1
Corrected Correlations Between Value Items and Components via
Multiple Group Method

Value Item	Egoistic	Altruistic	Biospheric
Egoistic value orientation			
1. Social power: control over others, dominance	.47	–.19	–.09
2. Wealth: material possessions, money	.46	–.22	–.08
3. Authority: the right to lead or command	.50	–.18	–.08
4. Influential: having an impact on people and events	.33	–.10	–.08
Cronbach's alpha = .65			
Altruistic value orientation			
5. Equality: equal opportunity for all	–.06	.54	.45
6. A world at peace: free of war and conflict	–.23	.53	.26
7. Social justice: correcting injustice, care for the weak	–.09	.45	.44
8. Helpful: working for the welfare of others	–.35	.55	.30
Cronbach's alpha = .72			
Biospheric value orientation			
9. Preventing pollution: protecting natural resources	–.22	.49	.68
10. Respecting the earth: harmony with other species	–.08	.34	.65
11. Unity with nature: fitting into nature	.10	.38	.59
12. Protecting the environment: preserving nature	–.19	.39	.73
Cronbach's alpha = .83			

Note: Correlations are corrected for "self-correlations."

"Global warming is a problem for society" or "Energy savings help to reduce global warming." Respondents also indicated to what extent they agreed with six items reflecting whether they feel responsible for these problems (Ascription of Responsibility; AR). This scale included items such as "I feel jointly responsible for the exhaustion of energy resources" or "My contribution to the energy problems is negligible." AC and AR items were put in randomized order together with nine items focusing on personal norms not discussed in this article. Scores could range from 1 *fully disagree* to 5 *fully agree*. Mean scores were computed on items included in each scale. The internal consistency was .75 for AC ($M = 3.81$, $SD = .58$) and .80 for AR ($M = 3.40$, $SD = .68$), respectively.

Results

The multiple group method (MGM), a simple and effective type of CFA (Guttman, 1952; Hendriks & Kiers, 1999; Kiers, 1990; Nunnally, 1978;

Stuive, Kiers, Timmerman, & Ten Berge, 2006; Ten Berge, 1986; Ten Berge & Siero, 2001) was used to verify whether the data supported the groupings of aspects into the three value orientations that were identified on theoretical grounds. Here, these components were egoistic values, altruistic values, and biospheric values. In the MGM, following the procedure of Nunnally (1978), we first defined components (i.e., value scales) on theoretical grounds. For this purpose, we computed the mean score of value items supposedly related to the value scales. Next, correlations were computed between value items and the three components (i.e., value scales). For items included in a scale, the correlation coefficients were corrected for "self-correlation," that is, the fact that items automatically correlate high with components in which they take part. Finally, we verified whether the value items indeed correlated highest with the component to which they are assigned on theoretical grounds. It is assumed that the factor structure (i.e., the grouping of value items into the three value orientations) is supported when items correlate highest with the component they are assigned to on theoretical grounds after correcting for self-correlations (see Nunnally, 1978).[4] Furthermore, explained variances of the components are also presented to provide more information about the factor structure.

Results confirmed the grouping of the value items into three value orientations (see Table 1). Each value item correlated strongest with the value orientation it was assigned to on theoretical grounds. These results suggest that the three value orientations could be clearly distinguished. The altruistic value items correlated positively with the biospheric value orientation, and the biospheric items correlated positively with the altruistic value orientation. Also, the altruistic and biospheric value orientations appeared to be correlated quite strongly ($r = .48$, $p < .001$). Yet, although altruistic and biospheric values are related, MGM revealed that they can be clearly distinguished from each other. Correlations between the altruistic and egoistic value orientation and between the biospheric and egoistic value orientation were $r = -.24$ ($p < .05$) and $r = -.11$ ($p = .25$), respectively. The Cronbach's alpha for each of the value scales was acceptable or good: .65 for the egoistic ($M_{ego} = 1.6$, $SD = 1.1$), .72 for the altruistic ($M_{altr} = 5.2$, $SD = 1.0$), and .83 for the biospheric value orientation ($M_{bio} = 4.4$, $SD = 1.1$; see Table 1). Furthermore, explained variances for the egoistic, biospheric, and altruistic value orientation were sufficient as well, with variances ranging from 49% for the egoistic, 55% for the altruistic, and 67% for the biospheric value orientation.

Three regression analyses were carried out to examine whether the three value orientations were related to NEP, AC, and AR, respectively (see Table 2).

Table 2
Multiple Regression Analyses to Test the Relationships Between Value Orientations, New Environmental Paradigm (NEP), Awareness of Consequences (AC), and Ascription of Responsibility (AR)

	β	*t*	R²	Adjusted R²	*df*	*F*
Dependent variable: NEP			.27	.25	3, 102	12.74***
Egoistic	–.32	–3.63***				
Altruistic	–.20	–2.02*				
Biospheric	.47	4.89***				
Dependent variable: AC			.14	.11	3, 102	5.41**
Egoistic	–.26	–2.69**				
Altruistic	.07	.61				
Biospheric	.19	1.77				
Dependent variable: AR			.22	.20	3, 102	9.51***
Egoistic	–.17	–1.80				
Altruistic	.15	1.48				
Biospheric	31	3.09**				

*$p < .05$. **$p < .01$. ***$p < .001$.

Value orientations explained 27% of the variance in NEP, $F(3, 102) = 12.74$, $p < .001$. Egoistic and biospheric value orientations made a significant contribution to this model. The more respondents subscribe to egoistic values, the lower their environmental concern (egoistic: $β = –.32$, $p < .001$). Furthermore, the more respondents value the environment and biosphere, the stronger their environmental concern ($β = .47$, $p < .001$). Altruistic value orientations were negatively related to environmental concern when the other value orientations were controlled for ($β = –.20$, $p < .05$). However, bivariate correlational analysis revealed that altruistic values were not significant related with NEP ($r = .10$, $p = .295$), pointing to a suppressor effect.

Value orientations contributed significantly to the explanation of the variance in AC, $R² = .14$, $F(3, 102) = 5.41$, $p < .01$, and AR, $R² = .22$, $F(3, 102) = 9.51$, $p < .001$. Respondents who scored high on egoistic values were less aware of environmental problems related to energy use than respondents who scored low on this value orientation ($β = –.26$, $p < .01$). Neither the biospheric nor the altruistic value orientation contributed significantly to this model. Furthermore, respondents who strongly value environmental qualities (biospheric value orientation) felt more responsible for problems related to energy consumption compared to respondents having a weaker biospheric value orientation ($β = .31$, $p < .01$). Egoistic and altruistic value orientations did not significantly contribute to the explanation of AR.

Conclusions

MGM supported the distinction between the three value orientations. Altruistic value items appeared to be correlated with the biospheric value orientation, and biospheric value items with the altruistic value orientation. This finding is consistent with earlier studies that used Schwartz's value theory (1992). Still, MGM revealed that the value items correlated most strongly with the value orientation they were assigned to on theoretical grounds, supporting the three-way value distinction. The internal consistency of the scales was acceptable or good, although the internal consistency of the egoistic value orientation (.65) could be improved. Explained variances were sufficient for all three value orientations.

Value orientations contributed strongly to the explanation of environmental concern and were less strongly related to specific environmental beliefs (AC and AR). This result is in line with the VBN theory (Stern, 2000), which assumes that values typically affect behavioral specific beliefs (such as AC and AR) indirectly, via general beliefs, such as NEP.

Not all three value orientations made a unique and significant contribution to the explanation of AC and AR. Only egoistic values contributed significantly to the explanation of AC, whereas only biospheric value orientations contributed significantly to the explained variance of AR. Regression analysis revealed that all three value orientations made a unique contribution to the explanation of NEP. However, the significant relationship between altruistic values and NEP could be a statistical artifact. We further examine this in Study 3.

In conclusion, MGM supports the distinction between the three value orientations. Of course, this finding should be replicated; we try to do so in Study 2 and 3. The values were differently related to beliefs, although altruistic and biospheric values do not seem to make a unique contribution. Therefore, construct validity should be further examined by exploring whether altruistic and biospheric values contribute uniquely to beliefs related to ESB. We elaborate on this in Study 3.

Study 2

Study 2 was aimed to replicate the results of Study 1 on the distinction between three value orientations using a different, larger, and more diverse sample. Second, we strived to increase the internal consistency of the egoistic value scale by including an extra egoistic value item.

Procedure and Respondents

An Internet survey was conducted in five different countries (i.e., Austria, Czech Republic, Italy, the Netherlands, and Sweden) in 2004 and the beginning of 2005. The current study was part of a larger study that examined the effects of transport policies on life quality.[5] In every country, the questionnaire was translated into the native language. After a language check, they were distributed by e-mail: Acquaintances, family, and colleagues of members of the research team were sent a link to the questionnaire on the Web. Respondents were told that the questionnaire comprised questions about their opinion on the effect of transport policies on their quality of life. They were requested to fill out the questionnaire and were asked to send the link to as many other persons as possible to reach a varied sample (snowball method).

In this article, the full data set is used.[6] A total of 490 respondents returned the questionnaire, of which 93 were Austrian, 106 were Czech, 71 were Italian, 151 were Dutch, and 69 were Swedish. The response rate is not known because the snowball method was used. Forty-five percent of the respondents were male, and 55% were female. Respondents' age ranged from 17 to 72 years ($M = 38.21$, $SD = 12.75$). One respondent did not fill out the full questionnaire and was excluded from further analyses. The sample is probably not representative for the five participating countries. However, we aimed to recruit a heterogeneous sample; for example, respondents from different age groups, regions, and income levels, to secure variation in the variables of interest.

Method

Value orientations. Based on the results of Study 1, an extra egoistic value item was included to increase the internal consistency of the egoistic value scale (i.e., "ambitious": hard-working, aspiring). Previous research revealed that this item was strongly correlated with the other egoistic items (see Collins, Steg, & Koning, in press). The resulting value scale consisted of 13 value items: 5 items for the egoistic, 4 items for the altruistic, and 4 items for the biospheric value orientation (see Table 3).

Results

MGM was used to validate the distinction between three value orientations. Results of the total sample of 489 respondents confirmed the grouping of the value items into three value orientations (see Table 3). Again, all

Table 3
Corrected Correlations Between Value Items and Components via
Multiple Group Method (_N_ = 489)

Value Item	Egoistic	Altruistic	Biospheric
Egoistic value orientation			
1. Social power	.50	−.09	−.02
2. Wealth	.50	−.05	−.07
3. Authority	.59	−.10	−.14
4. Influential	.52	.09	.07
5. Ambitious	.45	.10	.01
Cronbach's alpha = .74			
Altruistic value orientation			
6. Equality	−.09	.51	.30
7. A world at peace	.03	.44	.43
8. Social justice	−.05	.63	.35
9. Helpful	.08	.49	.30
Cronbach's alpha = .73			
Biospheric value orientation			
10. Preventing pollution	−.11	.44	.71
11. Respecting the earth	.00	.31	.68
12. Unity with nature	.00	.41	.76
13. Protecting the environment	−.05	.43	.72
Cronbach's alpha = .86			

Note: Correlations are corrected for "self-correlations."

value items correlated strongest with the value orientation to which they were assigned to on theoretical grounds. As in Study 1, altruistic value items correlated positively with the biospheric value orientation, biospheric items correlated positively with the altruistic value orientation, and altruistic and biospheric value orientations were correlated ($r = .46$, $p < .001$). Correlations between the altruistic and egoistic value orientation ($r = −.02$) and between the biospheric and egoistic value orientation ($r = −.05$) were not significant. MGM revealed that the egoistic, altruistic, and biospheric value orientations could be clearly distinguished. Compared to Study 1, the Cronbach's alpha for the egoistic value orientation increased with .09 (alpha = .74, $M_{ego} = 2.5$, $SD = 1.2$). Cronbach's alpha for the altruistic and biospheric value orientations were comparable to Study 1 (alpha$_{altr}$ = .73, $M_{alt} = 5.1$, $SD = 1.1$; alpha$_{bio}$ = .86, $M_{bio} = 5.0$, $SD = 1.3$). The egoistic values explained 50% variance of the egoistic value orientation, the altruistic values explained 55% variance of the altruistic value orientation, and the biospheric values explained 71% variance of the biospheric value orientation.

Conclusions

Again, results of the MGM show that the value instrument differentiates between three value orientations, even though altruistic and biospheric value items are correlated. These results provide further support for distinguishing altruistic and biospheric value orientations, hereby replicating the results of Study 1 using a different, cross-national sample. Furthermore, the internal consistency of the egoistic value scale was improved to a sufficient level by including an extra egoistic value item. Also, explained variances of the three scales were good.

Study 3

The aim of Study 3 was threefold. The first aim was to replicate the clustering of 13 values into three value orientations. The second aim of Study 3 was to further examine the construct validity of the instrument by relating value orientations to other behavioral specific beliefs (i.e., attitudes toward recycling) and intentions to donate to humanitarian versus environmental organizations. We investigated relationships between values and donating intention to examine whether altruistic and biospheric values contribute uniquely to intention when altruistic and biospheric goals conflict. It was hypothesized that people who are more altruistically oriented more strongly intend to donate to humanitarian organizations, whereas biospherically oriented people more strongly intend to donate to environmental organizations. The third aim was to examine how the three value orientations are related to environmental concern (NEP) because the results of Study 1 pointed to a statistical artifact.

Procedure and Respondents

In February 2005, an Internet survey was conducted among students of the University of Groningen. Students from different faculties and departments were approached in computer classrooms to recruit a heterogeneous group of students. They were asked whether they were willing to participate in a study aimed to test different scales that are used in environmental psychology. The survey comprised questions about values, environmental concern, attitudes on recycling behavior, and intentions to donate to humanitarian versus environmental organizations. Questionnaires were completed via Internet: Students were approached in computer classrooms and were asked to fill out

the questionnaire on the university computers. A total of 184 respondents returned a completed questionnaire, of which 94 were males and 89 were females. The mean age was 22.49 years ($SD = 3.07$).

Measures

Value orientations. The same value instrument as used in Study 2 was included in the survey of Study 3.

Environmental concern. The revised NEP scale was used to measure environmental concern (see Study 1). The internal consistency of this scale was .76 ($M = 3.48$, $SD = .46$).

Attitude toward recycling. The survey included six bipolar semantic differential items to measure attitude toward recycling behavior. Respondents indicated whether they think recycling paper, chemical disposal, and glass is bad–good, unnecessary–necessary, negative–positive, not fun–fun, unimportant–important, useless–useful on 7-point scales. Scores on each item were averaged, and resulting scores on recycling attitude could range from 1 *unfavorable* to 7 *favorable*. The scale showed high reliability with an alpha of .84 ($M = 5.58$, $SD = .93$).

Donating intention. Donating intention was measured by asking respondents whether they would rather donate to a humanitarian or an environmental organization. The question was, "Suppose you have 10 Euro that you are willing to donate to charity. Which organization would you choose in the following five situations?" In each case, respondents were given a choice between a humanitarian or an environmental organization. Each pair of organizations was comparable with respect to degree of internationalization of aid, publicity, and aim. A short description of the mission of each organization was included. An example: "If I have to donate 10 Euro to charity, then I would choose: UNICEF or WWF." Scores on intention to donate were computed by summing up the number of times someone chose a humanitarian organization. This scale score could range from 0 *no donations to humanitarian organizations, all donations to environmental organizations* to 5 *all donations to humanitarian organizations, no donations to environmental organizations*. A score of *2* would mean that of the five times, respondents had chosen a humanitarian organization twice. The mean score was 3.36 ($SD = 1.14$) indicating that on average respondents tended to donate somewhat more to humanitarian organizations compared to environmental organizations.

Table 4
Corrected Correlations Between Value Items and
Components via Multiple Group Method (N = 184)

Value Items	Egoistic	Altruistic	Biospheric
Egoistic value orientation			
1. Social power	.68	−.27	−.06
2. Wealth	.53	−.14	.05
3. Authority	.63	−.03	.04
4. Influential	.60	−.08	.01
5. Ambitious	.52	−.09	−.10
Cronbach's alpha = .83			
Altruistic value orientation			
6. Equality	−.19	.54	.37
7. A world at peace	−.14	.50	.39
8. Social justice	−.15	.66	.44
9. Helpful	.01	.42	.32
Cronbach's alpha = .74			
Biospheric value orientation			
10. Respecting the earth	−.16	.53	.66
11. Unity with nature	.08	.26	.56
12. Protecting the environment	.01	.47	.71
13. Preventing pollution	.01	.42	.71
Cronbach's alpha = .83			

Note: Correlations are corrected for "self-correlations."

Results

Again, MGM showed that the egoistic, altruistic, and biospheric value items could be clearly separated into three value orientations (see Table 4). As in Study 1 and 2, altruistic value items were correlated to the biospheric value orientation, and biospheric value items to the altruistic value orientation. Correlation between the altruistic and biospheric value orientation was quite strong ($r = .51$, $p < .001$). Correlation between altruistic and egoistic value orientations was also significant ($r = −.16$, $p < .05$). The biospheric and egoistic value orientation were not significantly correlated ($r = −.02$, $p = .40$). Alpha reliabilities were high: .83 for the egoistic ($M_{ego} = 3.0$, $SD = 1.3$), and the biospheric value orientation ($M_{bio} = 3.8$, $SD = 1.3$), and .74 for the altruistic value orientation ($M_{altr} = 4.9$, $SD = 1.1$). Explained variances for the egoistic, biospheric, and altruistic value orientation were high, with variances ranging from 59% for the egoistic, 56% for the altruistic, and 68% for the biospheric value orientation.

Table 5
Multiple Regression Analyses to Test Relationships Between Value Orientations, New Environmental Paradigm (NEP), Attitudes Toward Recycling, and Donating Intention

	β	*t*	R²	Adjusted R²	*df*	*F*
Dependent variable: NEP			.30	.29	3, 180	25.75***
Egoistic	−.15	−2.37*				
Altruistic	.09	1.20				
Biospheric	.47	69.46***				
Dependent variable: Attitude			.08	.06	3, 180	4.95**
Egoistic	−.20	−2.78**				
Altruistic	.04	.41				
Biospheric	.16	1.89				
Dependent variable: Donating intention			.23	22	3, 180	18.10***
Egoistic	.04	.55				
Altruistic	.41	5.36***				
Biospheric	−.54	−7.08***				

*$p < .05$. **$p < .01$. ***$p < .001$.

Three separate regression analyses were conducted to examine whether the three value orientations were related to NEP, attitudes toward recycling, and donating intention (see Table 5). Value orientations explained 30% of the variance in NEP. The biospheric value orientation was most strongly related to NEP (β = .47, $p < .001$). The more respondents ascribe to biospheric values, the more they are concerned with the environment. The egoistic value orientation contributed significantly to the explanation of environmental concern in an opposite direction (β = −.15, $p < .05$): the more people ascribe to egoistic values, the less they are concerned with the environment. The altruistic value orientation did not significantly contribute to this model.

Second, value orientations contributed significantly to the explanation of the variance in attitudes toward recycling, R² = .08, $F(3, 180) = 4.95$, $p < .01$. Only the egoistic value orientation contributed significantly to this model ($β_{ego} = -.20$, $p < .01$). Respondents who scored high on egoistic values had a more negative attitude toward recycling than people who scored low on this value orientation.

Third, donating intention could significantly be explained by value orientations, R² = .23, $F(3, 180) = 18.10$, $p < .001$. As expected, only the altruistic and biospheric value orientations contributed to this model ($β_{altr} = .41$,

$p < .001$ and $\beta_{bio} = -.54$, $p < .001$, respectively). The more people were altruistically oriented, the more they intended to donate to humanitarian organizations. In contrast, the more people valued the biosphere and environment, the less they intended to donate to humanitarian organizations and the more they preferred to donate to environmental movements.

Conclusions

The results of Study 3 once again replicated the clustering of 13 values into three value orientations with strong reliabilities and high explained variances for the egoistic, altruistic, and biospheric value orientations, using yet a different sample. Although biospheric and altruistic values were correlated, MGM provided further support for distinguishing altruistic and biospheric value orientations. As in Study 2, the internal consistency of the egoistic value scale was high, again suggesting that the inclusion of the extra egoistic value item enhances the reliability of this scale.

The validity of the instrument was examined by relating value orientations to another set of behavioral specific beliefs, that is, attitudes toward recycling and donating intentions. Results showed that values made a significant contribution to the explanation of both variables. The value orientations explained a small but significant proportion of the variance in attitudes toward recycling, with egoistic value orientations contributing to the explanation of recycling attitude only. Intention to donate to humanitarian versus environmental organizations, a measure that was especially developed to examine the construct validity of the instrument, was related to altruistic and biospheric value orientations in the expected way, that is, altruistically oriented people more strongly intended to donate to humanitarian organizations, whereas biospherically oriented people had a stronger intention to donate to environmental organizations. These results provide some first support for the proposition that altruistic and biospheric value orientations can make a strong and unique contribution to the explanation of environmental beliefs and behavioral intentions. This appears to be especially true when altruistic and biospheric goals conflict.

Study 1 showed some inconsistent results concerning the relationship between value orientations and NEP, that is, regression analysis revealed that all three value orientations made a unique contribution to the explanation of NEP, whereas no significant correlation was found between the altruistic value orientation and NEP. We assumed this was due to a statistical artifact. Results of Study 3 support this conclusion, that is, in Study 3 only the egoistic and

biospheric value orientations contribute to the explanation of NEP. In Study 1 and 3 value orientations explained a similar proportion of the variance in NEP.

Discussion

In this article, an adapted value instrument was proposed to distinguish three different value orientations that are believed to be relevant in theories and ethics related to the environment and ESB. The results of the three studies support the reliability and validity of the value instrument that distinguishes egoistic, altruistic, and biospheric value orientations. The three studies replicated the distinction into three value orientations despite the fact that quite different samples were used. In each study, MGM clearly supported the distinction between three value orientations. Although altruistic and biospheric values were correlated, altruistic values correlated most strongly with the altruistic value scale, and biospheric values with the biospheric value scale, as expected. The internal reliability of the three value scales was sufficient to good, especially after the inclusion of an extra egoistic item in Study 2 and 3. Explained variances for all value orientations were high as well. Furthermore, in general, the value orientations were related to beliefs and intentions in the expected way. Study 3 gave some initial support for the claim that altruistic and biospheric value orientations provide a distinct basis for different environmental beliefs and behavioral intentions. More specifically, altruistic and biospheric values both may be related to beliefs and intentions when altruistic and biospheric goals conflict. This instrument could therefore be useful when studying relationships between values, general and specific beliefs, intentions, and ESB. Until now, most value studies have failed to show this theoretically founded three-way classification of value orientations.

In most cases, the egoistic and biospheric value orientations were related to environmental beliefs and intentions, when the other values were controlled for. The altruistic value orientation did only contribute uniquely to the explanation of NEP in Study 1 and the donating intention in Study 3. The contribution of the altruistic value orientation to the explanation of NEP was small but significant in Study 1; however, this result was not replicated in Study 3. This finding was probably due to a statistical artifact. One possible reason for the result that altruistic and biospheric value orientations do not contribute uniquely to the explanation of some of the beliefs is that altruistic and the biospheric value orientations are correlated, which

makes it less likely that both contribute to the explanation of environmental beliefs and intentions uniquely. However, results of Study 3 reveal that when a choice between environmental and altruistic goals is forced, as in the intention to donate to humanitarian versus environmental organizations, altruistic and biospheric value orientations contribute uniquely to the explanation of environmental intentions. Thus, although altruistic and environmental values may be correlated, they seem to be clearly differently related to environmental beliefs and intention when altruistic and biospheric goals conflict.

Obviously, the value instrument needs further validation to clarify which value orientations are most strongly related to environmental beliefs, intentions, and ESB in specific situations, especially because our samples might not have been fully representative. Results revealed that the predictive power of each value orientation depends on which belief is being explained, which is consistent with other studies that show that the relative importance of values in explaining beliefs varies across different types of beliefs (Nordlund & Garvill, 2002, 2003; Schultz & Zelezny, 1999; Stern, 2000; Stern & Dietz, 1994; Thøgersen & Ölander, 2002). However, the current results suggest that, at least in some situations, there are reasons to believe that all three value orientations may contribute significantly to the explanation of different environmental relevant beliefs and intentions. Similar to donating intention (Study 3), which focused on a conflict between altruistic and the biospheric value orientations only, it is likely that in other choice situations all three value orientations may have a unique relationship with beliefs and intentions related to ESB and ESB. For example, buying "normal," fair-trade, or biological food or choosing between a liberal, social, or "green" political party could induce a similar conflict between egoistic, altruistic, and biospheric values.

Because we aimed to develop a brief value instrument that is easy to administer, only a limited number of value items were included. Some motivational types as defined in Schwartz's value theory (1994) are slightly underrepresented compared to others. For example, the short instrument includes only one item (i.e., helpful) of the benevolence motivational type. The three other altruistic value items are related to the universalism motivational type (i.e., equality, a world at peace, and social justice). Underrepresenting specific motivational types, such as the benevolence values, may limit our understanding of environmental beliefs, intentions, and behavior as far as such values are associated with beliefs, intentions, and ESB. However, there is evidence that universalism values are more strongly related to social and environmental behavior than are benevolence values

(Axelrod, 1994; Gärling, 1999). It is interesting to note that biospheric values also belong to the universalism cluster, that is, seven of eight of the altruistic and biospheric values items of the proposed value instrument may be typified as universalism. Therefore, the moderate to strong correlations between the altruistic and biospheric values described in this article are in line with Schwartz's value theory (1994). This feature makes the outcomes of the studies reported here even more convincing because an empirical distinction in all three studies was found between altruistic and biospheric values belonging to the one and same motivational type of Schwartz's value scale. Moreover, altruistic and biospheric values seem to contribute uniquely to the explanation of environmental beliefs and intentions when altruistic and biospheric goals conflict.

Furthermore, the value instrument included only items from the self-transcendent versus self-enhancement dimension of Schwartz's value theory. Some studies revealed that environmental beliefs, intentions, and ESB may be related to other value clusters as well, such as the openness-to-change value cluster (Karp, 1996). However, this evidence is not univocal, and value clusters based on the self-transcendence versus self-enhancement dimension still seem to be most strongly related to beliefs and intentions related to ESB (Stern et al., 1998). By focusing on two value clusters only, the value instrument is brief and easier to administer in more encompassing studies compared to the full 56-item scale of Schwartz or other extensive value scales including more items and/or more value clusters.

In conclusion, this article supports the distinction between egoistic, altruistic, and biospheric value orientations. Future studies should further validate the value instrument and reveal whether a biospheric value orientation is emerging independently from an altruistic value orientation and whether the three value orientations provide a distinct basis for environmental beliefs, intentions, and behavior. The brief value instrument used in the current study proved to be a reliable and valid instrument that is easy to administer and, consequently, could be a useful instrument to answer these questions.

Notes

1. The definition of environmentally significant behavior (ESB) is based on the impact of behavior on the environment, which is not necessarily in line with human perceptions; for example, people may not know or acknowledge the environmental impact of their behavior. Throughout this article, we refer to *ESB* as self-reported and actual behavior.

2. Beliefs refer to evaluations of consequences of ESB. In the current study, we employ a broad definition of beliefs, including environmental concerns, problem awareness, ascription of responsibility, and attitudes.

3. Full results of the study are reported in Steg, Drijerink, and Abrahamse (2005). Here, we focus on the development and testing of the value instrument, which has not been reported in Steg et al. (2005).

4. Exploratory factor analyses via principal component analysis as well as confirmatory factor analyses via structural equation modeling (Lisrel 8; Jöreskog & Sörbom, 1993) also suggest the distinction between three factors, which implies that we replicated the current results not only in different samples but also by using different types of data analyses as well. We prefer to report the data provided by multiple group method (MGM) because it (a) is the most robust method for small sample sizes and (b) provides clear information about how the model may be improved.

5. The current study was part of the European Union–funded project ASsess Implementations in the Cities of Tomorrow (ASI; EVG3-CT-2002-80013).

6. This article is not aimed at exploring differences between countries. We elaborate on the distinction of value orientations in different countries and cultures in another article (De Groot & Steg, in press).

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