Testing and Extending Schwartz Refined Value Theory Using a Best-Worst Scaling Approach

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Abstract

The theory of human values (Schwartz, 1992) discriminated 10 basic values arrayed in a quasi-circular structure. Analyses with several instruments in numerous samples supported this structure (Schwartz, 2015). The refined theory of human values (Schwartz et al. 2012, in press) discriminates 19 values in the same circle. Its support depends on one instrument, the revised Portrait Values Questionnaire (PVQ-R). We introduce a forced choice method, the Best-Worst Value scale (BWVr), to assess the robustness of the refined theory to method of measurement and also assess the distinctiveness and validity of a new animal-welfare value. Three studies (N=784, 439, and 383) support the theory and the new value. Study 3 also demonstrates the convergent and discriminant validity of the 19 values by comparing the BWVr, the PVQ-R, and value-expressive behaviors and confirms the test-retest reliability of BWVr responses. These studies provide further information about the order of values in the value circle.

Testing and extending Schwartz refined value theory using a best-worst scaling

approach

Values are desirable life-goals that transcend situations and reflect what is important to people in their lives (Allport, Vernon, & Lindzey, 1960; Rokeach, 1968; Schwartz, 1992). Values serve as motivators and act as guiding principles in daily life; they influence perceptions, attitudes, and behavior (see recent reviews, in Bardi et al, 2008; Maio, 2010; Roccas & Sagiv, 2010). Values are ordered in a personal hierarchy of importance. That is, for one person hedonism may be more important than security, whereas for another security may be more important than hedonism. The more important a value is in the hierarchy, the more it is likely to guide a person's life.

According to the theory of basic human values (Schwartz, 1992), values form a circular motivational continuum. This continuum has been partitioned into 10 basic values and more recently 19 refined values (Schwartz, et al. 2012). However, Schwartz et al. (2012) found some inconsistencies between the 19 value theoretical ordering and their empirical results, based on data using the portrait values questionnaire. The current research seeks to validate and extend Schwartz et al.'s refined values theory using a very different instrument, based on best-worst scaling (Louviere et al, 2015).

The Schwartz value theory

Schwartz's (1992) circular structure of values captures the conflicts and compatibilities among the motivations that values express. He divided the continuum into 10 broad, distinct values for scientific convenience (see Figure 1a). Adjacent values in the Figure (e.g., conformity and tradition) express compatible motivations, such that a choice to pursue one value can simultaneously promote the attainment of the other. Values that are distant around the Figure

(e.g., security and stimulation) express conflicting motivations, such that choices to pursue one value block or interfere with attainment of the other.

Evidence supporting the circular structure of values comes from hundreds of samples in over 75 countries using different measurement instruments (Schwartz, 2015). Support for the structure was primarily found by examining spatial relations among value items produced by non-metric multidimensional scaling. As expected, items usually formed regions around a circle that represented each of the 10 basic values and located them in their theorized order, with minor deviations.

The 10 basic values in Figure 1a have been measured by at least six different instruments. These include the Schwartz Value Survey (Schwartz, 1992), the Portrait Values Questionnaire (Schwartz et al. 2001), the Picture-Based Value Survey for children (Döring, Blauensteiner, Aryus, Drögekamp, & Bilsky, 2010), the Schwartz Values Best-Worst Survey (Lee, Soutar, & Louviere, 2008), and two paired comparison methods (Bilsky et al., 2015; Oishi, Schimmack, Diener, & Suh, 1998). The bases for these instruments differ widely. Two measure values with rating scales (Schwartz Value Survey and Portrait Values Questionnaire) and three use forced choice methods, including q-sort (the Picture-Based Value Survey), best-worst scaling (Schwartz Values Best-Worst Survey), and pairwise comparisons.

Five of the six instruments ask respondents to consider how important each value is to them personally or to compare the personal importance of different values for themselves. The Portrait Values Questionnaire (Schwartz et al., 2001) asks respondents to consider how similar they are to brief descriptions of gender-matched individuals. Schwartz, et al. (2001, p 523) created the Portrait Values Questionnaire to be more concrete and less cognitively complex than previous instruments and to "differ substantially from the SVS in its format and judgment task to provide an independent test of the theory of value content and structure." The main

difference in this measure is that respondent's values are inferred from their self-reported similarity to people described in each value portrait.

[Insert Figure 1a and 1b about here]

Refined Values Theory

The most recent extension to the basic theory of human values (Schwartz et al., 2012) sought to identify a more refined set of meaningful, conceptually distinctive values around the motivational continuum (see Figure 1b). To identify refinements, these researchers examined values with multifaceted definitions and looked for unidentified value constructs between adjacent basic values. Specifically, they suggested a division of self-direction into thought and action, power into dominance and resources, security into societal and personal, conformity into rules and interpersonal, benevolence into caring and dependability, and universalism into nature, concern, and tolerance. They also identified two new values—face and humility. Table 1 presents the conceptual definitions of the 19 refined values.

[Insert Table 1 about here]

Schwartz et al. (2012) located the 19 refined values within the existing motivational continuum and argued that these values meet the criteria he previously used to classify constructs as values (Schwartz, 1992). Specifically, he identified five characteristics of values on which earlier researchers had agreed: Values (1) are beliefs linked to emotions, (2) refer to desirable goals that motivate action, (3) transcend specific actions and situations, (4) serve as standards for evaluating actions, people, and events, and (5) form a relatively enduring hierarchical system ordered by importance (e.g., Vernon & Allport, 1931; Rokeach, 1973). Later, Schwartz (2006, 2015) added to these criteria, arguing that values (6) guide attitudes and actions based on tradeoffs between the values that promote them and inhibit them, and (7) affect everyday decisions in a way that is rarely conscious.

Schwartz et al. (2012, in press) tested the refined values theory in 10 countries with a new Portrait Values Questionnaire. Confirmatory factor analysis and distinct associations with attitudes, value-expressive behaviors, and socio-demographic variables supported the discrimination of 19 values. Multidimensional scaling supported the circular motivational structure of the 19 values. Unexpectedly, the theorized order of universalism and benevolence values reversed in each of 14 samples. The authors offered speculative explanations for this reversal and Schwartz and Butenko (2014) suggested that the findings might suggest a different theoretical order for the 19 values. One explanation pointed to the possible effect of measurement method, because such a reversal had appeared almost exclusively in studies of the original 10 values when using the Portrait Values Questionnaire. Thus, assessing the refined values theory with a different instrument might help to clarify whether the reversal of universalism and benevolence values depends on method of measurement.

A new measure of refined values: Best-worst scaling

Only one instrument is currently available to measure the 19 refined values: the Portrait Values Questionnaire Refined (PVQ-R, Schwartz et al, 2012). This instrument asks respondents to rate how similar they are to gender-matched individuals who are described in terms of their important values. In total, there are 57 items (e.g., Hedonism item: "Enjoying life's pleasures is important to him") for which respondents are asked "How much is this person like you?" on a 6-point rating scale (Not like me at all, Not like me, a little like me, moderately like me, like me and very much like me)[1]. In order to provide an independent test of the theory of value content and structure, we developed a new measurement instrument that differed substantially from the PVQ-R.

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[1] Schwartz et al. (2012) also used 11-point scales in some samples.

We chose Best-Worst Scaling (BWS) to measure the refined values (Finn and Louviere, 1992; Louviere, Flynn, & Marley, 2015). BWS is an extension of the well-known "Method of Paired Comparisons" (Thurstone, 1927; David, 1988). Essentially, it is a method of multiple comparisons. The number of pairs one must compare for any set of J items is J(J-1)/2. This number increases geometrically with J, making the method much less attractive as J increases. BWS applies experimental design principles to form manageable numbers of comparison sets of fixed sizes (triples, quadruples, quintuples, etc.) rather than pairs.

Louviere, Flynn, and Marley (2015) suggest that balanced incomplete block designs (BIBDs) can be used to form comparison sets of items. This approach has the advantages of creating sets of fixed sizes in which each item occurs and co-occurs with each other item equally often. The number of comparison sets increases approximately linearly in J. This makes BWS feasible for many research applications that use rating scales or similar methods. However, two limitations with using BIBDs to construct comparison sets can be problematic. First, BIBDs do not exist for all J. Second, some BIBDs (see Table S1), such as ones for J=19 and J=20 produce large numbers of comparison sets (e.g., 57 sets of 3 objects each) or large set sizes (e.g., 19 sets of 9 objects each).

BWS tasks ask participants to choose the two extreme items in each set (best/worst, most/least, etc.). Louviere, Flynn, and Marley (2015) discuss the theory underlying BWS and the properties of the resulting scales (measures). Briefly, the theory is a multiple-choice extension of the theory underlying Paired Comparisons, known as Random Utility Theory (Thurstone, 1927). Each item has a latent (subjective) value that is not directly observed. With a sufficient number of BWS choices, it is possible to measure the mean subjective value of the item plus an associated random error. Thus, BWS yields additional discrete choice information from each comparison set.

Louviere, Flynn, and Marley (2015) discuss ways to represent and analyze BWS choices. A simple method is to use the observed choice counts to estimate the subjective values. This is consistent with using the marginal totals from contingency tables to represent statistical effects, where one side of the table is the observed choices and the other side is the J items of research interest (Louviere & Woodworth, 1983). A number of other parametric and non-parametric methods can be used to estimate the subjective values of a set of J items from BWS choices. All of these methods provide approximately the same information about the items, but some are more efficient statistically.

The more consistent participants are in choosing particular items as best or worst, the larger the differences in the resulting measures of the subjective values of the items. These measures can be treated as ipsatized differences (i.e., Best minus Worst choice counts), odds ratios (Best counts divided by Worst counts) or other measures such as square root ratios (i.e., the square root of Best counts divided by Worst counts). Perfectly consistent choosers will produce counts that are exactly the inverse of one another. For simplicity and ease of understanding, we use BWS scores based on the simple calculation of counts, subtracting the number of times each value item is chosen least important from the number of times it is chosen most important. Such BWS scores typically correlate highly with corresponding conditional logit choice model estimates (McFadden, 1974; Louviere, Flynn, & Marley, 2015) for aggregates of individuals.

As mentioned, BWS relies on well-tested and long-standing Random Utility Theory and provides a type of choice-based measurement that has several advantages over rating scale tasks:

1) BWS scores eliminate response biases (e.g., patterning bias) associated with rating scale measures. For example, ratings of desirable values generally are positive (i.e., "somewhat" to "very important"). If the ratings are not adjusted, they can produce high positive correlations even between values that are motivationally incompatible (Lee,

Soutar, Louviere, 2008). For many types of analysis, Schwartz (1992) suggested adjusting rating scale scores for values in order to account for response bias. He reasoned that, if a scale measures a comprehensive set of values, the average importance score across all values should be similar for everyone (Schwartz, 1992). The BWS method yields the same average score directly for everyone.

2) As noted, BWS requires participants to choose extreme value items in experimentally designed comparison sets. Rating scales give relative scores for individually answered items via a standardization procedure. Unlike BWS, rating scales lack an underlying theory that produces measures that can be tested and interpreted.

We followed the best-worst scaling approach to develop a new Best-Worst Values instrument, the BWVr, that differs markedly from the existing PVQ-R instrument by 1) asking directly about self-value importance rather than similarity to another and by 2) using choice frequencies to indicate item importance rather than averages of rating scales. The development of a new instrument to measure the refined values also provided an opportunity to examine whether a proposed new value fits within the circular structure.

Animal welfare as a personal value

Sneddon, Lee, Ballantyne, and Packer (2016) argued that the growing public concern for the treatment of animals should be considered a personal value rather than a more situation specific attitude. The literature cited below suggests that there is a distinct animal-welfare value, defined as empathic concern for the welfare of all animals. We argue that an animal-welfare value fulfils the seven features of values previously described. Specifically, an animal welfare value:

1) is based on beliefs that are linked to emotions (e.g., belief in the sentience of animals relates to greater emotional empathy towards animals (Paul & Podberscek, 2000));

2) is a desirable goal that motivates action (e.g., avoiding consumption of animal products (McDonald, 2000) and advocating on behalf of animals (Herzog & Golden, 2009));

3) transcends specific actions and situations (e.g., moral vegetarianism as a lifestyle (Zamir, 2004));

4) serves as a standard for evaluating actions, people and events (e.g., animal ownership as an indicator of personality (Gosling, Sandy, & Potter, 2010) and people seen to be cruel to animals being judged to be violent people (Merz-Perez, & Heide, 2003));

5) is part of an enduring hierarchical system ordered by importance (e.g., people sacrifice their own needs (e.g., time and money) to care for the welfare of animals on an ongoing basis (Lusk, 2011; Neumann, 2010));

6) guides attitudes and actions based on tradeoffs between values that promote and inhibit them (e.g., people who value animal-welfare more than nature are likely to oppose the killing of animals even when they threaten the environment, whereas those who value nature more than animal-welfare are likely to support a cull under these conditions (Sneddon, et al., 2016); and

7) affects everyday decisions in a way that is rarely conscious (e.g., food, clothing, entertainment and travel choice (Fennell, 2012; Phillips et al., 2012; Verbeke, 2009)).

We propose that the animal welfare value is a facet of the broad universalism value. Schwartz (1992, p. 12) defined the goal of universalism values as the "understanding, appreciation, tolerance, and protection for the welfare of all people and for nature." The refined value theory distinguishes three facets of universalism Schwartz et al. (2012, p, 669):

- Universalism-concern: commitment to equality, justice, and protection for all people.

- Universalism-tolerance: acceptance and understanding of those who are different from oneself.

- Universalism-nature: concern for the preservation of the natural environment.

One might argue that animal welfare values are part of the universalism-nature value that emphasizes concern for the environment and unity with nature. However, the welfare of individual animals is sometimes at odds with concern for the natural environment. Protecting the natural environment reflects a holistic perspective of a world constructed of biological collectives, systems, species, and communities (Callicott, 1980; Malamud, 2011; Sagoff, 1984; Sarkar, 2005). A holistic view of the environment is, by definition, largely indifferent to the suffering of individual animals. Conserving populations, communities, and biodiversity is the objective, but individual animals are expendable (Callicott, 1980; Soulé, 1985; Sarkar, 2005). For instance, people who place a high value on animal welfare would oppose culling animals (native or introduced) to help preserve ecological integrity, because doing so would cause suffering to animals (Callicott, 1980; Sarkar, 2005; Soulé, 1985; Varner, 1998). The distinctly different views about hunting as a means of population control illustrate the opposition between animal welfare and conservation organizations. Animal welfare groups, such as the Humane Society of the United States[2] and PETA,[3] actively protest against hunting and promote humane approaches to population control (e.g., fertility control and relocating animals). In contrast, when asked to state their position, conservation organizations, such as the Sierra Club, Wildlife Fund, and the Wilderness Society, either support or refuse to condemn hunting (Sagoff, 1984).

In order for the distinction between UN-nature and UN-animals to be worthwhile, they must relate differently to a set of attitudes and behaviors. The finer distinction should yield stronger associations. We expected universalism-animals to relate more strongly than universalism-nature to positive attitudes towards animals, pet ownership, and donations to animal-welfare organizations. We expected universalism-nature to relate more strongly than universalism-animals to pro-environmental attitudes and donation to environmental

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[2] http://www.deerfriendly.com/deer-population-control
[3] http://www.peta.org/category/main-issues/wildlife/culling/

organizations. Sagiv, Sverdlik, and Schwarz (2011) reported positive associations between universalism values and donation behavior, but we found no studies that distinguished among the types of organizations to which people donate.

The Present Research

We conducted a series of three studies to validate Schwartz et al.'s (2012) refined values with a new instrument and to situate the animal-welfare value within universalism. Study 1 assesses the theoretical structure of the refined values with data from the new instrument and tests the distinctiveness of the universalism-animals value in an adult sample in two countries (Australia and the USA). Study 2 assesses the structure with data in a diverse sample of American immigrants (USA). Study 3 examines the test-retest reliability of the new instrument and the convergent and discriminant validity of this measure with the PVQ-R instrument and value-expressive behaviour.

Study 1

Participants and procedures

Three hundred and eighty five Australian members of the Pure Profile consumer research panel (53% female, age range: 18- 69 years, median age category 40-44 years) participated in Study 1 in exchange for a small standard payment. Three hundred and ninety nine American members of the Amazon Mechanical Turk (MTurk) marketplace (51% female, age range: 18-69 years, median age group 30-34 years) also participated in the study. MTurk is a crowdsourcing web service through which anonymous participants complete tasks posted by requestors. MTurk panel members are at least as representative of the population as traditional online panels (Buhrmester, Kwang, & Gosling, 2011). We posted an invitation to complete an estimated 11-minute survey for $1.10 USD. Basic parameters required respondents to reside in the US and

to have a 96% job acceptance rate with MTurk. This indicates they had completed almost all of their past MTurk tasks successfully and were likely to be concerned with maintaining their high rating and, thus, to respond seriously.

All 784 participants completed an online survey that included the new BWVr, past donation behavior, and a range of socio-demographic variables. Approximately half of the Australian participants were also asked to report their pet ownership and attitudes towards animals and the environment ($n = 188$).

Instruments

As noted earlier, we developed a new instrument (the BWVr) to measure the Schwartz et al. (2012) refined values plus the proposed new animal welfare value (universalism-animals) as an alternative to the PVQ-R. We followed the best-worst scaling approach outlined in the best-worst scaling section. First, we designed value items (e.g., Hedonism item: "Taking advantage of every opportunity to enjoy life's pleasures") appropriate for assessing personal importance rather than comparing other to self. In comparison, the refined values PVQ-R items describe a person in terms of his or her values (e.g., Hedonism item: "Enjoying life's pleasures is important to him").

Next, we sought an experimental design that produced a manageable number of subsets for 20 values (19 refined values plus a new universalism-animals value). A desirable experimental design was found for 21 objects or, in this case, items (see Table S2 in Supplemental Materials).[4] This design produced 21 sets with five value items in each set. Across all 21 sets, each item appears five times and each pair of items appears together once.

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[4] In order to fill out the 21 items design, we developed two items for the stimulation value (ST-novelty, "variety, novelty and change" and ST-excitement, "excitement, stimulation and change"). The scores for these two items were averaged to determine the final score for the Stimulation value. Stimulation was chosen as it neither neighbours nor opposes the animal-welfare value and, as such, was expected to be largely unrelated.

Figure 2 illustrates one set of five items, including the items for self-direction-action, achievement, security-personal, conformity-interpersonal, and universalism-tolerance. Each respondent received 21 randomly ordered sets. The full BWSr instrument is available in the supplemental materials.

[Figure 2 about here]

Participants were asked to choose *both* the most and the least important value in each of 21 sets of five values. We calculated respondents' scores for each value by subtracting the number of times they chose a value as least important from the number of times they chose the same value as most important. We divided these scores by five, the number of times each value appeared across all of the BWS sets, so resulting scores ranged from -1 to +1 (see Louviere, et al., 2013). Zero is the mid-point of the latent scale, with scores above zero indicating greater importance and scores below zero indicating less importance.

To capture past donation behaviors, we used the Bekkers and Wiepking (2006) method. Respondents reported whether they had donated in each of 12 ways in the past year (e.g., door-to-door solicitation at home, collection in a place of worship). They then reported whether they had donated in the past year to each of 14 charitable or non-profit sectors (e.g., animal-welfare, environmental, religious, and spiritual organizations) and if they were current pet owners. All responses were on a yes/no scale.

To measure environmental attitudes, we used Dunlap, Van Liere, Mertig, and Jones' (2000) 15-item New Ecological Paradigm (NEP) scale. To measure attitudes to animals, we used Herzog, Betchart, and Pittman's (1991) 20-item scale. Responses were obtained on 5-point scales (1 = *strongly disagree* and 5 = *strongly agree*). Cronbach's alpha was .77 for the NEP and .87 for the animal-welfare scale.

Analytic Approach

We used confirmatory, theory-based ordinal multidimensional scaling (MDS) to assess the position (location and order) of the values around the circle (PROXSCAL in SPSS22). MDS represents relations between variables, in this case correlations between values items, as distances in two-dimensional space. The more highly correlated any pair of value items and the more similar their correlations with all other items, the closer they are in the space. Confirmatory, theory-based MDS compares the array of variables in space with the array expected based on theory (Borg & Groenen, 2005). This makes it appropriate for assessing the extent to which the correlations among the values produce a spatial array that corresponds to the circular array suggested by the Schwartz (1992) value theory.

Advantages of MDS over other methods are that it does not require interval-scaled data, it is robust to missing and coarse data, and it allows the data to speak for themselves rather than extracting factors or manipulating the data in other ways (Groenen & Borg, 2013). The refined value theory specifies a circular motivational structure of the value space, within which value facets are partitioned into regions. The theory specifies the values' circular order, but it does not specify the distances between the values around the circle or their distances from the center of the circle. Hence, the questions we ask are whether the points that represent the refined values (including universalism-animal) form a circular array and whether they follow the theoretically specified order. MDS also enabled us to see whether the universalism-animals value can be seen as a separate facet located in the broad spatial region formed by the other universalism value facets.

Following Bilsky, Janik, and Schwartz (2011), we used ordinal proximity transformations, Euclidian distance measures, z-score transformations of values, and a custom, theory-based initial configuration of the 21 points around a circle to estimate the two-dimensional structure. A Torgerson initial configuration yielded very similar results. The custom initial configuration

specifies a priori which item should be located into each region of the circle. We tested whether the MDS representation mirrored the theoretical order of values, such that the items emerged in the expected order in the MDS space.[5]

Results

Columns 1-4 of Table 2 show the means and standard deviations of the value scores obtained in Study 1. In both the Australian and USA samples, benevolence-dependability and benevolence-caring were the most important values and PO-dominance was the least important value. All 20 value scores showed reasonable variation, as indicated by their standard deviations.

[Insert Table 2 about here]

Figure 3a displays the two-dimensional space, partitioned into the 20 refined values. The space represents the associations among the items well (Kruskal's stress 1 measure was .12 and the dispersion accounted for was .99). The location of the refined values around the circle in Figure 3a corresponds to the theoretical order (see Figure 1b) with one small deviation, benevolence-caring and benevolence-dependability are reversed. Moreover, the universalism and benevolence values conform to the originally theorized order rather than reversing as they did in Schwartz et al. (2012). The observed order permits combining adjacent values to reconstitute the ten basic values of the original theory. This adds support to the assumption that the refined values form the same motivational circle as the original ten values and makes it possible to compute scores for the ten basic values.

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[5] While other methods have been suggested to test circular structures, they are less appropriate for the present research. Confirmatory factor analysis can be used to test regions, but not the order around the circle. Programs like CIRCUM and CircE are either too restrictive (requiring equal distances between objects and/or equal distance from the center, which are not components of values theory) or inappropriate for use with relative data, such as that produced by BWS tasks.

[Insert Figure 3 about here]

Distinctiveness of universalism-animals. The correlations of universalism-animals with other universalism facets in both samples support its distinctiveness. It correlated only moderately with universalism-nature (AU $r = .33$, $p < .001$; US $r = .42$, $p < .001$), weakly with universalism-concern (AU $r = .13$, $p = .01$; US $r = .15$, $p = .002$), and even more weakly with universalism-tolerance (AU $r = .08$, $p = .10$; US $r = .09$, $p = .06$). The correlations of universalism-animals with the other universalism facets were no higher than correlations among some other values. Inter-correlations among all 20 values ranged from $r = -.37$ (achievement & conformity-interpersonal) to $r = .49$ (power-resources & power-dominance), with a mean correlation of -.05.

Confirming expectations, Australian pet owners assigned more importance to universalism-animals than did those without pets ($M = .08$ vs. $M = -.15$, $t_{(157)} = 3.55$, $p < .001$), but they did not differ in the importance they assigned to universalism-nature (owners $M = .04$ vs. non-owners $M = -.06$, $t_{(157)} = 1.70$, $p = .09$). Also confirming expectations, Australians' attitudes toward animals correlated more positively with universalism-animals ($r = .43$, $p < .001$) than with universalism-nature ($r = .26$, $p < .001$, $z_{(185; \text{one-tailed})} = 2.19$, $p = .01$), whereas their environmental attitudes (NEP scale) correlated more positively with universalism-nature ($r = .45$, $p < .001$) than with universalism-animals ($r = .26$, $p < .001$, $z_{(185)} = 2.46$, $p = .01$). Further, universalism-animals correlated more positively than universalism-nature with donating to animal welfare organizations in both samples (Australian $r = .32$, $p < .001$ vs .13, $p = .01$, $z_{(382; \text{1-tailed})} = 3.33$, $p < .001$; American $r = .34$, $p < .001$ vs .13, $p = .01$, $z_{(396)} = 4.04$, $p < .001$), as expected. Conversely, universalism-nature correlated more positively than universalism-animals with donating to environmental organizations in both samples

(Australian $r = .29$, $p < .001$ vs .11 $p = .04$, $z_{(382)} = 3.13$, $p < .001$; American $r = .29$, $p < .001$

vs .09 $p = .09$, $z_{(396)} = 3.80$, $p < .001$).

Discussion

Study 1 offers strong support for the refined, circular, theoretical structure. It also supports the

use of the BWVr instrument to investigate the refined values theory. Moreover, the study

provided initial evidence for the proposed universalism-animals value. This value (a) was

empirically distinct from all the other values and (b) related more positively to pet ownership,

attitudes towards animals, and donating to animal welfare causes than the universalism-nature

value.

Study 2

The aim of this study was to replicate the findings of Study 1 with participants from a different

population (a diverse sample of American immigrants). Again, we tested the theoretical

structure of the refined values and the distinctiveness of the new universalism-animals value.

We revised the instrument to include only one stimulation item. In order to maintain the 21

items needed for the balanced experimental design, we included an unrelated item. This

enabled us to remove one item where necessary in subsequent analyses due to the ipsatized

nature of the scale.

Participants and procedures

Four hundred and thirty nine American (US) members of the Amazon Mechanical Turk

(MTurk) marketplace (49% female, age range: 18-69 years, median age 26, *SD* 11) participated

in Study 2. Participants were screened to be either first-generation ($n = 136$) or second-

generation immigrants to the US ($n = 303$) from a wide range of countries. Most were from

countries whose primary language was not English (117 first generation, 272 second generation). The MTurk task was posted with the same selection criteria as in Study 1, with a payment of $1.80 for an estimated 18 minute task.

Instruments

As in Study 1, we used the BWVr instrument to measure values. We modified the instrument in two ways. We measured stimulation with the single item "Having all sorts of new and exciting experiences" and we include the unrelated item "Explaining my ideas clearly to others" to produce the same number of comparison sets (21 sets) as in Study 1. As in Study 1, we included pet ownership, and a subsample of respondents ($n = 118$) also completed the NEP scale (Dunlap, Van Liere, Mertig, & Jones, 2000).

Results

The fifth and sixth columns in Table 2 present the means and standard deviations of the value priority scores for Study 2. As in Study 1, benevolence-dependability and benevolence-caring were the most important values and power-dominance was the least important. All 20 value scores had reasonable variation, as indicated by their standard deviations (.33 to .50).

A two dimensional MDS solution again represented the associations among the value items well. It accounted for 98% of the dispersion and had a Kruskal's Stress 1 index of .13. Figure 3b displays the solution, partitioned into the 20 value regions. The order of the refined values around the circle corresponds to the theoretical order in Figure 1b, with three small deviations. As in Study 1, benevolence-caring and benevolence-dependability were reversed. In addition, the tradition value reversed with both conformity values. Also as in Study 1, the universalism and benevolence values conformed to the original theorized order rather than reversing as, they did in Schwartz et al. (2012).

Distinctiveness of universalism-animals. The correlations of universalism-animals with the other universalism facets again supported its distinctiveness. The correlations were only moderately positive with universalism-nature ($r = .44$, $p < .001$) and universalism-concern ($r = .31$, $p < .001$), and very weak with universalism-tolerance ($r = .07$, $p = .18$). Furthermore, the correlations of universalism-animals with the other universalism facets were no higher than correlations among some of the other values. Inter-correlations among all 20 values ranged from $r = -.37$ (self-direction-action & benevolence-dependability) to $r = .57$ (stimulation & hedonism), with a mean correlation of -.05.

As expected, American immigrant pet owners assigned more importance than those without pets to universalism-animals ($M = .07$ vs. $M = -.26$, $t_{(437)} = 7.87$, $p < .001$), but they did not differ in the importance they attributed to universalism-nature (owners $M = -.01$ vs. non-owners $M = -.08$, $t_{(157)} = 1.75$, $p = .08$). Also, as expected, American immigrants' attitudes toward the environment (NEP scale) correlated more positively with universalism-nature ($r = .57$, $< .001$) than with universalism-animals ($r = .43$, $p < .001$, $z_{(185)} = 1.73$, $p = .04$).

Discussion

The results of Study 2 strengthen support for the theorized motivational circle of the refined value theory and for universalism-animals as a distinct value in the circle. This study further supports the use of the BWVr instrument to operationalize the refined values theory. Removal of the additional non-value item had little influence on the MDS structure.

Study 3

This study assessed the test-retest reliability of the values measured with the BWVr over eight weeks and compared the measurement of values using the best-worst scaling instrument with the measurement of refined values by the PVQ-RR and value-expressive behaviors. The PVQ-

RR is the currently recommended revised instrument for operationalizing the refined values theory (Schwartz, in press). We assessed the convergent and discriminant validity of the values through a multitrait-multimethod approach (Campbell & Fiske, 1959), as well as the correlated traits-correlated methods (CTCM) confirmatory factor analysis approach (Jöreskog, 1974; Widaman, 1985).

Participants and procedures

At time 1 (T1), 402 US members of the MTurk online marketplace participated in the study. We excluded 19 participants who failed two or more of the attention checks included in the questionnaire. For example, they failed to follow the instruction in the item "It is important to show you are reading the items by selecting 'not like me at all' on the far left." The final T1 sample included 383 respondents ranging from 19 to 72 years old (M_{age} = 35.61 years; SD = 11.56; 44% female). We posted the MTurk task with the same selection criteria as in Study 1, with a payment of $2.30 for an estimated 23 minute task.

Eight weeks later (T2), participants from T1 were invited through a custom-built MTurk messaging application to complete a follow-up task. The response rate at T2 was 72%. We dropped four participants who reported inconsistent genders or birth years between T1 and T2 from further analyses. This resulted in a final sample of 277 participants at T2 that ranged from 19 to 71 years old (M_{age} = 36.95 years; SD = 11.80; 47% female). The MTurk task was posted with a payment of $1.20 for an estimated 13-minute task.

The survey at T1 included the PVQ-RR and the BWVr presented in counterbalanced order, followed by several socio-demographic variables. The online survey at T2 included the BWVr followed by a questionnaire that measured everyday behaviors.

Instruments

We measured values in Study 3 with two instruments, the BWVr and the PVQ-RR. The PVQ-RR includes 57 gender-matched items that present one-sentence portraits of different people. The portraits describe each person in terms of a goal that is important to him or her. We added three extra items to represent the new universalism-animal welfare value: "It is important to her to care for animal welfare," "It is important to her to take part in activities to defend animal rights," and "It is important to her to protect animals from harm." Respondents indicated how similar the person in each portrait is to them on a 6-point labeled scale ranging from not like me at all (1) to very much like me (6). Respondents required a similar amount of time to answer each of the instruments (BWVr median = 4 minutes and 57 seconds; PVQ-RR median = 4 minutes and 16 seconds).

We adopted a questionnaire from Schwartz and Butenko (2014) to measure the frequency of everyday behaviors expressive of the 19 refined values. This questionnaire includes 85 behaviors (3 to 6 for each of the 19 refined values). We supplemented it with a set of six everyday behaviors generated to reflect the new universalism-animals value (e.g., "Donate money or time to an animal welfare-focused charity." "Mention a report or article about animal welfare to someone else." "Avoid buying items that are tested on animals."). Respondents reported how often they had engaged in each behavior during the past 12 months relative to their opportunity to do so on a 5-point scale [0 = never, 1 = rarely (about a quarter of the times), 2 = sometimes (about half of the times), 3 = usually (more than half the times), and 4 = always], with an additional option for never having an opportunity (coded as missing).

Results

Test-retest correlations. Over the 8-week period, the BWVr showed reasonable test-retest correlations, ranging from .80 for universalism-nature to .47 for Face. Across all values, the

average test-retest correlation was .65. This is similar to test-retest correlations reported in other studies using three different instruments. For example, using the Schwartz Value Survey, Bardi, Lee, Hofmann-Towfigh, and Soutar (2009) reported an average test-retest correlation for the original 10 values of .64 over 3 months and .58 over 1 year for adults.

A two dimensional MDS solution represented the associations among the BWVr items well. It accounted for 98% of the dispersion and had a Kruskal's Stress 1 index of .13. The order of values around the circle was very similar to Study 2: Benevolence-caring and benevolence-dependability reversed, as did tradition and the conformity values. In addition, achievement and power values also reversed in this study. A separate two-dimensional MDS solution of the values measured with the PVQ-RR also represented the associations among values well (stress 1 = .17, dispersion accounted for = .98). The order of values around the circle deviated from the theorized order only in a reversal of security-personal and security-societal. The universalism and benevolence values conformed to the original theorized order in both the BWVr and the PVQ-RR analyses.

Distinctiveness of UN-animals. The correlations of universalism-animals with the other universalism facets again supported its distinctiveness. For the BWVr, universalism-animals correlated only moderately positively with universalism-nature ($r = .55$, $p < .001$) and UN-concern ($r = .39$, $p < .001$), and more weakly with universalism-tolerance ($r = .23$, $p < .001$). For the PVQ-RR, universalism-animals also correlated moderately positively with universalism-nature ($r = .61$, $p < .001$) and far more weakly with universalism-concern ($r = .12$, $p = .02$), and universalism-tolerance ($r = -.00$, $p = .94$).

Convergent and discriminant validity. Table S3 (in supplemental materials) presents the multitrait-multimethod matrix of the correlations among the 20 values measured by the BWVr and the PVQ-RR. For this analysis, we partialled each individual's responses to the PVQ-RR

items on his or her mean rating of the 60 items to control for individual differences in scale use, as is usual practice (see Schwartz, 1992, 2006). Using Campbell and Fiske's (1959) approach, we found support for the convergent validity of the 20 values: The 20 single trait–multimethod correlations ranged from .38 to .77 (see Table S4), and all differed significantly from zero ($p < .001$). The following evidence also supported discriminant validity of the values:

1. Each of the single trait-multimethod correlations on the diagonal was higher than the correlations of that value with other values, regardless of method.

2. Each value measured with one method correlated more highly with the same value measured with the other method than with the other values measured with its own method.

3. The pattern of interrelationships among values was similar for each method.

We also applied the correlated traits-correlated methods (CTCM) confirmatory factor analysis approach (Jöreskog, 1974; Widaman, 1985) to examine this issue further. In this analysis, we used the data on everyday behaviors (see Table 3), which enabled a comparison across three approaches. For confirmatory factor analyses, it is appropriate to use the raw PVQ-RR scores in order to avoid problems with ipsatized scores (see Fischer, 2004; Schwartz, 2016).

It is problematic to examine the CTCM model across the 20 values simultaneously. We therefore estimated four models, using subsets of the values around the circular motivational continuum shown in Figure 1b. The subsets were 1) benevolence and universalism values, 2) self-direction, stimulation, and hedonism values, 3) achievement and power values, and 4) face, security, tradition, conformity, and humility values. Table 4 presents the results. Although the chi-square statistics were significant, the other fit indexes suggested a reasonable fit in each

case.[6] Thus, the CTCM model provides a good basis for examining the three methods. The trait variance accounted for 60% of the variability in the data. This indicates that the traits were somewhat more important than the methods used, but the methods did have an impact. Of particular interest are the correlations between the methods (i.e. the PVQ-RR, the BWVr and the behavior scales), which varied from .33 to .77. This suggests that the best-worst scaling approach of the BWVr taps the same underlying dimensions as the other two methods.

[Insert Table 3 and 4 about here]

Discussion

Study 3 strengthens the support for using the BWVr instrument to operationalize the refined values theory. The comparison of value measurement by the BWVr with the PVQ-RR and value-expressive behaviors confirmed the convergent and discriminant validity of the refined values as measured by the BWVr. Moreover, the results further supported the theorized motivational circle of the refined values theory.

General Discussion

The current research provides the first support for the 19 values in the refined values theory (Schwartz et al. 2012, Schwartz, in press) using a measurement approach other than the PVQ-R or PVQ-RR. The BWVr uses choice frequency rather than averages of rating scales, and direct self-description rather than judgment of similarity to self. Results of the multi-method multi-trait analysis, based on the BWVr and the PVQ-RR confirmed the convergent and discriminant reliability of each of the refined values based on the BWVr.

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[6] It was necessary to fix a small number of negative error variances to a small positive value before the final models were estimated. In CTCM small negative error variances are commonly found. These may occur through sampling error alone. When this is the case, the offending parameter may be fixed to a proper value (Rindskopf, 1984).

The studies also supported the distinctiveness of a new universalism-animal value whose motivational basis differed from the other universalism facets and from all the other 16 values. Within the broad universalism value, two subsets of facets differed most, the two human focused values (universalism-concern and universalism-tolerance) versus the two non-human focused values (universalism-animals and universalism-nature). However, there was clear evidence that the motivations underlying the universalism-nature and universalism-animals values differed. Although these two values share a common broad concern, they can conflict when protecting animals is at odds with protecting nature (e.g., culling animals in order to protect the natural environment in national parks). The significantly different associations of these two values with relevant attitudes and behaviors in Studies 1 and 2 attest to their distinctiveness.

The findings are compatible with the idea that many people perceive non-human animals as sentient beings with human-like feelings and cognitions. The universalism-animals value expresses a motivation to enhance or protect the welfare of non-human animals with which people empathize. In contrast, universalism-nature expresses a motivation to enhance and protect the natural environment for the welfare of present and future generations. Although universalism-animals refers to "all animals," the empathic concern that uniquely underlies this value may be greater for animals that are more like us (e.g., mammals) and less for other species, especially species considered dangerous to humans (e.g., venomous snakes and sharks). The animal species that elicit empathy from people and to which this value applies may also differ across cultures. These are topics for future studies. Further research should also examine whether people who prioritise universalism-nature have more concern for animals at the species level as an integral part of an ecosystem than those who prioritise universalism-animals.

The universalism-animals value promises greater precision and predictive power for understanding animal-welfare attitudes and behavior, a growing societal concern (Eurobarometer, 2007; Herzog & Golden, 2009; Phillips, 2008; Regan, 1987; Rollin, 2010; Singer, 1990; Varner, 1998; Verbeke, 2009). The importance of issues related to animal welfare in society and the improvement in predictive ability from the inclusion of a universalism-animals value should offset the respondent costs of adding this item.

In the MDS analyses in all three studies, there were a few deviations from the theorized order of values around the circle. In each case, the reversal of order occurred between values that are adjacent in the circle or at most separated by one other value according to the theory. Moreover, in no case did a value from one higher order value emerge in the spatial region of a different higher order value. Schwartz & Sagiv (1995) found a similar degree of variation when they ran MDS analyses on subsamples obtained by splitting larger samples. When we ran MDS analyses on randomly chosen subsamples of the data in the three studies, only one deviation replicated across all subsamples, the reversal of benevolence-dependability and benevolence-care which led to the location of benevolence care adjacent to universalism-concern. This may reflect the motivational affinity between these two values. Both emphasize helping others in need, whether close others (benevolence) or those outside one's in-group (universalism).

In contrast to the Schwartz et al. (2012) findings in 10 countries with the PVQ-R), the order of the universalism and benevolence values in all the samples studied here corresponded to the theorized order. This casts doubt on the Schwartz et al. (2012) explanations for the reversal of these values that they observed. They suggested methodological aspects of the PVQ-R measurement instrument in contrast to earlier instruments, or changes in the meaning of the values due to recent historical developments or to splitting the two values into five narrower values. We based our questioning of the methodological explanation only on the MDS results of the single sample from Study 3. We therefore also examined newly available

MDS analyses of unpublished PVQ-RR data from 42 samples in 21 countries.[7] Benevolence and universalism exhibited the same theorized order found in our studies in 25% of these samples but reversed in 38% of the samples. In another 39% of samples, one or both of the benevolence value facets were located toward the center of the value space. Apparently, there is no stable ordering of these two values. This leaves the explanation of the order of benevolence and universalism in the refined value theory as a challenge for future investigation.

Our results add to growing evidence that one can legitimately partition the circular motivational continuum into broader or narrower sets (Schwartz et al., 2012). The multidimensional scaling results permitted partitioning into the 19 refined values, the ten original values, and the four original higher order values. The optimal partitioning depends upon one's research objectives.

These three studies used data from online, panel surveys in the USA and Australia. Although panels can provide quality data, it would be valuable to measure the refined values with the BWVr in face-to-face surveys. It is also important to test this instrument in samples from different countries and in different languages.

Together, these studies provide strong support for Schwartz et al.'s (2012) refinement of the theory of basic human values. Applying the newly developed best-worst scale, a substantially different method of measurement than previously used to assess the theory, we replicated its theorized circular, motivational structure of values. The studies also validated the new BWVr as a useful way to measure the 19 values. In addition, the studies suggest that it is possible to distinguish a twentieth value (universalism-animals) that has low to moderate correlations with the other universalism values. Its relationships with attitudes and behavior

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[7] Data available from the fourth author.

that are relevant to animal-welfare and to the environment distinguish it from universalism-nature.

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Table 1

The 19 values in the refined theory, each defined in terms of its motivational goal

Value	Conceptual definition in terms of motivational goals
Self-direction-thought	Freedom to cultivate one's own ideas and abilities
Self-direction-action	Freedom to determine one's own actions
Stimulation	Excitement, novelty, and change
Hedonism	Pleasure and sensuous gratification
Achievement	Success according to social standards
Power-dominance	Power through exercising control over people
Power-resources	Power through control of material and social resources
Face	Maintaining one's public image and avoiding humiliation
Security-personal	Safety in one's immediate environment
Security-societal	Safety and stability in the wider society
Tradition	Maintaining and preserving cultural, family, or religious traditions
Conformity-rules	Compliance with rules, laws, and formal obligations
Conformity-interpersonal	Avoidance of upsetting or harming other people

Humility	Recognizing one's insignificance in the larger scheme of things
Benevolence-dependability	Being a reliable and trustworthy member of the in-group
Benevolence-caring	Devotion to the welfare of in-group members
Universalism-concern	Commitment to equality, justice, and protection for all people
Universalism-nature	Preservation of the natural environment
Universalism-tolerance	Acceptance and understanding of those who are different from oneself

Note. Adapted from "Refining the theory of basic individual values," by Schwartz et al., 2012, *Journal of Personality and Social Psychology, 103,* p. 669. Copyright 2012 by the American Psychological Association.

Table 2

Means and Standard Deviations of the refined values: Study 1 (Australia and USA), Study 2 (USA - immigrants) and Study 3 (USA)

Refined values	Australia (*n*= 385) M	SD	USA (*n* = 399) M	SD	Study 2 (N = 439) M	SD	Study 3 (N = 277) 8 week test-retest *r*
Self-Direction: Thought	.06	.36	.25	.38	.18	.39	.58
Self-Direction: Action	.21	.34	.36	.36	.32	.39	.62
Stimulation: Novelty	-.03	.35	.07	.38	.07	.43	.73
Stimulation: Excitement	-.08	.38	-.05	.42			
Hedonism	.08	.37	.16	.43	.18	.45	.66
Achievement	-.28	.44	-.01	.42	.07	.50	.73
Power: Dominance	-.55	.35	-.54	.36	-.48	.36	.63
Power: Resources	-.44	.44	-.39	.46	-.33	.48	.66
Face	-.34	.36	-.37	.34	-.29	.37	.47
Security: Personal	.28	.31	.23	.33	.24	.34	.59
Security: Societal	.39	.32	.21	.32	.23	.33	.59
Tradition	-.25	.44	-.32	.46	-.30	.47	.73
Conformity: Rules	.00	.38	-.23	.36	-.25	.39	.68
Conformity: Interpersonal	-.20	.38	-.41	.38	-.36	.42	.53
Humility	-.14	.34	-.17	.33	-.15	.35	.60
Benevolence: Dependability	.50	.36	.42	.39	.42	.37	.58
Benevolence: Caring	.47	.34	.44	.35	.41	.35	.61
Universalism: Concern	.16	.38	.20	.40	.18	.40	.68
Universalism: Nature	.01	.37	-.02	.39	-.04	.43	.80
Universalism: Animals	-.01	.41	.00	.40	-.09	.46	.61
Universalism: Tolerance	.16	.38	.16	.42	.14	.40	.84

Note: Study 1 (N = 784).

Table 3

Confirmatory factor analysis results and scale characteristics for behavioral scales - Study 3

Value-expressive behavior	Scale Mean	Scale SD	Chi-Square	# items	Sig.
Self-direction-thought	3.32	0.73	3.06	5	0.69
Self-direction-action	3.05	0.60	3.03	5	0.69
Stimulation	2.47	0.73	2.58	3	0.11
Hedonism	2.58	0.64	0.05	3	0.82
Achievement	3.28	0.75	0.20	3	0.66
Power-dominance	2.01	0.73	0.21	3	0.66
Power-resources	1.76	0.73	1.52	3	0.22
Face	2.50	0.80	2.34	4	0.31
Security-personal	3.49	0.78	5.72	5	0.34
Security-societal	1.97	0.86	0.01	3	0.95
Tradition	2.15	1.05	0.56	3	0.46
Conformity-rules	4.05	0.77	1.56	3	0.21
Conformity-interpersonal	3.23	0.71	2.31	4	0.32
Humility	3.28	0.75	2.01	4	0.37
Benevolence-caring	3.74	0.74	5.25	4	0.07
Benevolence-dependability	4.03	0.61	4.22	4	0.12
Universalism-concern	2.68	0.90	2.24	4	0.33
Universalism-nature	2.54	0.94	0.14	3	0.71
Universalism-animals	2.27	1.02	0.49	4	0.78
Universalism-tolerance	3.23	0.84	0.69	4	0.71

Note. N = 383. When there were only three items, two of the error variances were set to be equal to obtain the degrees of freedom needed to examine the significance of the CFA.

Table 4

Correlated traits-correlated methods analysis results for Study 3

	Chi-Square	Sig.	GFI	CFI	RMSEA	BW-PVQ correlation	BW-Behaviors Correlation	PVQ-Behaviors Correlation
Benevolence to Universalism	342.93	<0.01	0.91	0.94	0.08	0.43	0.35	0.49
Self-direction to Hedonism	116.22	<0.01	0.95	0.95	0.08	0.33	0.44	0.59
Achievement to Power	23.88	0.03	0.99	0.99	0.05	0.77	0.51	0.46
Face to Humility	494.25	<0.01	0.88	0.86	0.08	0.69	0.71	0.59

Note. N = 383. CFI = comparative fit index. GFI = goodness of fit index.
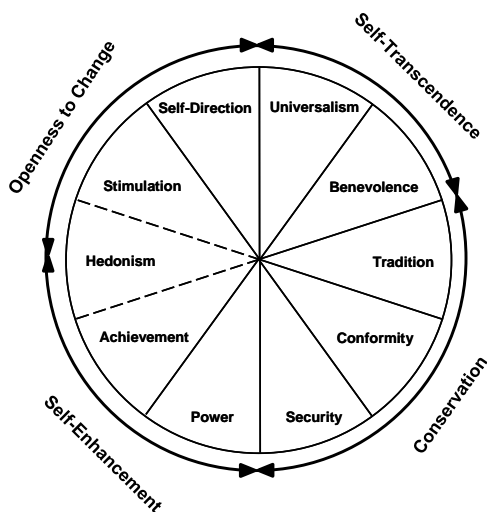
Figure 1a. The original circular motivational continuum of ten basic human values and the four higher order values from Schwartz et al. (2012)

Figure 1b. The circular motivational continuum for the refined values, four higher order values and underlying dynamic sources.

Both figures are adapted from "Refining the theory of basic individual values," by Schwartz et al., 2012, *Journal of Personality and Social Psychology, 103*. Copyright 2012 by the American Psychological Association.

1) Of these, which are the **most** and **least** important to you, as guiding principles in your life?

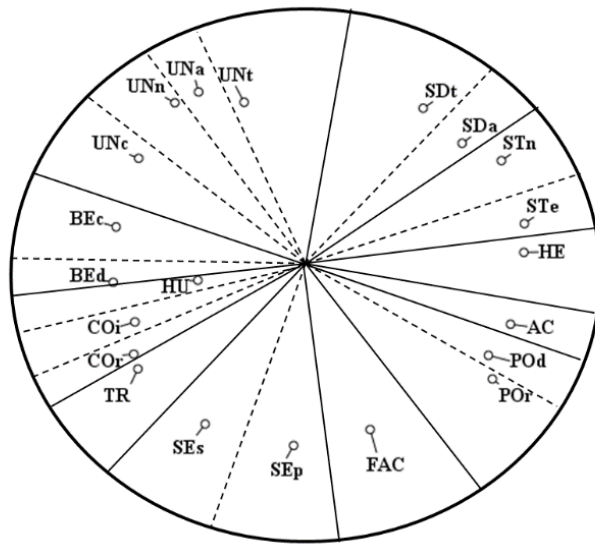| Most Important		Least Important
☐	Caring and seeking justice for everyone, especially the weak and vulnerable in society	☐
☐	Being free to act independently	☐
☐	Being ambitious and successful	☐
☐	Making sure you never upset or annoy others	☐
☐	Living and acting in ways that ensure that you are personally safe and secure	☐

Figure 2. BWVr question example set 1 of 21.

Figure 3a. Multidimensional scaling analysis of the refined values based on the pooled within-sample covariance matrix for Study 1 (N = 784). Stress 1 = .12, dispersion accounted for = .99, Tucker's coefficient of congruence = .99.
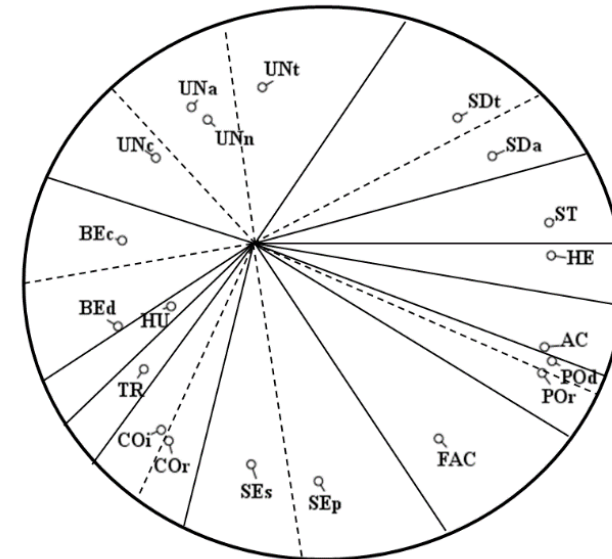
Figure 3b. Multidimensional scaling analysis of the refined values based on the sample correlation matrix for Study 2 (*N*=439). Stress 1 = .13, dispersion accounted for = .98, Tucker's coefficient of congruence = .99.

Note. Abbreviations are as follows: SDt, Self-direction-thought; SDa, Self-direction-actions; STn, Stimulation-novelty; STe, Stimulation-excitement; HE, Hedonism; AC, Achievement; POd, Power-dominance; POr, Power-resources; FAC, Face; SEp, Security-personal; SEs, Security-social; TR, Tradition; COr, Conformity-rules; COi, Conformity-interpersonal; HU, Humility; BEd, Benevolence-dependability; BEc, Benevolence-caring; UNc, Universalism-concern; UNn, Universalism-nature; UnA, Universalism-animals; UNt, Universalism-tolerance.