Journal of Sustainable Marketing

ISSN: 2766-0117 | Open Access
Vol. 3, No. 2 | https://doi.org/10.51300/jsm-2022-60

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Research Article

An Exploration of the Role of Refined Value Importance in Consumers' Sustainable Disposal Behaviors

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ABSTRACT

Research shows that consumers' personal values influence their pro-environmental behaviors. However, studies of values and pro-environmental behavior have not examined how refined values relate to a range of sustainable disposal behaviors. In the current study, we examine associations between consumers' refined value priorities and their behavior in four sustainable product disposal domains (recycling, donating, composting, and membership of giving/sharing groups) in a large and diverse sample of Australian adults. We show clear evidence of systematic relations between refined values and behaviors in each of these domains. While we show that motivationally aligned refined self-transcendence values are positively and self-enhancement values negatively associated with recycling, donating, and composting, we find the reverse relations for membership of giving/sharing groups. Our findings suggest that the study of consumers' refined values across a range of behaviors can offer a more nuanced understanding of what motivates them to engage in sustainable product disposal behaviors, with the potential to inform the development of more targeted policies and initiatives encouraging consumer participation.

KEYWORDS

Personal values, product disposal behavior, recycling, composting, donating, sustainable consumer behavior

ARTICLE HISTORY

Received: 2 September 2022
Accepted: 29 November 2022

1. Introduction

Globally, over 2 billion tons of municipal waste are generated each year, with predictions that this will increase to 3.4 billion tons by 2050 (Kaza et al., 2018). Only a small proportion of this waste is reclaimed, with approximately two thirds (65.7%) going to either landfill or open waste dumps (Kaza et al., 2018). In Australia, households generate over 12 million tons of waste each year; contributing almost half (47%) of all plastic waste and 42% of organic waste (Australian Bureau of Statistics, 2020). Despite policies and initiatives aimed at encouraging consumers to reduce, recycle, and compost their waste (see Department of Climate Change, Energy, the Environment and Water, 2019), the vast majority (approximately 84%) of Australian household waste continues to go to landfill (Australian Bureau of Statistics, 2020). To increase the effectiveness of such initiatives, policymakers and practitioners need to consider the role that consumers' personal values play in their sustainable disposal behavior.

Values, as motivational goals, have been found to be key drivers of a range of sustainable consumer behaviors (Chang, 2021; Jacobs et al., 2018). However, less is known about how values influence sustainable disposal behavior. Rather, studies of sustainable disposal behavior have largely focused on other personal and contex-

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tual factors (Cruz-Cárdenas & Arévalo-Chávez, 2018) such as environmental concerns (Schultz & Oskamp, 1996), social norms (Ewing, 2001), preferred disposal methods (Fortuna & Diyamandoglu, 2017), and product attributes (e.g., Trudel et al., 2016). There are a few exceptions, such as Mccarty and Shrum's (2001) study of consumers' values and recycling behaviors. But these studies focus on a small number of relatively broad values and individual disposal behaviors, with a particular emphasis on recycling (Onel & Mukherjee, 2017; Pikturniene & Bäumle, 2016).

The focus on recycling in the waste disposal literature is surprising given mounting evidence for the need for other sustainable disposal behaviors, such as reusing and donating products, which are increasingly important in the circular management of the product lifecycle (Atasu et al., 2021; Sarigöllü et al., 2020). In particular, we are unaware of any studies that have explored a range of sustainable disposal behaviors, and how consumers' values may motivate and inhibit such behaviors. Against this backdrop, our study examined associations between a more refined set of consumer value priorities and sustainable disposal behavior across four different domains: recycling, donating unwanted possessions, composting waste, and membership of giving/sharing groups.

The current research responds to calls for more studies on sustainable consumer behaviors (Concari et al., 2020; Lee & Kotler, 2011; Trudel, 2019). We achieve this goal by shedding light on relations between refined personal values (Schwartz et al., 2012) and different types of sustainable disposal behaviors. In so doing, we extend our knowledge beyond how values motivate or inhibit recycling behaviors (Mccarty & Shrum, 2001; Onel & Mukherjee, 2017; Pikturniene & Bäumle, 2016), to associations with a more diverse set of product disposal domains. In more practical terms, we take a first step towards providing a more nuanced picture of what consumers with different value priorities might be receptive to in terms of value-expressive promotional messages and policies aimed at engaging consumers in sustainable disposal behaviors. Indeed, our findings suggest that it is essential to develop campaigns that align with the value priorities of those consumers who are not currently engaging in sustainable disposal behaviors so as to encourage broader adoption of recycling, donating, composting, and membership of giving/sharing groups.

2. Values and Sustainable Consumer Behavior

2.1. ***Personal Values***

Personal values (e.g., benevolence, security, hedonism) are broad motivational goals that reflect what is important to people in their lives (Rokeach, 1973; Schwartz, 1992), and guide their beliefs, attitudes, and behaviors (Schwartz, 2007) across situations . While all values are at least somewhat important for most people, individuals differ in the relative importance they place on specific values. For example, caring for the welfare of others may be more important than achievement for one person, whereas for another person achievement may be more important than caring for others.

In the current study, we focus on the Schwartz (1992) theory of human values and more recent refinements to this theory (Schwartz et al., 2012; Lee et al., 2019). In his original theory, Schwartz (1992) identified a circular structure of values based on an underlying motivational continuum. He partitioned this structure into ten basic values (see Figure 1). In this structure, values that are next to each other (e.g., universalism and benevolence) have compatible motivations, such that the choice to pursue one value can simultaneously promote the attainment of the other. Values that oppose each other in the circle (e.g., universalism and power) have conflicting motivations, such that the choice to pursue one value can inhibit the attainment of the other. Empirical support for the structure of values is substantial, with evidence from hundreds of samples across over 80 countries (Sagiv et al., 2017).

The compatibilities and conflicts among values in Schwartz's (1992) theory can be summarized by four higher order values that are located at the ends of two bipolar dimensions (see Figure 1). In the first dimension, self-transcendence opposes self-enhancement values, reflecting the conflict between values that express concern for the welfare of others, including the natural world (i.e., benevolence and universalism), and values that express the motivation

to pursue self-interests over the interests of others (i.e., power, achievement, and sometimes hedonism). In the second dimension, openness to change opposes conservation values, reflecting the conflict between values that express the desire for freedom and excitement (i.e., self-direction, stimulation, and sometimes hedonism), and values that express the desire to keep things as they are (i.e., conformity, security, and tradition).

The theory of human values (Schwartz, 1992) has been refined to represent a set of meaningful and conceptually distinct value facets around the motivational continuum (see Figure 1). Schwartz et al. (2012) partitioned the values circle into 19 motivationally distinct refined value facets with "greater universal heuristic and predictive power" than the ten basic or four higher order values (Schwartz et al., 2012 , p. 664). These refined values were derived from conceptual definitions of the 10 basic values and the identification of new constructs between basic values around the circle. Lee et al. (2019) further partitioned the basic universalism value to include the universalism-animals refined value. In our study, we focused on these 20 refined values, shown in Figure 1 and defined in Appendix A .

2.2. *Values and Sustainable Consumer Behavior*

People tend to behave in ways that are expressive of their value priorities to promote the attainment of goals that matter to them (Bardi & Schwartz, 2003; Schwartz, 2007). Associations between personal values and value expressive behaviors have generally been found to be systematic and predictable, in that they reflect the underlying motivational trade-offs in Schwartz's (1992) values circle (Bardi & Schwartz, 2003; Schwartz et al., 2017). Sustainable consumer behavior is no exception. Self-transcendence values, specifically universalism, have generally been positively associated with sustainable behaviors such as waste reduction and the reuse of goods (Barr, 2007), composting and recycling (Skimina et al., 2019; Thøgersen & Ölander, 2002), and general pro-environmental behaviors (Nordlund & Garvill, 2002). In contrast, the opposing self-enhancement values (i.e., power and achievement) have largely been found to be negatively associated with sustainable consumer behaviors (Jacobs et al., 2018; Nordlund & Garvill, 2002; Pepper et al., 2009).

Systematic relations between sustainable consumer behaviors and the opposing self-transcendence and self-enhancement values may be explained by the motivational content of these values. The self-transcendent universalism values are grounded in an acceptance of the realization that the survival of individuals and groups may be threatened by conflict caused by intolerance, injustice, and failure to protect the natural environment and the resources on which life depends (Schwartz, 2015). As such, it is unsurprising that people who prioritize these values tend to engage in behaviors that promote the preservation of the environment and protection of the welfare of all people. In contrast, the self-enhancing power and achievement values emphasize maintaining or gaining advantage for oneself (Schwartz, 2015). Thus, we would not expect people who prioritize these values to engage in behaviors to protect nature and promote the welfare of others at the expense of attaining personal control over resources and other people (i.e., power) or social status (i.e., achievement). This suggests that sustainable consumer behaviors are value expressive (Bardi & Schwartz, 2003; Lönnqvist et al., 2013) in that they are most likely to be positively related to self-transcendence values and negatively related to the opposing self-enhancement values (see Figure 1).

Research on relations between refined values and behaviors (Schwartz et al., 2017; Lönnqvist et al., 2013; Sneddon et al., 2020) shows that the more refined set of personal values has the potential to provide deeper insights into value-behavior relations than the 10 basic or 4 higher order values. This may also be the case for environmental actions, such as sustainable disposal behaviors. For example, Skimina et al. (2019) found that universalism-nature values were positively, and power-resources values negatively, associated with the frequency of performing four environmental actions (i.e., composting, habit change, reusing paper, and picking up litter). Relations between other refined values within the self-transcendence and self-enhancement domains and these environmental actions were less consistent.

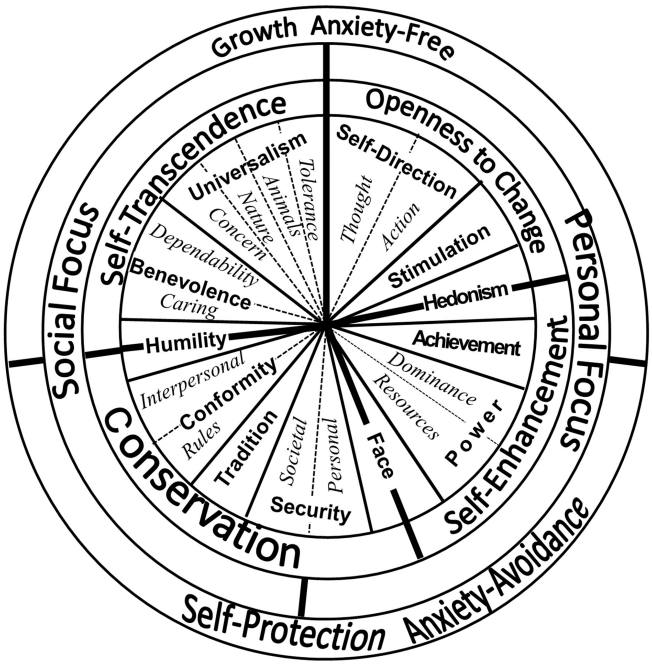

Figure 1. Basic and Refined Values

For instance, universalism-concern values were positively associated with only one of the four actions (i.e., picking up litter) and achievement values were negatively associated with three out of four actions (i.e., composting, habit change, and picking up litter). Given that there is some evidence that environmental actions are associated with refined self-transcendence and self-enhancement values in a way that reflects the content of these values, we expect to find similar patterns of association across four sustainable disposal behavior domains: recycling, donating unwanted possessions, composting waste, and membership of giving/sharing groups.

2.3. *Hypothesis Development*

In the current study, we examined relations between consumers refined values and their sustainable disposal behaviors. Specifically, we examined whether consumers' refined value priorities were associated with how frequently they recycled, composted, and donated goods over the past 12 months. We also examined relations between refined values and membership of giving/sharing groups (e.g., Freecycle, 'Buy Nothing'), as these groups facilitate sustainable disposal behavior by providing a platform for redistributing unwanted goods to other community members (Aptekar, 2016; Eden, 2017).

We expected both universalism-nature and universalism-concern values to be positively associated with sustainable disposal behavior across all four domains (i.e., recycling, donating, composting, and membership of giving/sharing groups). The content of the universalism-nature value (i.e., the preservation of the natural environment) may be expressed with disposal behaviors that protect the environment through the reduction of waste and/or the conservation of scarce resources. Although the content of universalism-concern values is not directly aligned with environmental protection, performing sustainable disposal behaviors may have positive consequences for the pursuit of the protection of all people, including future generations. Both universalism-nature and -concern values have been positively associated with pro-environmental behaviors (Lee et al., 2008; Skimina et al., 2019; Sneddon et al., 2020). However, we did

not expect the other refined universalism values (i.e., universalism-tolerance and -animals) to be positively associated with sustainable disposal behaviors, as the content of these values is not conceptually aligned with such behaviors. As such, we hypothesize that:

H1. The frequency of sustainable disposal behaviors will be positively associated with consumers' (a) universalism-nature and (b) universalism-concern values, and

H2. The proportion of consumers who belong to giving/sharing groups will be positively associated with (a) universalism-nature and (b) universalism-concern values.

Conversely, we expected the opposing power-resources and achievement values to be negatively associated with sustainable disposal behavior across all four domains (i.e., recycling, donating, composting, and membership of giving/sharing groups). The pursuit of power-resources values (i.e., power through control of material and social resources) and achievement values (i.e., success according to social standards) may be inhibited by performing sustainable disposal behaviors that are largely undertaken in the private sphere and require relinquishing control of resources. Both power-resources and achievement values have been negatively associated with pro-environmental behaviors (Skimina et al., 2019; Sneddon et al., 2020). However, we did not expect the other refined power value, power-dominance, which emphasizes exercising control over people, to be associated with sustainable disposal behaviors, as the content of this refined value is not conceptually aligned with such behaviors. As such, we hypothesize that:

H3. The frequency of sustainable disposal behaviors will be negatively associated with consumers' (a) power-resources and (b) achievement values, and

H4. The proportion of consumers who belong to giving/sharing groups will be negatively associated with (a) power-resources and (b) achievement values.

Potential associations between refined values within the openness to change and conservation value dimensions and sustainable disposal behaviors are less clear. For instance, the openness to change self-direction values have been both positively (Zibenberg et al., 2018; Skimina et al., 2019) and negatively (Sneddon et al., 2020; Skimina et al., 2019) associated with pro-environmental behaviors. Similarly, the conservation conformity values have been both negatively (Agissova & Sautkina, 2020; Skimina et al., 2019) and positively (Pepper et al., 2009) associated with pro-environmental behaviors.

When we consider the underlying motivational bases for values in the conservation and openness to change domains, we would not expect to find systematic relations with sustainable disposal behaviors. For instance, in the conservation domain, values derive from the survival requirements of the individual and the group (i.e., security), the avoidance of disrupting group functioning (i.e., conformity), and respect for practices that symbolize group solidarity (i.e., tradition) (Schwartz, 2015). In contrast, values in the openness to change domain derive from the need for autonomy and independence (i.e., self-direction), excitement and novelty (i.e., stimulation), and pleasure (i.e., hedonism). Therefore, as the content of conservation and openness to change values are not conceptually aligned with sustainable behaviors, we did not form specific hypotheses about relations between refined values in these domains and sustainable disposal behaviors. Instead, we examined whether patterns of associations between these values and sustainable disposal behaviors reflected those found in the neighboring self-transcendence and self-enhancement value domains.

3. Materials and Method

3.1. ***Participants and Procedures***

One thousand, one hundred and eighty-eight Australian adults (61% female; M_{age} = 48 years, SD = 15) were recruited via an online commercial panel provider to complete two online surveys (i.e., personal values and sustainable disposal behaviors) for which they were paid a small incentive. The current study was part of a larger project examining value-behavior relations in adults aged 18 to 75 years (see Lee et al., 2022 for details).

The surveys used in the current study were administered to respondents over several weeks as part of a series of short (5 to 10 minute) survey modules. This

approach was used to reduce common method bias and respondent fatigue (Hulland et al., 2018). The first survey measured respondents' personal values and the fourth survey measured respondents' self-reports of their sustainable disposal behaviors and membership of giving/sharing groups. Between these survey modules, respondents answered questions about states, traits, and wellbeing. The surveys used in the current study can be viewed here (OSF link omitted during review process). All surveys were approved by the (university name omitted during review process) Ethics Committee.

3.2. ***Measures***

Values. Refined values were measured with the Schwartz Best Worst Values Refined Survey (BWVr; Lee et al., 2019). In the BWVr survey respondents are asked to choose the most and least important values as guiding principles in their life from 21 subsets of 5 value items derived from a Youden balanced incomplete block design. In this design, each value item appears 5 times and each pair of value items appears together once across the 21 subsets (see Lee et al. (2019) for a detailed description of the BWVr). The simple count method was used to score values (Louviere et al., 2015). This approach calculates the score for each value item by subtracting the number of times it was chosen as least important from the number of times it was chosen as most important. This resulted in scores ranging from -1 to +1, with higher numbers reflecting greater value importance and zero being the midpoint of the scale.

Sustainable disposal behaviors. Respondents indicated how frequently they performed different disposal behaviors, relative to opportunity, in the past 12 months (i.e., "Think about when you are finished with a product. In the past 12 months, how frequently have you done the following, relative to the number of times you had an opportunity to do so?"). Ten sustainable disposal behaviors, from Gilg et al. (2005), were measured on a 5-point 'frequency relative to opportunity' scale (1 = never, 2 = rarely [about a quarter of the time], 3 = sometimes [about half of the time], 4 = usually [more than half the time], 5 = always), including a 'no opportunity' option (never had even one opportunity to do anything like this).

Specific disposal behaviors measured were recycling (glass, newspaper, cans, plastic bottles), reusing (glass, paper), composting (garden waste, kitchen waste), and donating (furniture to charity, clothes to charity). To capture frequency of in-group donations, we added one item to this scale, 'give away unwanted possessions to friends or family'. This item was measured on the same 5-point 'frequency relative to opportunity' scale. Respondents were also asked (Yes/No) whether they belonged to a local (or online) community group where they give away items that they no longer use and/or receive pre-loved items for free (e.g., the Buy Nothing Project, Paying it Forward, Freecycle).

3.3. ***Analytical strategy***

Sustainable disposal behaviors. To reduce the 11 sustainable disposal behaviors measured into a smaller subset of behavioral indices, these items were subject to an exploratory factor analysis with Varimax rotation. The Kaiser-Meyer-Olkin measure verified sampling adequacy (KMO = .772) and Bartlett's test of sphericity ($\chi^2_{(55)}$ = 6144.237, p = .000) indicated that the correlation structure of the items was adequate for factor analysis. Principal components analysis with a cut-off point of .40 and eigenvalues greater than 1 yielded a three-component solution with 2 items removed for substantial cross-loadings (i.e., reuse of paper and reuse of glass).

Component 1 (recycling) was comprised of 4 items that explained 38% of the variance with factor loadings from .809 to .895. Component 2 (donating) comprised 3 items that explained 23% of the variance with factor loadings from .809 to .845. Component 3 (composting) comprised 2 items that explained 16% of the variance with factor loadings from .949 to .954 (see Appendix B for the component matrix). The items loading onto each component were then averaged to produce scores for behavioral indices of recycling, donating, and composting (see Appendix B). Cronbach's alphas were acceptable for these indices (recycling α = .877, donating α = .782, composting α = .923).

Refined values. We ran correlations between

the 20 refined values to assess their distinctiveness. Inter-correlations ranged from r = −.35 (universalism-tolerance and power-resources) to r = .50 (power-resources and power-dominance). As expected, the highest positive correlations were between neighboring values and the highest negative correlations were between opposing values in the circle (see Appendix C).

Values and sustainable disposal behaviors. Given that correlational studies between refined values and environmental behaviors have produced only weak to moderate relations (Skimina et al., 2019; Sneddon et al., 2020), we focused on the role of refined value importance in associations with sustainable disposal behaviors.

Following Lee et al. (2022) , who proposed that associations between values and behavior were stronger at higher levels of the value importance distribution and weaker at lower levels, we compared the frequency of behaviors between respondents who were high on a value with those who were low on the same value. To do this, we divided respondents into value importance groups for each of the 20 refined values. According to Lee et al. (2022), a threshold for stronger value-behavior relations may be at or above the 70th percentile of the distribution of value importance. Conversely, a threshold for weaker value-behavior relations may be at or below the 20th to 30th percentile of the value importance distribution. To reflect this, we divided respondents' values scores into quartiles to create four value importance groups for each of the 20 refined values (see Appendix D). We then used independent samples t-tests to examine mean differences in the frequency of sustainable disposal behaviors between the high (i.e., top 75th quartile) and low (i.e., bottom 25th quartile) importance group for each refined value.

To compare membership of giving/sharing groups by value importance, we first examined differences in the proportion of membership between high and low value importance groups, using chi-squared analyses for the hypothesized values. We then used independent samples t-tests to compare the refined values scores of members of giving/sharing groups with non-members.

4. Results

4.1. ***Descriptive statistics***

Benevolence-dependability and benevolence-caring were the most important refined values at the sample level (M = 0.455, SD = 0.37; M = 0.450, SD = 0.34 respectively). Power-dominance and power-resources were the least important refined values at the sample level (M = -0.554, SD = 0.36; M = -0.463, SD = 0.43 respectively). This is in line with previous studies of refined values (Ballantyne et al., 2018; Schwartz et al., 2012). Means and standard deviations for all refined values are reported in Appendix D.

Recycling behaviors were the most frequently performed behaviors, followed by donating, and composting (see Table 1). The majority (90%) of respondents reported that they usually or always recycled when they had the opportunity to do so. Almost half of the sample reported either usually or always donating unwanted possessions (48%), and over one third reported usually or always composting their waste (40%). Relatively few individuals stated that they had not recycled (2%) or donated (3%) in the last 12 months, whereas over one third (34%) of respondents reported that they had not composted waste in the same period. Twenty-two percent of the sample (n = 263) reported being members of a giving/sharing group.

4.2. ***Refined value importance and sustainable disposal behaviors***

Recycling. We found that those in the high importance group for universalism-concern values ($t_{(753.474)}$ = 4.63, p < .001) and universalism-nature values ($t_{(506.354)}$ = 4.63, p < .001) reported significantly higher frequencies of recycling behaviors than respondents in the low importance group for these values. Thus, H1a-b was supported for recycling. In contrast, those in the high importance group for achievement values ($t_{(628.053)}$ = -5.68, p < .001) and power-resources values ($t_{(362.935)}$ = -4.43, p < .001) reported significantly lower frequencies of recycling behaviors than respondents in the low importance group for these values. Thus, H3a-b was also supported for recycling.

In addition to the hypothesized relations, we found a similar pattern of associations between

Table 1. Sustainable Disposal Behaviors

Sustainable Disposal Behaviors [1]	**Mean**
Recycling	4.53 (0.86)
Donating	3.63 (1.14)
Composting	2.90 (1.66)

[1] N = 1,188. Standard deviations in parentheses.

the frequency of recycling and the importance of neighboring refined values in the higher order self-transcendence and self-enhancement domains. Specifically, we found that those in the high importance group for universalism-animals ($t_{(559.386)}$ = 2.63, p = .009), universalism-tolerance ($t_{(410.689)}$ = 3.34, p = .001), benevolence-caring ($t_{(426.193)}$ = 3.60, p < .001), and benevolence-dependability ($t_{(445.118)}$ = 4.47, p < .001) values reported higher frequencies of recycling behaviors than those in the low importance group for these values. In contrast, those in the high importance group for the opposing power-dominance ($t_{(465.562)}$ = -4.50, p < .001) and face ($t_{(484.292)}$ = -5.35, p < .001) values reported significantly lower frequencies of recycling behaviors than those in the low importance group for these values.

In the conservation values domain, those in the high importance group for the security-societal value ($t_{(454.564)}$ = 2.81, p = .005) reported higher frequencies of recycling than those in the low importance group for this value. In contrast, those in the high importance group for the opposing stimulation value ($t_{(456.480)}$ = -1.98, p = .048) reported lower frequencies of recycling than those in the low importance group for this value (See Appendix E for all recycling results).

Donating. We found that those in the high importance group for universalism-concern ($t_{(754)}$ = 3.48, p = .001) and universalism-nature ($t_{(588)}$ = 4.62, p < .001) values reported significantly higher frequencies of donating than respondents in the low importance group for these values. Thus, H1a-b was supported for donating. In contrast, those in the high importance group for achievement values ($t_{(647)}$ = -3.41, p = .001) reported significantly lower frequencies of donating than respondents in the low importance group for this value, supporting H3b for donating. However, there was only a marginal difference in the frequency of donating between the high and low importance groups for power-resources values ($t_{(389)}$ = -1.90, p = .058). Thus, H3a was rejected for donating.

In addition to the hypothesized relations, we also found that those in the high importance group for universalism-animals ($t_{(565)}$ = 3.15, p = .002) and benevolence-dependability ($t_{(603)}$ = 2.25, p = .025) values reported significantly higher frequencies of donating than respondents in the low importance group for these values. In contrast, those in the high importance group for the opposing face value ($t_{(484.292)}$ = -3.98, p < .001) reported significantly lower frequencies of donating than those in the low importance group for this value. However, there were no significant differences in frequency of donating between respondents in high versus low importance groups for any of the refined values in the conservation and openness to change dimensions (See Appendix E for all donating results).

Composting. We found that those in the high importance group for universalism-concern ($t_{(754)}$ = 2.52, p = .012) and universalism-nature ($t_{(587.774)}$ = 5.72, p < .001) values reported significantly higher frequencies of composting than respondents in the low importance group for these values. Thus, H1a-b was supported for composting. In contrast, there were no significant differences in frequency of composting between the high and low importance group for achievement ($t_{(647)}$ = -1.72, p = .086) or power-resources ($t_{(389)}$ = 1.64, p = .102) values. Thus, H3a-b was rejected for composting.

In addition to the hypothesized relations, we found that those in the high importance group for benevolence-caring ($t_{(551)}$ = -3.20, p < .001) and benevolence-dependability ($t_{(603)}$ = -2.20, p = .028) values reported significantly lower frequencies of

composting than those in the low importance group for these values. In the openness to change domain, those in the high importance group for self-direction action ($t_{(539)}$ = -3.24, p < .001) and hedonism ($t_{(729)}$ = -4.42, p < .001) values reported significantly lower frequencies of composting than those in the low importance group for these values. In the conservation domain we found that those in the high importance group for security-personal ($t_{(524.078)}$ = -2.90, p = .004) and security-societal ($t_{(459)}$ = -3.09, p = .002) values reported significantly lower frequencies of composting than those in the low importance group for these values (see Appendix E for all composting results).

Membership of giving/sharing groups. Contrary to our expectations, no differences were found in the proportion of members of a giving/sharing group in the high versus low importance groups for either universalism-nature or universalism-concern values (see Table 2). Thus, H2a-b was rejected. Instead, we found that those in the high importance group for the opposing achievement ($\chi^2_{(1)}$ = 9.97, p = .002) and power-dominance ($\chi^2_{(1)}$ = 4.70, p = .030) values were more likely to be members of a giving/sharing group than those in the low importance group for these values. Thus, H4a-b was also rejected.

In addition to the hypothesized relations, those in the high importance group for the benevolence-dependability value were less likely to be members of a giving/sharing group, compared with those in the low importance group for this value ($\chi^2_{(1)}$ = 14.58, p < .001). However, there were no significant differences in the proportion of members of a giving/sharing group in high versus low importance groups for any of the refined values in the conservation and openness to change dimensions.

To explore relations between values and membership further, we used independent samples t-tests to compare the refined values of giving/sharing group members and non-members. In line with the results of the chi-squared analysis, we found that group members had significantly higher achievement ($t_{(1186)}$ = 3.09, p = .002) and power-dominance ($t_{(400.05)}$ = 2.62, p = .009) values and significantly lower benevolence-dependability ($t_{(1186)}$ = -4.13, p < .001) values than non-members. There were no significant differences in the refined value priorities of members and non-members in the conservation and openness to change dimensions (see Appendix F for all membership results).

5. Discussion

Faced with a growing household waste problem (Kaza et al., 2018), governments and other institutions around the world have engaged in the development of initiatives aimed at promoting consumer engagement in sustainable product disposal solutions. The current study examined relations between consumers' refined value priorities and their sustainable disposal behaviors to help both policy makers and practitioners better understand how individual differences in this central aspect of consumers' personality may influence their disposal behavior. To this end, we show for the first time that the importance of consumers refined values are closely associated with their sustainable disposal behavior across four domains (i.e., recycling, donating, composting, and membership of giving/sharing groups). These results add to the existing values and environmental behavior literature, which has largely focused on relations between a relatively small set of broad values and recycling behavior (Mccarty & Shrum, 2001). In the current study we hypothesized and found that universalism-nature, universalism–concern, achievement, and power-resources values are associated with the frequency of performing a range of different sustainable disposal behaviors. Consistent with our predictions, we found that consumers with high universalism-nature and -concern values recycled, donated, and composted waste more frequently than those low on these values. In contrast, consumers who were high on the opposing achievement and power-resources values reported lower frequencies of recycling than those low on these values.

That the reported patterns of frequency of recycling were consistent with both hypothesized and neighboring refined values in the self-transcendence and self-enhancement domains may be a consequence of this being the most common behavior among

Table 2. Low and High Value Importance Groups and Proportions of Membership in Giving/Sharing Groups

Refined values	Proportion of group membership in value importance groups		χ^2 (1)	p
	Low	Hight		
Universalism-concern	20.0	24.3	2.00	.157
Universalism-nature	22.8	23.9	0.11	.737
Universalism-animals	22.6	22.5	0.00	.982
Universalism-tolerance	26.5	20.8	2.20	.138
Self-direction thought	23.0	21.4	0.16	.692
Self-direction action	20.7	21.5	0.04	.834
Stimulation	22.1	19.2	0.59	.443
Hedonism	19.3	20.7	0.21	.644
Achievement	16.4	26.4	9.97	.002
Power-dominance	19.2	27.9	4.70	.030
Power-resources	17.9	25.4	3.02	.082
Face	25.9	22.4	0.81	.369
Security-personal	24.1	19.0	2.42	.120
Security-societal	25.8	20.8	1.62	.204
Tradition	18.9	24.3	2.03	.155
Conformity-rules	23.5	19.1	1.67	.197
Conformity-interpersonal	21.8	23.1	0.11	.740
Humility	25.2	20.2	1.84	.174
Benevolence-caring	26.0	20.7	2.17	.141
Benevolence-dependability	31.7	18.2	14.58	.000

respondents. These results suggest that recycling may be value expressive, in that the frequency of this behavior is positively related with refined self-transcendence values and negatively related with refined self-enhancement values.

We also found some systematic relations between recycling and refined values in the conservation and openness to change domains, with security-societal having a positive and the opposing stimulation values having a negative effect on frequency of recycling. It may be the case that security-societal values, which emphasize safety and stability of the wider society, may be pursued through engagement in actions that contribute to social order, such as recycling, aimed at reducing litter in one's community. In contrast, recycling may have negative consequences for the pursuit of stimulation values, which emphasize excitement, novelty, and change, in that this behavior may be seen as unexciting and taking time away from thrilling and risky activities that promote this life goal (Skimina et al., 2019).

We found different patterns of associations between hypothesized refined values and frequency of donating and composting. As expected, people in the high importance group for universalism-nature and universalism-concern values reported higher frequencies of donating. This pattern was also found for benevolence-dependability values, which emphasize being a reliable and trustworthy member of the in-group. While it may be the case that this value can be pursued through the donation of unwanted possessions, further research is required to examine whether people high on benevolence-dependability are more likely to donate to members of their in-group (i.e., family and friends) as opposed to their out-group (e.g., donating goods to charity).

In the self-enhancement domain, those high on achievement values reported lower frequencies of donating than those low on this value, but only marginal differences were found between power-resources value importance groups. Instead, face, which neighbors power-resources and security-personal values in the circle (see Figure 1), was associated with frequency of donating. It may be the case that people high on achievement and face values donate less than those low on these values because this is typically a private sphere behavior. As such, it is unlikely to promote success according to social standards (i.e., achievement values) or the maintenance of one's public image (face).

No differences were found in the frequency of donating between high and low importance groups for refined values in the conservation and openness to change domains. This suggests that donating unwanted possessions is not expressive of values in these domains.

Composting appears to be expressive of a much narrower set of refined self-transcendence values (i.e., universalism-nature and –concern) than recycling and donating. Interestingly, we found that the self-transcendent benevolence values were negatively associated with the frequency of composting waste. It may be the case that while benevolence values share an emphasis on concern for the welfare and interests of others with the neighboring universalism-concern value, they differ in that they focus on the welfare of the in-group (i.e., family and friends) rather than the out-group (i.e., all people). Perhaps people who ascribe a high importance to benevolence values avoid composting because this may either detract from caring for family and friends or may not accrue positive consequences for caring for the welfare of close others.

While we did not find any associations between self-enhancement values and composting frequency, we did find that this behavior was constrained by refined values in both the conservation and openness to change domains. Specifically, we found negative associations between frequency of composting and self-direction action and hedonism values, as well as with the opposing security-societal and security-personal values. With the exception of hedonism values, these results are somewhat at odds with Skimina et al.'s (2019) study of environmental actions. However, given that composting waste is generally a time consuming, effortful, and messy activity (Edgerton et al., 2009), it is unlikely to promote the pursuit freedom to determine one's actions (i.e., self-direction action values) and pleasure and sensuous gratification (i.e., hedonism values) or the pursuit of safety for oneself (i.e., security-personal) and in the wider society (i.e., security-societal).

An important point to note is that the mean frequencies of recycling and donating were higher than for composting (see Table 1) at the sample level and in the low and high importance groups for all refined values (see Appendix E). This may indicate that recycling and donating are either more normative than composting or simply easier to perform. Thus, our study not only confirms the importance of refined values in explaining sustainable disposal behaviors but is also consistent with evidence that shows context matters for such behaviors. After all, behavior reflects the interplay of personal values and situational factors (Skimina et al., 2019). Context in this case can simply refer to the availability of recycling bins and donation drop-off locations. That said, donating was found to be less frequent than recycling, which likely reflects the relative ease of recycling compared to taking items to a donation point. Composting was the least frequently performed behavior in our study. In order to compost effectively, time, equipment and knowhow are required and although various municipalities have begun to provide green waste collection bins for households, composting household waste remains a relatively effortful behavior (Edgerton et al., 2009).

Our findings regarding refined values and membership of giving/sharing groups are at odds with our hypotheses and the patterns of relations between refined values and recycling, donating, and composting. That people high on achievement and power-dominance values were more likely to be members of such groups than those low on these values suggests that belonging to a giving/sharing group may promote the attainment of more self-enhancing

values. Specifically, group membership may provide an opportunity for those who prioritize achievement values to signal their success to others through their ability to give away possessions they no longer require in a highly visible manner (unlike donating goods to charity). In terms of power-dominance values, it may be the case that membership of such groups allows people high on these values to exercise some control over group members. In contrast, people high on benevolence-dependability values may avoid membership of such groups as a mode of donating unwanted possessions. Instead they may choose to donate to family and friends in pursuit of being a reliable and trustworthy member of their in-group. There is some evidence to support this, in that people high on benevolence-dependability were found to be more likely to donate than those low on this value.

In line with our findings on the frequency of donating behavior, no differences were found in the proportion of members of giving/sharing groups between high and low importance groups for refined values in the conservation and openness to change domains. This suggests that membership of such groups is not expressive of values in these domains.

5.1. ***Implications***

In this study, we go some way toward understanding how individual differences in refined value importance are associated with a range of sustainable disposal behaviors. Shedding light on the associations between consumers' refined values and sustainable disposal behaviors has important implications for both theory and practice. First, this study extends our understanding of the role of refined values and value importance beyond associations with everyday behaviors (Lee et al., 2022) and environmental actions (Skimina et al., 2019) to a broader range of sustainable disposal behaviors.

Second, our findings challenge the results of some studies of values and sustainable disposal behaviors. For example, our results differ from Barr's (2007) study of recycling intentions and behavior, which did not find statistically significant associations between personal values and these behavior Barr (2007) argued that recycling is a normative behavior in the UK, and therefore norms accounted for greater variance in recycling behavior than values. Since our results suggest that the importance of refined values is associated with recycling frequency, our study could act as a catalyst for more research on the interplay between values and environmental/contextual factors in explaining sustainable disposal behaviors.

Third, our results suggest that one way to encourage sustainable disposal behaviors among those whose values are not typically aligned with these behaviors (e.g., recycling, donating, composting) may be encouraged to join giving/sharing groups. These groups appear to be successful at engaging people who ascribe relatively high importance to self-enhancement values. Our work provides an impetus for more research exploring the reasons behind this behavior. Future studies could examine whether people who ascribe relatively high importance to self-enhancement values participate in giving/sharing groups as a way of impressing others, signaling personal success in the possessions they give away, or gaining control over other people and resources.

Some potential limitations should also be acknowledged. Self-reports were used to measure consumers' personal values and sustainable disposal behaviors. While self-reports are commonly used in personal values research (Lee et al., 2022), it may be the case that using self-reports of sustainable disposal behaviors may have introduced social-desirability and consistency biases, potentially amplifying value-behavior relations. Future studies could consider including more objective measures of disposal behavior, such as naturalistic or peer observation (Yu-Long & San-Pui, 2011). Caution should also be taken with the generalization of non-hypothesized results, as much of our analysis was exploratory in nature. More research is needed to replicate and extend our results to other samples, contexts, and disposal behaviors. Further, while we focused on associations between the importance of refined values and sustainable disposal behaviors, there may be other factors that influence these relations (e.g., age, gender, socio-economic status). Future studies should control for these factors and examine potential moderating effects of contextual factors

(e.g., availability of recycling bins, location of donation drop-off points, access to community giving/sharing groups) on relations between values and sustainable disposal behaviors.

Despite these limitations, our results provide evidence that there are predictable patterns of associations between refined value importance and a range of sustainable disposal behaviors. We show that consumers refined value priorities are associated with their sustainable disposal behaviors in ways that reflect the content of values. Our study not only makes several substantive theoretical contributions, but also has the potential to inform the design of promotional messages and policies aimed at engaging consumers in sustainable disposal behaviors.

Acknowledgments

Would like to thank Professor Julie Lee from the Centre of Human and Cultural Values at the University of Western Australia for her support in the development of this study. This research was funded by an Australian Research Council Linkage grant in partnership with Pureprofile (Project LP150100434).

Conflict of interest

No potential conflict of interest was reported by the authors.

Cite as

Sneddon, J., Evers, U., & Gruner, R. (2022). An Exploration of the Role of Refined Value Importance in Consumers' Sustainable Disposal Behaviors. *Journal of Sustainable Marketing*, 3(2), 127-147. https://doi.org/10.51300/jsm-2022-60

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Appendix A. Basic and Refined Values with Definitions

10 Basic Values	20 Refined Values	Definitions
Self-direction	Self-direction thought	Freedom to cultivate one's own ideas and abilities
	Self-direction action	Freedom to determine one's own actions
Stimulation	Stimulation	Excitement, novelty and change
Hedonism	Hedonism	Pleasure and sensuous gratification
Achievement	Achievement	Success according to social standards
Power	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	Security-personal	Safety in one's immediate environment
	Security-societal	Safety and stability in the wider society
Tradition	Tradition	Maintaining and preserving cultural, family, or religious traditions
Conformity	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	Benevolence-caring	Devotion to the welfare of in-group members
	Benevolence-dependability	Being a reliable and trustworthy member of the in-group
Universalism	Universalism-concern	Commitment to equality, justice and protection for all people
	Universalism-nature	Preservation of the natural environment
	Universalism-animals	Empathic concern for the welfare of all animals
	Universalism-tolerance	Acceptance and understanding of those who are different to oneself

Appendix B. Sustainable Disposal Behavior Items

Recycle plastic bottles
Recycle cans
Recycle newspaper
Recycle glass
Donate furniture to charity
Donate clothes to charity
Give away unwanted possessions to friends or family
Compost kitchen waste
Compost garden waste
Reuse glass
Reuse paper

Sustainable Disposal Behavior Items and Principal Component Solution

Items[1]	Recycling	Donating	Composting
Recycle plastic bottles	**.895**	.037	.006
Recycle cans	**.895**	.081	.025
Recycle newspaper	**.809**	.124	.084
Recycle glass	**.813**	.131	.054
Donate furniture to charity	.076	**.845**	.155
Donate clothes to charity	.154	**.819**	.067
Give away unwanted possessions to friends or family	.067	**.809**	.094
Compost kitchen waste	.038	.134	**.954**
Compost garden waste	.077	.146	**.949**
Eigenvalue	3.417	2.111	1.408
Percentage of variance explained	38%	23%	16%

[1]N = 1,188. Component matrix for principal components analysis with Varimax rotation with Kaiser Normalization. Number of factors based on scree plot and eigenvalues greater than 1.

Appendix C. Correlations Between Refined Values[1]

	SDT	SDA	STI	HED	ACH	POD	POR	FAC	SEP	SES	TRA	COR	COI	HUM	BEC	BED	UNC	UNN	UNA	UNT
SDT		.177**	.117**	.036	.005	.078**	-.037	-.084**	-.173**	-.209**	-.224**	-.221**	-.251**	-.068*	-.064*	-.108**	-.045	.034	-.066*	.015
SDA	.177**		.083**	.068*	.037	.022	.055	-.102**	-.029	.004	-.156**	-.162**	-.213**	-.086**	-.134**	-.141**	-.136**	-.054	-.101**	-.049
STI	.117**	.083**		.447**	.046	-.019	.004	-.148**	-.058*	-.090**	-.154**	-.237**	-.099**	-.149**	-.048	-.044	-.257**	-.162**	-.111**	-.056
HED	.036	.068*	.447**		.054	-.093**	.064*	-.155**	.077**	.044	-.159**	-.222**	-.138**	-.191**	-.011	-.023	-.226**	-.154**	-.121**	-.161**
ACH	.005	.037	.046	.054		.342**	.424**	.164**	-.022	-.073*	-.148**	-.159**	-.197**	-.195**	-.238**	-.254**	-.269**	-.188**	-.168**	-.289**
POD	.078**	.022	-.019	-.093**	.342**		.500**	.182**	-.119**	-.193**	-.171**	-.081**	-.114**	-.102**	-.322**	-.315**	-.272**	-.117**	-.128**	-.251**
POR	-.037	.055	.004	.064*	.424**	.500**		.210**	.030	-.058*	-.134**	-.100**	-.146**	-.261**	-.334**	-.321**	-.321**	-.166**	-.157**	-.353**
FAC	-.084**	-.102**	-.148**	-.155**	.164**	.182**	.210**		.101**	-.047	-.023	-.043	-.001	.149**	-.183**	-.156**	-.192**	-.223**	-.144**	-.234**
SEP	-.173**	-.029	-.058*	.077**	-.022	-.119**	.030	.101**		.380**	-.088**	.099**	-.082**	-.094**	-.002	.068*	-.243**	-.123**	-.128**	-.251**
SES	-.209**	.004	-.090**	.044	-.073*	-.193**	-.058*	-.047	.380**		-.101**	.108**	-.096**	-.138**	.066*	.046	-.047	-.044	-.117**	-.101**
TRA	-.224**	-.156**	-.154**	-.159**	-.148**	-.171**	-.134**	-.023	-.088**	-.101**		.112**	.110**	.163**	.033	.050	.061*	-.142**	-.153**	-.020
COR	-.221**	-.162**	-.237**	-.222**	-.159**	-.081**	-.100**	-.043	.099**	.108**	.112**		.171**	.041	-.022	.023	-.005	-.096**	-.107**	-.038
COI	-.251**	-.213**	-.099**	-.138**	-.197**	-.114**	-.146**	-.001	-.082**	-.096**	.110**	.171**		.076**	.010	.058*	-.023	-.082**	.002	.035
HUM	-.068*	-.086**	-.149**	-.191**	-.195**	-.102**	-.261**	.149**	-.094**	-.138**	.163**	.041	.076**		-.016	.033	-.004	-.038	-.076**	.050
BEC	-.064*	-.134**	-.048	-.011	-.238**	-.322**	-.334**	-.183**	-.002	.066*	.033	-.022	.010	-.016		.431**	.139**	-.152**	-.080**	.125**
BED	-.108**	-.141**	-.044	-.023	-.254**	-.315**	-.321**	-.156**	.068*	.046	.050	.023	.058*	.033	.431**		.006	-.183**	-.106**	.130**
UNC	-.045	-.136**	-.257**	-.226**	-.269**	-.272**	-.321**	-.192**	-.243**	-.047	.061*	-.005	-.023	-.004	.139**	.006		.290**	.234**	.261**
UNN	.034	-.054	-.162**	-.154**	-.188**	-.117**	-.166**	-.223**	-.123**	-.044	-.142**	-.096**	-.082**	-.038	-.152**	-.183**	.290**		.401**	.113**
UNA	-.066*	-.101**	-.111**	-.121**	-.168**	-.128**	-.157**	-.144**	-.128**	-.117**	-.153**	-.107**	.002	-.076**	-.080**	-.106**	.234**	.401**		.057
UNT	.015	-.049	-.056	-.161**	-.289**	-.251**	-.353**	-.234**	-.251**	-.101**	-.020	-.038	.035	.050	.125**	.130**	.261**	.113**	.057	

[1] = 1,188. Pearson's correlations. *$p < .05$; ** $p < .01$; SDT = Self-direction thought, SDA = Self-direction action, STI = Stimulation, HED = Hedonism, ACH = Achievement, POD = Power-dominance, POR = Power-resources, FAC = Face, SEP = Security-personal, SES = Security-societal, TRA = Tradition, COR = Conformity-rules, COI = Conformity-interpersonal, HUM = Humility, BEC = Benevolence-caring, BED = Benevolence-dependability, UNC = Universalism-concern, UNN = Universalism-nature, UNA = Universalism-animals, UNT = Universalism-tolerance.

Appendix D. Refined Values Scores for the Sample and High and Low Value Importance Groups[1]

Refined values	Mean values score	Low (bottom 25%)	n	High (top 25%)	n
SDT	0.015 (0.34)	-0.483	213	0.526	224
SDA	0.180 (0.33)	-0.304	169	0.576	372
STI	-0.006 (0.36)	-0.518	226	0.530	234
HED	0.089 (0.38)	-0.328	383	0.557	348
ACH	-0.360 (0.43)	-0.858	311	0.192	338
POD	-0.554 (0.36)	-1.000	193	-0.023	276
POR	-0.463 (0.43)	-1.000	151	0.245	240
FAC	-0.346 (0.34)	-0.821	197	0.122	295
SEP	0.259 (0.31)	-0.054	419	0.714	258
SES	0.389 (0.32)	-0.074	240	0.866	221
TRA	-0.258 (0.43)	-0.774	338	0.461	177
COR	-0.019 (0.37)	-0.566	230	0.381	362
COI	-0.228 (0.37)	-0.726	280	0.331	195
HUM	-0.103 (0.32)	-0.517	294	0.346	247
BEC	0.450 (0.34)	-0.053	219	0.859	334
BED	0.455 (0.37)	-0.072	243	0.883	362
UNC	0.263 (0.37)	-0.112	435	0.731	321
UNN	0.108 (0.38)	-0.377	281	0.609	309
UNA	0.084 (0.42)	-0.444	283	0.643	284
UNT	0.211 (0.37)	-0.332	223	0.717	265

[1] N = 1,188. Standard deviations in parentheses. SDT = Self-direction thought, SDA = Self-direction action, STI = Stimulation, HED = Hedonism, ACH = Achievement, POD = Power-dominance, POR = Power-resources, FAC = Face, SEP = Security- personal, SES = Security-societal, TRA = Tradition, COR = Conformity-rules, COI = Conformity-interpersonal, HUM = Humility, BEC = Benevolence-caring, BED = Benevolence-dependability, UNC = Universalism-concern, UNN = Universalism- nature, UNA = Universalism-animals, UNT = Universalism-tolerance.

Appendix E. Independent Samples t-tests Comparing Low and High Value Importance Groups for Frequency of Recycling, Donating, and Composting Behaviors[1]

	Recycling Frequency Values groups					Donating Frequency Values groups					Composting Frequency Values groups				
Values	Low	High	t	p	d	Low	High	t	p	d	Low	High	t	p	d
UNC	4.40 (0.95)	4.68 (0.72)	4.63	.000	.33	3.50 (1.15)	3.79 (1.16)	3.48	.001	0.26	2.74 (1.64)	3.05 (1.68)	2.52	.012	0.19
UNN	4.35 (0.99)	4.68 (0.72)	4.63	.000	.39	3.43 (1.17)	3.87 (1.14)	4.62	.000	0.38	2.55 (1.55)	3.31 (1.67)	5.72	.000	0.47
UNA	4.43 (0.91)	4.62 (0.82)	2.63	.009	.22	3.41 (1.19)	3.73 (1.19)	3.15	.002	.026	2.74 (1.63)	2.93 (1.74)	1.32	.187	0.11
UNT	4.36 (1.01)	4.64 (0.77)	3.34	.001	.31	3.55 (1.17)	3.74 (1.10)	1.85	.065	0.17	3.04 (1.65)	2.95 (1.64)	-0.58	.559	-0.05
SDT	4.47 (0.91)	4.56 (0.80)	1.04	.301	.10	3.65 (1.12)	3.53 (1.24)	-1.13	.260	-0.11	2.81 (1.64)	2.93 (1.68)	0.70	.483	0.07
SDA	4.48 (0.93)	4.52 (0.79)	0.44	.659	.04	3.74 (1.11)	3.56 (1.17)	-1.66	.098	-0.15	3.22 (1.61)	2.73 (1.66)	-3.24	.001	-0.30
STI	4.62 (0.83)	4.46 (0.91)	-1.98	.048	-.19	3.63 (1.19)	3.45 (1.13)	-1.59	.112	-0.15	3.02 (1.68)	2.81 (1.62)	-1.42	.155	-0.13
HED	4.57 (0.85)	4.47 (0.91)	-1.49	.137	-.11	3.66 (1.13)	3.54 (1.15)	-1.42	.156	-0.11	3.14 (1.67)	2.59 (1.64)	-4.42	.000	-0.33
ACH	4.71 (0.74)	4.33 (0.96)	-5.68	.000	-.44	3.79 (1.10)	3.49 (1.16)	-3.41	.001	-0.27	3.05 (1.70)	2.83 (1.62)	-1.72	.086	-0.14
POD	4.62 (0.75)	4.26 (1.10)	-4.50	.000	-.40	3.61 (1.13)	3.56 (1.19)	-0.45	.653	-0.04	2.73 (1.68)	2.94 (1.62)	1.40	.161	0.13
POR	4.65 (0.84)	4.23 (1.02)	-4.43	.000	-.44	3.72 (1.12)	3.48 (1.20)	-1.90	.058	-0.20	2.71 (1.66)	2.99 (1.63)	1.64	.102	0.17
FAC	4.76 (0.57)	4.39 (0.95)	-5.35	.000	-.45	3.92 (1.08)	3.51 (1.15)	-3.98	.000	-0.37	2.95 (1.71)	2.99 (1.61)	0.28	.779	0.03
SEP	4.52 (0.84)	4.54 (0.87)	0.37	.711	.03	3.64 (1.12)	3.53 (1.16)	-1.29	.198	-0.10	3.07 (1.61)	2.69 (1.69)	-2.90	.004	-0.23
SES	4.35 (0.96)	4.58 (0.80)	2.81	.005	.26	3.59 (1.16)	3.53 (1.15)	-0.58	.564	-0.05	3.16 (1.64)	2.69 (1.66)	-3.09	.002	-0.29
TRA	4.53 (0.87)	4.41 (0.98)	-1.40	.164	-.13	3.48 (1.23)	3.54 (1.14)	0.57	.570	0.05	2.78 (1.67)	2.98 (1.63)	1.33	.186	0.12
COR	4.54 (0.81)	4.51 (0.89)	-0.39	.700	-.03	3.60 (1.15)	3.64 (1.14)	0.38	.708	0.03	2.86 (1.63)	3.03 (1.66)	1.24	.217	0.10
COI	4.53 (0.91)	4.49 (0.86)	-0.52	.597	-.05	3.52 (1.23)	3.60 (1.07)	0.71	.477	0.07	2.63 (1.66)	2.77 (1.65)	0.86	.390	0.08
HUM	4.50 (0.86)	4.49 (0.88)	-0.16	.877	-.01	3.70 (1.12)	3.62 (1.12)	-0.79	.428	-0.07	2.85 (1.70)	3.11 (1.61)	1.80	.072	0.16
BEC	4.30 (0.96)	4.59 (0.85)	3.60	.000	.32	3.60 (1.23)	3.57 (1.15)	-0.23	.820	-0.02	3.10 (1.62)	2.64 (1.66)	-3.20	.001	-0.28
BED	4.28 (1.01)	4.62 (0.82)	4.47	.000	.39	3.48 (1.17)	3.69 (1.07)	2.25	.025	0.19	3.03 (1.62)	2.74 (1.64)	-2.20	.028	-0.18

[1]N =1,188; Standard deviations in parentheses; d = Cohen's d; UNC =Universalism-concern, UNN = Universalism-nature, UNA = Universalism-animals,UNT = Universalism-tolerance, SDT = Self-direction thought, SDA = Self-direction action, STI = Stimulation,HED = Hedonism, ACH = Achievement, POD = Power-dominance, POR =Power-resources, FAC = Face, SEP = Security-personal, SES = Security-societal, TRA = Tradition, COR = Conformity-rules, COI = Conformity-interpersonal, HUM = Humility, BEC = Benevolence-caring, BED = Benevolence-dependability.

Appendix F. Mean Differences in the Values of Giving/Sharing Group Members and Non-members

Values	Group Membership		t	p	d
	Yes	No			
Self-direction thought	0.01	0.02	-0.11	.912	-0.01
Self-direction action	0.16	0.31	-1.25	.210	-0.09
Stimulation	-0.03	0.00	-1.34	.181	-0.09
Hedonism	0.09	0.09	0.22	.827	0.02
Achievement	-0.29	-0.38	3.09	.002	0.22
Power-dominance	-0.50	-0.57	2.62	.009	0.19
Power-resources	-0.43	-0.47	1.60	.110	0.11
Face	-0.35	-0.34	-0.39	.694	-0.03
Security-personal	0.23	0.27	-1.94	.053	-0.14
Security-societal	0.37	0.40	-1.38	.170	-0.10
Tradition	-0.22	-0.27	1.46	.145	0.10
Conformity-rules	-0.04	-0.01	-1.23	.218	-0.09
Conformity-interpersonal	-0.21	-0.23	0.76	.445	0.05
Humility	-0.12	-0.10	-0.80	.424	-0.06
Benevolence-caring	0.42	0.46	-1.84	.066	-0.13
Benevolence-dependability	0.37	0.48	-4.13	.000	-0.29
Universalism-concern	0.29	0.26	1.30	.194	0.09
Universalism-nature	0.12	0.10	0.80	.426	0.06
Universalism-animals	0.11	0.08	1.08	.281	0.08
Universalism-tolerance	0.18	0.22	-1.41	.160	-0.10