



ELSEVIER

Available online at [www.sciencedirect.com](http://www.sciencedirect.com)



Personality and Individual Differences 43 (2007) 1583–1593

PERSONALITY AND  
INDIVIDUAL DIFFERENCES

[www.elsevier.com/locate/paid](http://www.elsevier.com/locate/paid)

## Personality predictors of Consumerism and Environmentalism: A preliminary study

Jacob B. Hirsh \*, Dan Dolderman

*Department of Psychology, University of Toronto, Sidney Smith Hall, 100 St. George Street, Toronto, Ontario, Canada M5S 3G3*

Received 5 February 2007; received in revised form 1 April 2007; accepted 16 April 2007  
Available online 6 June 2007

---

### Abstract

Consumerism and Environmentalism are often viewed as mutually opposing constructs. While the former emphasizes the accumulation and consumption of material resources, the latter advocates resource conservation and long-term sustainability. Highly materialistic individuals are known to be selfish, possessive, and to place a greater value on the accumulation of material possessions. Conversely, environmentally concerned individuals are more often motivated by compassion, social concern, and a broader self-concept. In this study, we show that Consumerism and Environmentalism can both be predicted by the personality trait of Agreeableness. We assessed the personality, consumer goals, and environmental attitudes of undergraduate students at the University of Toronto. While Consumerism was negatively associated with Agreeableness, Environmentalism was positively associated with both Agreeableness and Openness. These findings are discussed in terms of the broader relationship between values and personality traits.

© 2007 Elsevier Ltd. All rights reserved.

*Keywords:* Consumerism; Environmentalism; Personality; Big Five; Values

---

\* Corresponding author. Tel.: +1 416 946 5812; fax: +1 416 978 4811.  
E-mail address: [jacob.hirsh@utoronto.ca](mailto:jacob.hirsh@utoronto.ca) (J.B. Hirsh).

## 1. Introduction

Attempts to understand the psychological factors contributing to Consumerism and Environmentalism have largely focused on the role of values, beliefs, and personal norms (e.g., Bamberg, 2003; Dietz, Fitzgerald, & Shwom, 2005; Dietz, Stern, & Guagnano, 1998). According to these models, specific environmental behaviours are motivated when a personal norm associated with a particular value becomes activated. Values themselves are thus understood as higher-order life orientations that inform one's daily goal-directed behaviours (Rokeach, 1973). While attitudes deal with the evaluation of specific entities, and goals involve movements towards such entities, values describe more abstract, trans-situational guides to what is important in one's environment (Rohan, 2000).

Research into the structure of human values suggests that they can be broken down into 10 universal domains (Schwartz, 1992), which in turn can be significant predictors of behavioural outcomes (Bardi & Schwartz, 2003). The 10 broad value domains include achievement, benevolence, conformity, hedonism, power, security, self-direction, stimulation, tradition, and universalism. Together, these 10 values are organized around the two higher-order value dimensions of self-enhancement vs. self-transcendence and openness to change vs. conservatism (Schwartz, 1992). The former dimension opposes the values of power and achievement with benevolence and universalism, while the latter dimension separates self-direction and stimulation from security, conformity, and tradition. Hedonism, finally, is related to both self-enhancement and openness to change. Although the structure of human value systems appears to be universal, the specific value priorities that are adopted will vary across individuals and different cultural contexts (Schwartz & Bardi, 2001).

Just as researchers have described the structure of human values, parallel developments in trait theory have produced the "Big Five" model of personality (Goldberg, 1993). This widely used framework describes personality as being comprising of five broad trait domains: Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness (McCrae & John, 1992). Extraversion describes the extent to which individuals are outgoing, talkative, and energetic; Agreeableness relates to one's levels of compassion, empathy, and concern for others; Conscientiousness includes traits such as responsibility, self-discipline, and orderliness; Neuroticism covers the extent to which an individual is anxious, irritable, and emotionally unstable; finally, Openness describes one's levels of imagination, creativity, and openness to ideas. These five trait domains appear to be cross-culturally valid (McCrae & Costa, 1997), are relatively stable across the lifespan (Costa et al., 1997), and can be used to predict a variety of real-world outcomes (Ozer & Benet-Martinez, 2006).

While the study of values has largely been separated from the study of personality traits, a growing literature suggests that there are important relationships between the two fields (classic examples of such links can be found in Eysenck, 1954 & Rokeach, 1973). In two recent studies, correlational analyses revealed that each of Schwartz' 10 value domains can be related to at least one of the Big Five personality traits (Oliver & Mooradian, 2003; Roccas, Sagiv, Schwartz, & Knafo, 2002). Although no causal inferences can be drawn from these studies, the authors suggest that individuals tend to adopt personal values that are compatible with their dispositional traits. While previous research has examined the relationship between the Big Five and Schwartz' broad value domains, the current study looks at how personality is related to the more specific values of Consumerism and Environmentalism.

### 1.1. Consumerism

Consumerism has been conceptualized as a value structure that emphasizes the importance of material possessions and the pursuit of personal wealth (Fournier & Richins, 1991). Although consumer values have often been examined at a cultural level (Mukerji, 1983; Campbell, 1987), psychologists have also studied how they operate on an individual level (e.g., Kasser & Kanner, 2004). People possessing high levels of this value tend to be more focused on the material needs of the self and pay less attention to communal goals (Burroughs & Rindfleisch, 2002). Associated with this lack of other-focus, materialist individuals also demonstrate lower levels of empathy, a lack of gratitude, and greater levels of relationship conflict (Belk, 1985; Kasser, Ryan, Couchman, & Sheldon, 2004; McCullough, Emmons, & Tsang, 2002).

Another distinct characteristic of materialistic values is that they appear to be negatively related to subjective well-being (Diener & Biswas-Diener, 2004; Kasser & Ahuvia, 2001; Kasser & Ryan, 1993). One interpretation of this finding is that materialistic individuals tend to be less satisfied with their current resources, always aspiring toward the accumulation of even greater wealth. It should be noted, however, that materialistic values are negatively related to life satisfaction across a number of domains, including satisfaction with friends, family, income, and fun (Richins & Dawson, 1992). Some authors suggest that this negative relationship with well-being results from the fundamental value conflicts that arise from having a predominantly self-focused worldview (Burroughs & Rindfleisch, 2002). Note, however, that the relationship between values and well-being may depend upon the congruence between one's personal values and those found in his or her environment (Sagiv & Schwartz, 2000). Within Schwartz' value framework, Consumerism falls within the higher-order group of self-enhancement values.

To date, no studies have situated Consumerism within the Big Five framework, but based upon the emphasis of material self-interest over communal goals and well-being, we expected that a negative relationship with Agreeableness would emerge. The negative relationship between materialist values and life satisfaction also suggests that there may be a positive relationship with Neuroticism.

### 1.2. Environmentalism

While self-interest and a lack of community focus are associated with consumer values, empathy and a concern for others appear to be associated with pro-environmental values. According to research into the structure of pro-environmental motivations, there are three distinct value-bases for environmental attitudes: egocentric, altruistic, and biospheric (Schultz, 2001). People with different value-bases have different reasons for being concerned about environmental degradation. Egocentric concerns relate to how environmental degradation may affect one's self, altruistic concerns relate to how much an individual cares about the well-being of others, and biospheric concerns are linked to caring about the integrity of nature itself. Both altruistic and biospheric concerns are positively correlated with measures of perspective taking and empathic concern, and are also better predictors of pro-environmental attitudes and behaviours than egocentric concerns. More support for the link between other-focused values and Environmentalism comes from a cross-cultural study spanning six countries, in which altruistic and biospheric concerns were positively correlated with the higher-order value domain of self-transcendence, but negatively correlated with self-enhancement (Schultz et al., 2005).

Interpretation of this empathy-environment relationship draws upon theories of altruism and the self-concept, which suggest that an expanded sense of self is more likely to produce helping behaviours towards others (Cialdini, Brown, Lewis, Luce, & Neuberg, 1997). One of the key consequences of empathy towards another is the incorporation of the other into the self. In other words, feeling empathy for another can be thought of as extending the boundaries of one's self-concept to include the other. This has been amply demonstrated in the domain of intimate relationships, where the experience of falling in love has been demonstrated to involve a cognitive merging of one's representation of self with one's representation of partner (e.g., Aron, Aron, Tudor, & Nelson, 1991). In a parallel line of reasoning, it has long been argued that the root of environmental problems is the human sense of disconnection from nature and, therefore, the most important step towards improving the relationship between humans and nature is the development of a sense of personal connection to the environment. This sense of environmental connectedness has been termed an ecological self-concept (e.g., Bragg, 1996). Previous research on the ecological self-concept has found that it is a better predictor of a wide array of pro-environmental motivations than existing measures of environmental concern (Mayer & Frantz, 2004). The suggestion is that caring and empathic values lead individuals to incorporate nature into the self, thus motivating more environmentally responsible values and behaviour. Some evidence for this comes from the fact that an emotional affinity towards nature is a powerful predictor of environmentally protective behaviours (Kals, Schumacher, & Montada, 1999), and that a simple perspective-taking manipulation is able to raise levels of biospheric environmental concerns (Schultz, 2000).

In terms of the Big Five personality constructs, we also expected Environmentalism to be related to Agreeableness, but in a positive direction. Because Agreeableness is associated with higher levels of empathy, it should be related to higher levels of pro-environmental values. The relationship between Environmentalism and a broader self-concept suggests that there may also be a positive correlation with Openness to Experience, which predicts a greater flexibility in the boundaries of one's identity (Tesch & Cameron, 1987).

## 2. Method

### 2.1. Participants

Participants in this study were 106 undergraduate students from The University of Toronto (74 female) ranging in age from 17 to 45 ( $M = 21$ ,  $SD = 3.4$ ). Participants were recruited through campus flyers advertising the experiment and were paid \$10 for their time.

### 2.2. Materials

New Ecological Paradigm (NEP): The NEP measures the extent to which respondents are concerned about environmental issues (Dunlap, Van Liere, Mertig, & Jones, 2000). The scale contains 15 statements about the environment and participants must rate their agreement on a 7-point scale (1 = *strongly disagree*; 7 = *strongly agree*). Example items include “*Humans are severely abusing the natural environment*”, and “*The balance of nature is very delicate and easily upset*”.

The scale is a revised version of the original NEP scale (Dunlap & Van Liere, 1978), which has been validated extensively in the study of environmental attitudes.

**Ecological Self Scale:** Participants' sense of personal connection to the environment, or ecological self, was measured using the Ecological Self Scale (Dolderman, 2004). This scale contains 26 items reflecting the extent to which one feels personally connected to the natural environment, or that the natural environment is a part of one's self-concept. Example items include “*I am part of nature*”, and “*I feel very connected to nature*”. Responses were made on a 9-point scale (1 = *does not describe me at all*; 9 = *completely describes me*). This scale has been found to be a valid predictor of environmental attitudes and behaviour, much like other scales measuring similar constructs (e.g., Mayer & Frantz, 2004; Schultz, Shriver, Tabanico, & Khazian, 2004).

**Consumer Values Orientation Scale:** The Consumer Values Orientation scale (Richins & Dawson, 1992) was used to measure the extent to which participants value material possessions and the accumulation of wealth. Example items include “*Buying things gives me a lot of pleasure*” and “*I like to own things that impress people*”. Responses were made on a 7-point scale (1 = *strongly disagree*; 7 = *strongly agree*). This scale demonstrates good test–retest reliability, and is a valid predictor of consumerist attitudes and behaviours.

**Behavioural Goals:** We provided participants with a list of 40 goals, a subset of which were related either to Consumerism or pro-environmental behaviours. Participants rated the extent to which they intended to pursue each goal on a 9-point scale (1 = *strongly disagree*; 9 = *strongly agree*). Example consumer goals include “*I plan to make lots of money*”, and “*I plan to spend more time shopping*”. Example pro-environmental items include “*I plan to spend more time learning about how I can help the environment*”, and “*I plan to write to my political representative about environmental issues*”. Self-reported behavioural intentions such as these are one of the most valid predictors of subsequent behaviour (e.g., Kaiser, Wolfing, & Fuhrer, 1999; Stern, Dietz, & Guagnano, 1995).

**Big Five Inventory (BFI):** The Big Five personality traits were measured with the Big Five Inventory (John & Srivastava, 1999), a reliable and widely used measure of the five factors. The BFI contains 44 items spread across the five dimensions. Participants rate the extent to which they can be described by the items on a 5-point scale (1 = *strongly disagree*; 5 = *strongly agree*). Sample items include “*Is helpful and unselfish with others*”, and “*Is a reliable worker*”.

### 2.3. Procedure

After consenting to participate in the study, participants completed a questionnaire package containing the measures listed above. The ordering of the scales was randomized for each participant to minimize any order effects. Upon completing the study, participants were given \$10 and fully debriefed.

## 3. Results

### 3.1. Extracting Environmentalism and Consumerism components

The scales used in the study demonstrated internal consistency, with Cronbach's  $\alpha$  ranging from .83 to .95 (See Table 1). In order to extract a single Environmentalism variable, we performed an

unrotated principal component analysis on responses from the NEP, Ecological Self Scale, and Pro-Environmental behavioural goals. The initial component accounted for 65% of the total variance of the scales, and was used as our aggregate measure of Environmentalism. Similarly, in order to extract a single Consumerism variable, we conducted another unrotated principal component analysis on the Consumer Values Orientation Scale and the Consumerist behavioural goals. The initial component to emerge from this analysis accounted for 71% of the total variance, and was used as our measure of Consumerism. Descriptive statistics and component loadings for the original scales are presented in Table 1. Note that we are taking a latent variable approach in which Environmentalism is here defined as the set of values, goals and beliefs that result in pro-environmental behaviours. Similarly, Consumerism is here defined as the set of values, goals and beliefs that emphasize the relative importance of material goods over other domains of life.

### 3.2. Gender differences in Consumerism and Environmentalism

Due to the limited number of males in our sample, we combined both males and females into a single group for our analyses. A one-way ANOVA demonstrated that there were no significant gender differences in our composite measures of Consumerism,  $F(1, 104) = 1.08$ ,  $p = .301$ , or Environmentalism,  $F(1, 104) = 1.22$ ,  $p = .273$ . The only measure of these constructs that did produce gender differences was the NEP, with males scoring lower ( $M = 12.91$ ) than females ( $M = 18.92$ ),  $F(1, 104) = 4.48$ ,  $p = .037$ .

### 3.3. Personality–Consumerism relationships

Raw correlations between the Big Five personality traits and the Consumerism component revealed a significant negative association with Agreeableness ( $r = -.27$ ). This relationship remained stable when age and gender were controlled for in a partial correlation ( $r = -.26$ ). No other personality trait neared significance. The full correlation matrix is displayed in Table 2. A linear regression including all five traits confirmed that only Agreeableness was a significant predictor of Consumerism,  $\beta = -.26$ ,  $t(100) = -2.51$ ,  $p = .014$ , with all other traits having  $p > .65$ .

Table 1  
Descriptive statistics, reliabilities, and component loadings for measures of Consumerism and Environmentalism

Scales	<i>M</i>	<i>SD</i>	$\alpha$	C loadings	E loadings
<i>Consumerism</i>					
Consumer goals	5.38	1.67	.83	.843	
CVOS	4.10	0.95	.87	.843	
<i>Environmentalism</i>					
Ecological self	4.67	1.63	.95		.867
Environmental goals	4.49	1.47	.94		.876
NEP	5.14	0.91	.85		.664

C loadings = component loadings for first unrotated Consumerism principal component. E loadings = component loadings for first unrotated Environmentalism principal component.



### 3.4. Personality–Environmentalism relationships

The Environmentalism component demonstrated significant positive relationships with both Agreeableness ( $r = .33$ ) and Openness ( $r = .24$ ), with no other associations nearing significance. Controlling for age and gender again had no influence on the relationship between Environmentalism and Agreeableness ( $r = .32$ ) or the association with Openness, which remained the same ( $r = .23$ ). Table 2 displays the full pattern of intercorrelations.

A linear regression demonstrated that Environmentalism was independently predicted by both Agreeableness ( $\beta = .34$ ,  $t(103) = 3.81$ ,  $p < .001$ ) and Openness ( $\beta = .26$ ,  $t(103) = 2.87$ ,  $p < .01$ ). Taken together, the two personality variables accounted for a significant portion of the total variance ( $R^2 = .17$ ,  $F(2, 103) = 10.78$ ,  $p < .001$ ). None of Extraversion, Conscientiousness, or Neuroticism reached significance in a model including all five factors as predictor variables.

When looking at the specific measures of Environmentalism, Neuroticism had a significant zero-order correlation with the Ecological Self questionnaire,  $r = -.20$ ,  $p < .05$ . This is most likely due to the shared variance with other traits, however, because the relationship was no longer significant when Neuroticism was entered into a regression with Agreeableness and Openness as predictors,  $\beta = -.08$ ,  $t(102) = -0.88$ ,  $p = .38$ .

On its own, the NEP showed no significant correlations with any of the personality traits, although there was a trend towards significance for Agreeableness,  $r = .17$ ,  $p = .09$ , two-tailed.

## 4. Discussion

The Big Five personality traits emerged as significant predictors of both Consumerism and Environmentalism. Specifically, Agreeableness negatively predicted Consumerism, while both Agreeableness and Openness positively predicted Environmentalism. These findings can be interpreted as specific instances of the higher-order trait-value relationships found in the literature. In particular, Agreeableness and Openness are positively associated with the higher-order value of

Table 2  
Correlations between Personality, Consumerism, and Environmentalism

Variables	E	A	C	N	O
Consumerism	.03	-.27**	-.09	.05	.05
Goals Con	.04	-.15	.01	-.03	.17
CVOS	.00	-.30**	-.16	.11	-.09
Environmentalism	.04	.33**	-.04	-.13	.24*
Goals Env	.09	.31**	.08	-.09	.23*
EcoSelf	.06	.30**	-.08	-.20*	.30**
NEP	-.08	.17	-.11	.01	.02

E = Extraversion, A = Agreeableness, C = Conscientiousness, N = Neuroticism, O = Openness, Goals Con = Consumer Goals, CVOS = Consumer Values Orientation Scale, Goals Env = Environmental Goals, EcoSelf = Ecological Self Scale, NEP = New Ecological Paradigm.

\*  $p < .05$ , two-tailed.

\*\*  $p < .01$ , two-tailed.

self-transcendence, and negatively related to the higher-order value of self-enhancement (Oliver & Mooradian, 2003; Roccas et al., 2002).

The negative relationship between agreeableness and self-enhancement is supported by studies demonstrating that less agreeable people tend to be more self-focused in numerous life domains (Graziano & Eisenberg, 1997). Some researchers have suggested that this increased self-focus may develop from feelings of scarcity or insecurity during childhood (Inglehart, 1990; Kestebaum, Farber, & Sroufe, 1989; Shaver & Brennan, 1992). It appears that one way that this self-focus manifests itself is as an increased concern for material self-interest and the accumulation of wealth.

On the other end of the spectrum, a high level of Agreeableness is one of the best personality predictors of empathic concern (Ashton, Paunonen, Helmes, & Jackson, 1998). Individuals with high levels of this trait are more likely to be warm, caring, and altruistic, potentially due to the greater degree of overlap between their representations of self and other (Cialdini et al., 1997). Our study has demonstrated that these people are also more likely to display higher levels of Environmentalism, as predicted by recent theories of pro-environmental motivations (Schultz, 2000).

An interesting finding from our study is that both Agreeableness and Openness predict unique aspects of the total variance in Environmentalism. This suggests that the contributions of Openness may be distinct from the empathy-related contributions of Agreeableness. One interpretation of this finding is based on the role of aesthetic experience in shaping pro-environmental values (Kellert, 1997). The aesthetic sensibilities of individuals with high levels of Openness may help to enhance their experience of nature, thereby increasing their personal valuation of the natural environment. Support for this notion comes from studies demonstrating that one's experience of the natural world is a strong predictor of subsequent environmental attitudes and behaviours (Finger, 1994; Kaplan & Kaplan, 1989).

The pattern of correlations obtained with the specific measures of Environmentalism (see Table 2) suggests that personality factors are most effective at predicting specific pro-environmental goals and the extent to which nature is included in one's self-concept. The NEP, which is a common measure of environmental concern, did not demonstrate any significant personality correlates (although there was a trend in the expected direction with Agreeableness). This reduced correlation may be due to the association of this measure with the more cognitive aspects of Environmentalism, such as an awareness of potentially hazardous environmental consequences (Stern et al., 1995). Such a view is consistent with our interpretation that it is primarily the empathy-related elements of Environmentalism that are being predicted by the Big Five personality traits. It is also worth noting that specific behavioural intentions and the inclusion of nature in the self are better predictors of pro-environmental behaviour than is environmental concern (Kaiser et al., 1999; Schultz, 2001).

Although the obtained results are promising, a number of limitations to the study could be improved upon in future research. First of all, our relatively small sample prevented us from looking at demographic variables such as socioeconomic status and cultural background. We also had a larger proportion of females in our sample, although no significant gender differences were found in our extracted Environmentalism and Consumerism measures. A larger sample would allow for a more detailed examination of how gender, socioeconomic status, and cultural background may interact with personality in predicting the variables of interest. Second, our reliance on self-report measures prevented us from assessing how personality traits may influence behaviour in the real



world. Subsequent studies would benefit from employing objective measures of consumer and environmental behaviours, in addition to the self-report questionnaires. Finally, the use of a correlational design prevents us from drawing any conclusions about causality. A more detailed analysis of the processes involved and their development over time would clarify the nature of the observed relationships.

Overall, the current findings emphasize the importance of personality in predicting Environmentalism and Consumerism. While social and structural factors undoubtedly influence both of these domains (e.g., Dietz et al., 1998; Kasser et al., 2004), examining the contributions of individual personality traits also appears to be a fruitful approach. Future research into these areas would benefit from combining social, structural, and personality approaches in order to maximize our predictive ability and further our knowledge in these domains.

## Acknowledgement

We would like to thank Sonia Kang for her helpful comments on an earlier draft of this paper.

## References

- Aron, A., Aron, E. N., Tudor, M., & Nelson, G. (1991). Close relationships as including other in the self. *Journal of Personality and Social Psychology*, *60*, 241–253.
- Ashton, M. C., Paunonen, S. V., Helmes, E., & Jackson, D. N. (1998). Kin altruism, reciprocal altruism, and the Big Five personality factors. *Evolution and Human Behavior*, *19*, 243–255.
- Bamberg, S. (2003). How does environmental concern influence specific environmentally related behaviors? A new answer to an old question. *Journal of Environmental Psychology*, *23*, 21–32.
- Bardi, A., & Schwartz, S. H. (2003). Values and behavior: Strength and structure of relations. *Personality and Social Psychology Bulletin*, *29*, 1207–1220.
- Belk, R. W. (1985). Materialism: Trait aspects of living in a material world. *Journal of Consumer Research*, *12*, 265–280.
- Bragg, E. A. (1996). Towards ecological self: Deep ecology meets constructionist self-theory. *Journal of Environmental Psychology*, *16*, 93–108.
- Burroughs, J. E., & Rindfleisch, A. (2002). Materialism and well-being: A conflicting values perspective. *Journal of Consumer Research*, *29*, 348–370.
- Campbell, C. (1987). *The Romantic ethic and the spirit of modern consumerism*. New York: Basil Blackwell.
- Cialdini, R. B., Brown, S. L., Lewis, B. P., Luce, C., & Neuberg, S. L. (1997). Reinterpreting the empathy–altruism relationship: When one into one equals oneness. *Journal of Personality and Social Psychology*, *73*, 481–494.
- Costa, P. T., Jr., & McCrae, R. R. (1997). Longitudinal stability of adult personality. In R. Hogan, J. A. Johnson, & S. R. Briggs (Eds.), *Handbook of personality psychology* (pp. 269–290). San Diego: Academic Press.
- Diener, E., & Biswas-Diener, R. (2004). Will money increase subjective well-being? *Social Indicators Research*, *57*, 119–169.
- Dietz, T., Fitzgerald, A., & Shwom, R. (2005). Environmental values. *Annual Review of Environment and Resources*, *30*, 335–372.
- Dietz, T., Stern, P. C., & Guagnano, G. A. (1998). Social structural and social psychological bases of environmental concern. *Environment and Behavior*, *30*, 450–471.
- Dolderman, D. (2004). *The Ecological Self Scale*. Unpublished Manuscript.
- Dunlap, R. E., & Van Liere, K. D. (1978). The “new environmental paradigm”: A proposed measuring instrument and preliminary results. *Journal of Environmental Education*, *9*, 10–19.

- Dunlap, R. E., Van Liere, K. D., Mertig, A. G., & Jones, R. E. (2000). Measuring endorsement of the new ecological paradigm: A revised NEP scale. *Journal of Social Issues, 56*, 425–442.
- Eysenck, H. J. (1954). *The psychology of politics*. London: Percy Lund, Humphries & Co. Ltd.
- Finger, M. (1994). From knowledge to action? Exploring the relationships between environmental experiences, learning, and behaviour. *Journal of Social Issues, 50*, 141–160.
- Fournier, S., & Richins, M. L. (1991). Some theoretical and popular notions concerning materialism. *Journal of Social Behavior and Personality, 6*, 403–414.
- Goldberg, L. R. (1993). The structure of phenotypic personality traits. *American Psychologist, 48*, 26–34.
- Graziano, W. G., & Eisenberg, N. (1997). Agreeableness: A dimension of personality. In R. Hogan, J. Johnson, & S. Briggs (Eds.), *Handbook of personality psychology* (pp. 795–824). New York: Academic Press.
- Inglehart, Ronald. (1990). *Culture shift in advanced industrial society*. Princeton, NJ: Princeton University Press.
- John, O. P., & Srivastava, S. (1999). The Big Five trait taxonomy: History, measurement, and theoretical perspectives. In L. A. Pervin & O. P. John (Eds.), *Handbook of personality: theory and research* (2nd ed., pp. 102–138). New York: Guilford.
- Kaiser, F. G., Wolfing, S., & Fuhrer, U. (1999). Environmental attitude and ecological behaviour. *Journal of Environmental Psychology, 19*, 1–19.
- Kals, E., Schumacher, D., & Montada, L. (1999). Emotional affinity toward nature as a motivational basis to protect nature. *Environment and Behavior, 31*, 178–202.
- Kaplan, R., & Kaplan, S. (1989). *The experience of nature: a psychological perspective*. New York: Cambridge University Press.
- Kasser, T., & Ahuvia, A. (2001). Materialistic values and well-being in business students. *European Journal of Social Psychology, 32*, 137–146.
- Kasser, T., & Kanner, A. D. (Eds.). (2004). *Psychology and consumer culture: The struggle for a good life in a materialistic world*. Washington, DC: American Psychological Association.
- Kasser, T., & Ryan, R. M. (1993). A dark side of the American dream: Correlates of financial success as a central life aspiration. *Journal of Personality and Social Psychology, 65*, 410–422.
- Kasser, T., Ryan, R. M., Couchman, C. E., & Sheldon, K. M. (2004). Materialistic values: Their causes and consequences. In T. Kasser & A. D. Kanner (Eds.), *Psychology and consumer culture: The struggle for a good life in a materialistic world* (pp. 11–28). Washington, DC: American Psychological Association.
- Kellert, S. J. (1997). *Kinship to mastery: Biophilia in human evolution and development*. Washington, DC: Island Press.
- Kestenbaum, R., Farber, E. A., & Sroufe, L. A. (1989). Individual differences in empathy among preschoolers: Relation to attachment history. In *New directions for child development*. In N. Eisenberg (Ed.), *Empathy and related emotional responses* (vol. 44, pp. 51–64). San Francisco: Jossey-Bass.
- Mayer, F. S., & Frantz, C. M. (2004). The connectedness to nature scale: A measure of individuals' feeling in community with nature. *Journal of Environmental Psychology, 503–515*.
- McCrae, R. R., & Costa, P. T. Jr., (1997). Personality trait structure as a human universal. *American Psychologist, 52*, 509–516.
- McCrae, R. R., & John, O. P. (1992). An introduction to the five-factor model and its applications. *Journal of Personality, 60*, 175–215.
- McCullough, M. E., Emmons, R. A., & Tsang, J.-A. (2002). The grateful disposition: A conceptual and empirical topography. *Journal of Personality and Social Psychology, 82*, 112–127.
- Mukerji, C. (1983). *From Graven Images: Patterns of Modern Materialism*. New York: Columbia University Press.
- Oliver, J. M., & Mooradian, T. A. (2003). Personality traits and personal values: A conceptual and empirical investigation. *Personality and Individual Differences, 35*, 109–125.
- Ozer, D. J., & Benet-Martinez, V. (2006). Personality and the prediction of consequential outcomes. *Annual Review of Psychology, 57*, 401–421.
- Richins, M. L., & Dawson, S. (1992). A consumer values orientation scale for materialism and its measurement: Scale development and validation. *Journal of Consumer Research, 19*, 303–316.
- Roccas, S., Sagiv, L., Schwartz, S. H., & Knafo, A. (2002). The Big Five Personality Factors and Personal Values. *Personality and Social Psychology Bulletin, 28*, 789–801.
- Rohan, M. J. (2000). A rose by any name? The values construct. *Personality and Social Psychology Review, 4*, 255–277.

- Rokeach, M. (1973). *The nature of human values*. New York: Free Press.
- Sagiv, L., & Schwartz, S. H. (2000). Value priorities and subjective well-being: Direct relations and congruity effects. *European Journal of Social Psychology*, *30*, 177–198.
- Schultz, P. W. (2000). Empathizing with nature: The effects of perspective taking on concern for environmental issues. *Journal of Social Issues*, *56*, 391–406.
- Schultz, P. W. (2001). The structure of environmental concern: Concern for self, other people, and the biosphere. *Journal of Environmental Psychology*, *21*, 327–339.
- Schultz, P. W., Gouveia, V. Y., Cameron, L. D., Tankha, G., Schmuck, P., & Franek, M. (2005). Values and their relationship to environmental concern and conservation behaviour. *Journal of Cross-Cultural Psychology*, *36*, 457–475.
- Schultz, P. W., Shriver, C., Tabanico, J. J., & Khazian, A. M. (2004). Implicit connections with nature. *Journal of Environmental Psychology*, *24*, 31–42.
- Schwartz, S. H. (1992). Universals in the content and structure of values. In M. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 25, pp. 1–65). New York: Academic Press.
- Schwartz, S. H., & Bardi, A. (2001). Value hierarchies across cultures: Taking a similarities approach. *Journal of Cross-Cultural Psychology*, *32*, 268–290.
- Shaver, P. R., & Brennan, K. A. (1992). Attachment styles and the “Big Five” personality traits: Their connections with each other and with romantic relationship outcomes. *Personality and Social Psychology Bulletin*, *18*, 536–545.
- Stern, P. C., Dietz, T., & Guagnano, G. A. (1995). The new ecological paradigm in social-psychological context. *Environment and Behavior*, *27*, 723–743.
- Tesch, S. A., & Cameron, K. A. (1987). Openness to experience and development of adult identity. *Journal of Personality*, *55*, 615–630.