

Anthropocentrism, Value Systems, and Environmental Attitudes: A Multi-National Comparison (1997)

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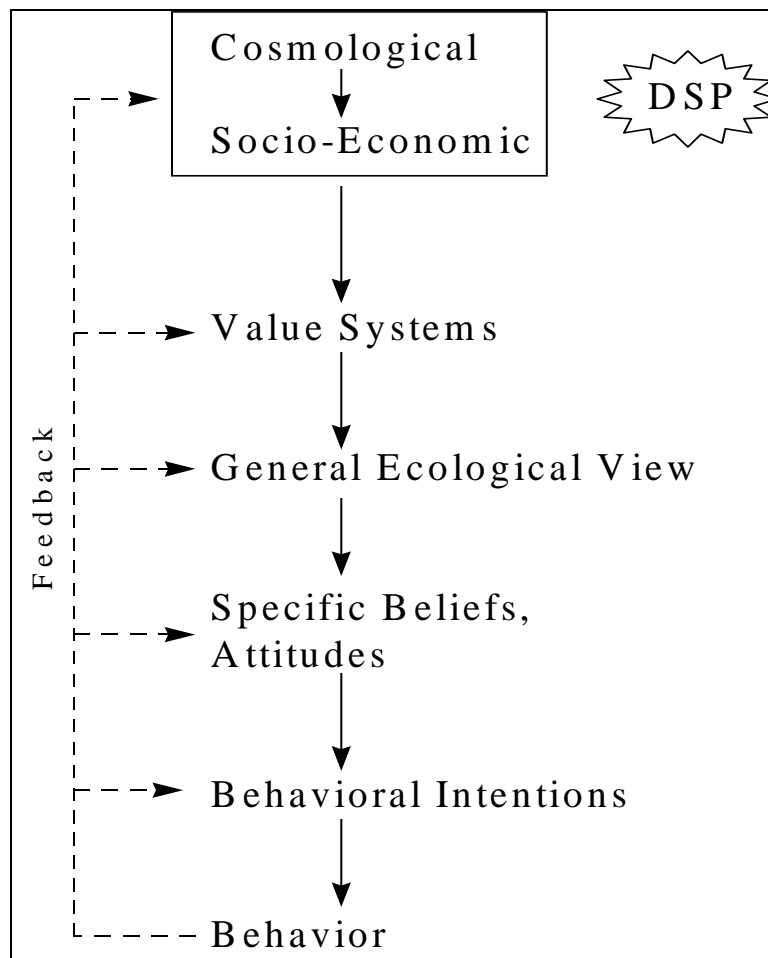
1. Introduction

Environmental concern has been considered the necessary prerequisite for global sustainable both explicitly and implicitly. While high levels of environmental concern appear to have developed over the past twenty years, environmental degradation still advances at relatively high rates because individuals who express concern seldom engage in environmentally responsible behaviors (Maloney and Ward 1973; Scott and Willits 1994). While it is true that such changes as those deemed necessary for sustainability can be brought about only slowly, the gap between attitudes and behavior in the environmental arena are alarming to many. Attempts to clarify and explain this gap have been slow in developing but are now beginning to appear in the environmental literature. Many of these relate, however, to the development of measurement instruments and the criticism of construct development (Stern, Dietz and Guagnano 1995) stemming from the conflicting results that have been found. In fact, contradictory results have been found in the relative impacts of socio-demographic, attitudinal, and concern on behavioral intention and behavioral measures.

Stern, Dietz and Guagnano 1995 suggest that this is because of the failure to develop a satisfactory causal model of environmental concern. In proposing such a model, they argue that the causal sequence begins at the institutional level of society and proceeds successively to value systems, general environmental beliefs, specific environmental beliefs, behavioral intentions, and behavior. The model is presented in Figure 1 below. This approach is taken in the present study which proposes to examine the relationship between the top three levels of the model. Most environmental research in marketing has examined the lower three levels of the model and only recently have the

value and institutional levels been examined. While Stern, Dietz, and Guagnano (1995) and Grunert and Juhl (1995) have examined the values level of the model, Grunert-Beckmann and Kilbourne (1997) and Kilbourne, McDonagh, and Prothero (1997) have begun the examination of the institutional level, or the dominant social paradigm (DSP), of contemporary Western industrial societies. We will now briefly examine the conceptual models used at these two levels.

Figure 1
Causal Model of Environmental Concern



Adapted from Stern, Dietz, and Guagnano (1995)

2. Dominant Social Paradigm

The DSP defines the cultural context within which society's members construct their world view. Milbrath (1984) has defined the DSP as "... the values, metaphysical beliefs, institutions, habits, etc. that collectively provide social lenses through which individuals and groups interpret their social world" (p. 7). As such, it is instrumental in

individuals' basic beliefs about their place in the cosmos, their perception of their own actions, and their beliefs about such basic institutionally derived constructs as justice and progress. It is precisely these constructs and beliefs that are instrumental in the development of sustainable societies and within which present conflicts, both intrapersonal and international, can be framed.

It is argued by van Dam and Apeldoorn (1996) that progress toward sustainability requires a reassessment of the relationship between micro-marketing objectives and macromarketing goals. Because of the interplay between state, business, and science in postindustrial societies (Beck 1995), or what we refer to here as politics, economics and technology, there is an inherent drive toward unsustainability (van Dam and Apeldoorn 1996). To understand this seemingly intractable drive, it is necessary to examine the root causes that engender it. This entails a thorough examination of the higher levels of the model used here. While Grunert-Beckmann and Kilbourne (1997) examined the socio-economic domain of the DSP and its relationship to value systems, there is second domain complicit in the development and interplay of value systems. This is the cosmological domain that entails the highest level of the DSP and includes three separate dimensions through which individuals define and operationalize their view of the world. These are human position in nature (anthropocentric-ecocentric), construction of nature (atomism-holism), and the functioning of nature (cooperative-competitive). These dimensions have received scant attention within the environmental literature to date. Here, we will examine only the anthropocentric-ecocentric dimension and its relationship to value systems and environmental concern because of space limitations.

2.1 Anthropocentric beliefs

The essential feature of the anthropocentric dimension of the cosmological domain is the belief that humans are separate from and ethically superior to the rest of nature. As a result, humans consider themselves to be rightfully, the masters of nature subduing it for their own instrumental purposes. With the demystification of nature (Lewis 1973), through scientific and technological development, its manipulation and exploitation were assured and resulted in "the death of nature" (Merchant 1980). The antipodal position to anthropocentrism is ecocentrism which considers nature to have inherent value regardless of its usefulness to humans (Shrivastava 1995; Purser, Park, and Montuori 1995; Thompson and Barton 1994).

There are two perspectives from which to examine the ecocentric position. The first is the position that the objective is "*human* emancipation and fulfillment in an ecologically sustainable society (Eckersley 1992, p. 26)." This position has been described as human welfare ecology (Kilbourne 1995; O'Riordan 1976). The second acknowledges the same objective but with a recognition of the moral standing of nonhuman world and its rights to continue evolving. The primary point of departure between the two views is the position of humans in the biosphere.

Within the ecocentric view, there is no basis for assuming that humans represent the paragon of evolution with rights superseding or negating those of other life forms which are considered to have inherent value in their own right. Ecocentric theorists postulate that the current ecological crisis stems from this over inflated sense of value, or,

as Ehrenfeld (1978) calls it, the “arrogance of humanism.” It is argued by O’Riordan (1976) that even the weaker forms of anthropocentrism such as conservationism and human welfare ecology are not sustainable since, in the presence of human crisis, they would be sacrificed for the more humanist perspectives. Kilbourne (1995) postulates five different environmental positions that vary by their position on a continuum from anthropocentrism to ecocentrism. These are, from the most anthropocentric to the most ecocentric, environmentalism, conservationism, human welfare, preservationism, and ecologism.

Thompson and Barton (1994) examined the effect of anthropocentric and ecocentric beliefs on attitudes toward the environment and concluded, albeit weakly, that ecocentric beliefs affected environmental attitudes as measured by three scales constructed for the study, conservation behaviors, self-reported actions, and environmental apathy. However, they defined the anthropocentrism and ecocentrism as two different constructs rather than opposite ends of a continuum as would have been more consistent with the literature. This leads to the intuitively inadequate reflection that one might be an anthropocentric ecocentric since the two constructs are defined as independent of each other. It might also lead to measurement difficulties if the content of one scale is contained within the other. This would help to account for their weak and somewhat conflicting result suggesting that anthropocentrism has no effect but ecocentrism does. In the current study, we are taking the approach tied more directly to the conceptual literature which places the two constructs as antipodal rather than independent.

Consistent with Stern, Dietz, and Guagnano (1995), we conjecture here that the anthropocentric position that occupies the institutional level of the model, leads to certain values that serve to maintain the *status quo* that is motivated by the DSP. Among these are the beliefs that humans are superior to nature, reasoning ability distinguishes humans from “lower” species, and property rights are more important than species rights (Kilbourne 1995). To tie the two levels of the model together, we will examine the relationship between anthropocentric beliefs and value systems directly through the use of the Schwartz Value Inventory (SVI). We will then examine the relationship between values and general environmental beliefs.

2.2 Value systems

Accordingly, values are those patterns by which individuals orient themselves in and adapt to their environment. These patterns were described by Tolman (1951) as basic conceptions about life which underlie an individual's behaviour. Values are both self-centered and social-centered in the sense that they form the point of intersection between individual and society. As general orientation standards, they include external, social-centered aspects insofar as they are effective as guiding principles established by the social environment. But they also include internal, self-centered aspects as standards internalized and accepted by the individual. Elsewhere (Grunert, K.G. Grunert, & Kristensen, 1994) we have argued that values are abstract mental constructs. They are assumed to be related indirectly to behaviour, i. .e., mediated by more concrete, mental constructs such as beliefs and attitudes (Grunert & Juhl, 1995; Homer & Kahle, 1988;

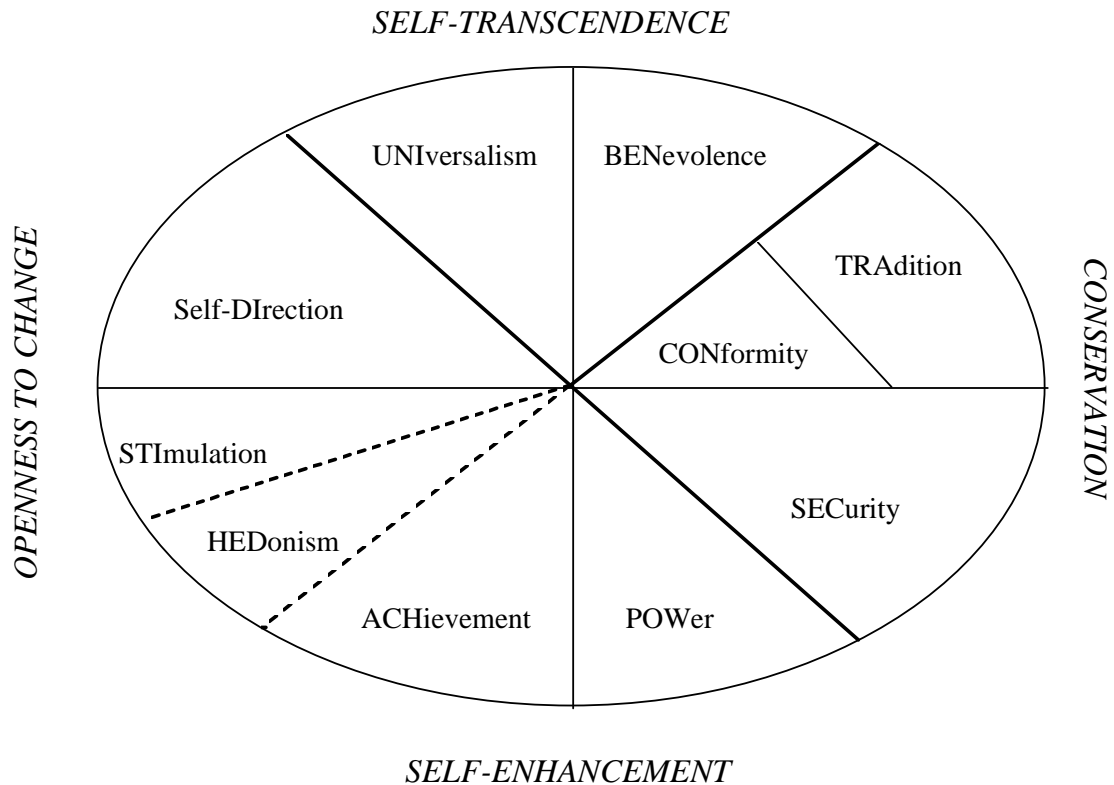
Lastovicka, 1991; Schuermann, 1988; Vinson, Scott & Lamont, 1977). Since values serve as frame of reference for evaluating situations, other persons and the self in order to guide actions, they embody emotions as well. In other words, as a behaviour-motivating force, they obviously present cognitive-emotive categories. These categories constitute a given cultural context. When culture is meant to refer to shared meanings, we could therefore, from a cognitive-emotive perspective, define it as collectively shared cognitive-emotive structures. The more a set of cognitive-emotive categories is shared by a group of people, and the more the associations between them are alike, the more can this set of cognitive-emotive categories be said to be part of their common culture. Likewise, the more such a set of cognitive-emotive categories and their interrelationships differ between two or more groups of people, the more we can say that they are culturally different.

Differences in peoples' values are then differences in peoples' collectively shared cognitive-emotive structures. Values are therefore defined as cognitive-emotive categories of an abstract nature with a strong evaluative component. The way in which peoples' behaviour is influenced by their value systems - that is, the overall structure into which values are ordered by their importance as guiding principles for daily life - may be interpreted by the way in which less abstract cognitive-emotive categories, e.g., actionable objects in their environment, are associated with more abstract, motivating cognitive-emotive categories in their cognitive-emotive structure. The meaningful content of values can be described as cognitive-emotive representations of three types of universal human requirements: Biologically based needs of the organism, social interactional claims for interpersonal coordination, and social institutional demands for group welfare and survival (cf., Kluckhohn, 1951; Maslow, 1959; Rokeach, 1973). Hence, value systems serve both individualistic and collectivist interests as well as a mixture of these (cf., Hofstede & Bond, 1984; Triandis, 1985). As such, they bear a close relation to the DSP since they specify how the cultural context is perceived, evaluated, and internalized in order to justify individual actions. The position taken here regarding the relationship between the DSP and VS is that, while the DSP is prior to values (Stern, Dietz, and Guagnano 1995), they exist in a reflexive relationship through which values are both derived from and inform the DSP.

2.3 The crossroads of society's norms and individual behaviour

As argued above, it is suggested that the cultural context as reflected in the DSP provides a blueprint for the development of individual VS. Since values represent motivations, or criteria used by individuals to select and justify actions, they are supposed to differ in their structural relations to each other as well as in the importance attached to them. Figure 2 illustrates how the ten motivational domains of values, as postulated by the theory of Schwartz (1992), are related to each other, and the four higher-order dimensions into which they can be grouped. Adjacent value types are most compatible, whereas an increasing distance around the circular order indicates a decreasing compatibility, and therefore, an increasing conflict. Value types that emerge in opposing directions from the origin should be in greatest conflict (for more details on the content of the ten motivational domains see the Appendix 1).

Figure 2 - Schwartz Value Inventory



It is the content universe of each motivational domain that determines the nature of the relationship between values and other constructs rather than a single value which belongs to a certain motivational domain. Conceiving an individual's value system as an integrated structure of motivational goals, i.e., specifying the association of one value type with an external variable, such as attitudes or behaviour, has then implications for the associations of this variable with the other value types as well. Hence, assessing VS by this approach will allow the identification of the DSP's influence on anthropocentric beliefs and environmental concern.

3. Methodology

3.1 Hypotheses

Based on the forgoing assessment, the following hypotheses were developed for testing.

H1: As individuals' anthropocentric beliefs (ANTH) increase, their self-transcendence (TRAN) value will decrease while their self-enhancement value (EGO) and conservationism value (CON) will increase. Openness values (OPEN) will be unaffected.

H2: As individuals' scores on TRAN increase their perception of ecological problems and measures of concern will increase. As their scores on EGO and CON increase, their measures of ecological problems and concern will decrease.

H3: As individuals' perception of ecological problems and concern increase, their willingness to trade off consumption and economy for environmental reasons will increase as will their perception of the requisite social change needed for environmental balance.

H4: Countries will differ on measures of concern and action, and the differences will be in accordance with the hypotheses in 1, 2, and 3.

3.1 Sample

The sample for the present study consisted of 264 university students from three countries. There were 57 from Spain, 70 from The Netherlands, and 137 from Denmark. All respondents were selected on a convenience basis and were neither required to participate in the study nor paid to participate if they chose. Danish students were predominantly marketing majors, Dutch students were from the marketing area of an agricultural university, and the Spanish students were from a Sociology department. Thus there was a fairly wide spectrum of students used in the study. It is recognized by the researchers that there is a potential confounding of country with student type, but the diversity of type reflects a diversity of attitudes which was deemed necessary for the study. It was not "countryness" that was of interest, but variation in beliefs and values, and the diversity of attitudes provides this variation. Thus variations in results by country should not be interpreted as country differences *per se*, but DSP and VS differences between countries leading to different environmental beliefs.

3.3 Questionnaire design

The questionnaire consisted of five sections, each with different types of questions. The first section contained the Schwartz Value Inventory SVI (Schwartz, 1992), in which respondents are asked to rate the importance of 57 values, belonging to the various motivational domains, as "a guiding principle in my life," using the following nine-point scale: 7 = of supreme importance, 6 = very important, 5, 4 (unlabelled), 3 = important, 2, 1 (unlabelled), 0 = not important, and -1 = opposed to my values. These 57 values are presented with brief explanations of their meanings in parentheses, e.g., "equality (equal opportunities for all)" and "ambitious (hard-working, aspiring)." In order to minimize shifts in scale use, an anchoring technique was employed by requesting that respondents first determine the value of utmost importance to them, then the one whose importance is virtually non-existent, and finally that they rate the remaining values.

The second section, with 30 seven point Likert type items, was used to assess the respondent's position on the DSP. There were six sets of five questions with the first three sets designed to measure attitudes towards the political, technological, and economic dimensions. The remaining three sets were to measure anthropocentric, atomistic, and competitive beliefs respectively. The anthropocentrism scale was the only one used in the present study.

The third set of questions contained 15 items to measure attitudes about different ecological issues. These were derived from Milbrath (1984) and Cotgrove (1982). They reflect general ecological beliefs rather than specific instances of specific problems. The averages of the items making up these sets of scales were used as the numerical value in the study.

The fourth section contained 15 seven point semantic differential type items to provide global measures of attitudes toward relevant social and ecological variables. For this study, ecological concern, perceived environmental damage, and necessary social change were the only three used. Each of these was considered a separate variable and the actual score of the respondent was used. For DSP variables, a higher score indicates a greater belief in the DSP and for the ecological scores, a higher score indicates a greater belief in environmental problems.

The fifth section asked for a few demographic information, namely age, living status, gender, and type of place where the respondent had grown up.

4. Analyses and Results

4.1 Questionnaire refinement

Factor analysis was used to determine whether the various scales represented the dimensions intended. The results of the analysis indicated that the five items in the anthropocentrism scale formed a single dimension. The average of the five items was used as the measurement in the subsequent analyses. Cronbach's alpha for the scale was .70 and the scale could not be improved by removing any items.

Since the study was of a cross cultural nature, those items in the SVI that have been shown to be unstable across cultures were removed from the data set. The remaining variables were factor analyzed yielding the four dimensions reflected in the higher order domains, self-transcendence, self-enhancement, conservationism, and openness. Each of these dimensions was reduced by the factor analysis however. TRAN maintained seven items, EGO resulted in three items, CON resulted in three items, and OPEN had five items. As before, the means of the items in each scale were used for the remaining analyses. The alpha scores for each of the four scales were 0.80 for TRAN, 0.68 for EGO, 0.59 for CON, and 0.75 for OPEN.

The scale for the perception of ecological problems (ECO) was reduced to six items through the factor analysis. These related to general ecological problems the respondent thought might exist. The alpha coefficient for this scale was 0.81 and the mean of the items was used as the measurement. The remaining variables in the study were all unidimensional and required no further analysis.

4.2 Analysis

In the first stage of the analysis, simple regression was used to determine the relationship between ANTH and TRAN, EGO, CON, and OPEN, i.e., the relationship between the DSP and VS as suggested in hypothesis 1 above. The results of this analysis are presented in Table 1 below. As can be seen in the table, the hypotheses were

confirmed. The relationship between ANTH and TRAN is negative as hypothesized indicating that as the individuals' beliefs are more anthropocentric than ecocentric, their measure of self-transcendent values becomes more negative. There can also be seen the positive relationship between ANTH and EGO and CON with the latter being only marginally significant. There was no relationship between ANTH and OPEN as predicted.

Table 1
Relationship between DSP and VS

	TRAN	EGO	CON	OPEN
ANTH b-value	-0.39	0.31	0.13	-0.11
p-value	0.001	.001	0.09	0.13

In the second stage of the analysis, multiple regression was used to determine the influence of VS on environmental beliefs and concern. Three separate regressions were run, one with each of three dependent variables, perception of ecological problems (ECO), environmental concern (CONC), and perception of the degree of environmental damage (COND). For each of these dependent variables, TRAN, EGO, CON, and OPEN were the independent variables. The results of this analysis, presented in Table 2, substantially confirm the relationships in hypothesis 2.

Table 2
Regression Coefficients for Effect of VS on Environmental Measures

	TRAN	EGO	CON	OPEN	Adjusted R ²
ECO	0.33 ¹	-0.20 ¹	-0.07	0.09	0.28
CONC	0.46 ¹	-0.06	-0.12 ³	-0.14 ³	0.16
COND	0.39 ¹	-0.09 ²	0.11 ²	0.08	0.22

¹ p-value < .01; ² p-value < .05; ³ p-value < .08

In this stage of the analysis, most, but not all, of the relationships were confirmed. TRAN was significant at less than .01 for all three of the dependent variables. It can also be seen that the direction of the relationships were all positive as predicted. EGO was significant in two of the three dependent variables, ECO and COND, but not in the third. Again, the direction of the relationship was negative as predicted. CON was significant for COND and marginally significant for CONC, but not for ECO. Here the direction of the relationship was negative for CONC and positive for COND. Finally, OPEN was marginally significant in the negative direction for CONC which was not predicted in the hypotheses.

In the third stage of the analysis, regression was again used to determine the relationship between environmental measures and the individual's expressed willingness to reduce consumption (CONS) and trade off economic well-being for environmental well-being (TRAD). The third dependent variable was the amount of social change perceived to be necessary for ecological well-being to ensue (SOC). In this analysis,

perceptions of the environment were used as the independent variables. The results of this analysis, presented in Table 3, confirm the hypotheses as stated. In this case, all coefficients are in the predicted direction and all are significant at less than traditional levels except

Table 3
**Regression Coefficients for Effect of Environmental Measures
on Willingness to Change and Degree of Social Change**

	ECO	CONC	COND	Adjusted R ²
CONS	0.16 ¹	0.20	0.39	0.24
TRAD	0.24	0.22	0.39	0.37
SOC	0.39	0.12 ²	0.26	0.23

¹ p-value < .08; ² p-value < .06; All unnumbered coefficients are significant at p < .02

In the final stage of the analysis, differences between countries regarding respondents' willing to change and perceptions of necessary social change were examined. In this analysis, ANOVA was used to determine if differences between countries existed and Duncan's Multiple Range Test was used to determine which countries were different if differences existed. Table 4 presents the results of this analysis and includes only the variables that were significantly different between countries. Spanish respondents were significantly lower than the others on anthropocentrism and self-enhancement. At the same time, they were significantly higher on self-transcendence, belief in environmental problems, and perception that the condition of the environment is deteriorating. Finally, it can be seen that Spanish respondents were more willing to consume less in the future than the others and perceived that greater social change was necessary to achieve environmental well-being than did Danish respondents. Those from The Netherlands were intermediate on the latter variable.

Table 4
Country Differences

	ANTH	TRAN	EGO	ECO	COND	CONS	SOC
SPAIN	3.0a	5.2a	1.4a	6.1a	6.1a	5.9a	5.8a
DENMARK	3.1a	3.7b	2.3b	5.5b	5.5b	5.0b	5.2b
NETHERLANDS	3.5b	4.2c	2.2b	5.1c	5.5b	5.2b	5.4
P-VALUE	.001	.001	.001	.001	.003	.003	.018

Means with the same letter are not different from each other

5. Discussion

It has been argued here that the model presented by Stern, Dietz, and Guagnano (1995) represents a step in the right direction in the analysis of environmental attitudes. This model postulates that the environmental problem must be analyzed from the

institutional level of society down to behavior as in Figure 1. Most research to date has been conducted at the lowest three levels of the model effectively ignoring the top two levels. While a few researchers have begun the analysis at the level of value systems, only a few studies have begun the examination of the institutional, or DSP, level. Kilbourne, McDonagh, and Prothero (1997) and Grunert-Beckmann and Kilbourne (1997) examined the political, economic, and technological dimensions of the DSP and Thompson and Barton (1994) examined the anthropocentrism dimension. Only Grunert-Beckmann and Kilbourne (1997) took in the institutional, values systems, and general environmental belief levels of the model, however. This study represents an extension of previous work by including the anthropocentrism dimension with the lower levels of the model.

Using samples from three different countries, Denmark, Spain, and The Netherlands, the study provides an examination of the model but is restricted to only part of the DSP in that it includes only the anthropocentrism dimension. The results of the study provide sufficient evidence about the model to warrant further research taking in the entire model, however. In the first stage of the analysis it was shown that the anthropocentrism dimension of the DSP was related to two of the higher order dimensions of VS, self-transcendence and self-enhancement. The specific relationship was established as inverse for TRAN and direct for EGO as was hypothesized. This suggests that if individuals are high on the ANTH dimension of the DSP, this will lead to values that are antithetical to environmentally responsible behavior. Self-enhancing individuals seek to further their own personal interest or achievements by securing power over others and their environment. They would thus be less likely to consider environmental consequences of their behavior. Conversely, self-transcendence individuals are more concerned with others and are prone to universalize their actions by considering the larger consequences of them. As can be gathered from this, more anthropocentric individuals would tend toward EGO and more ecocentric individuals would be higher on TRAN. This is supported by the analysis.

The next link in the model is that between VS and general ecological beliefs. The latter is determined in this study through three measures of environmental attitudes, perception of the existence of ecological problems, environmental concern, and perception of the condition of the environment. The analysis indicates that the two most important determinants of environmental attitudes are TRAN and EGO. As hypothesized, TRAN is positively related to environmental attitudes and EGO is negatively related. This relationship can again be attributed the nature of the two value domains. Individuals high on TRAN universalize the consequences of their actions beyond themselves and are not oriented toward power and external control, i.e., they would tend to be ecocentric. Conversely, those high on EGO seek power and control. Their beliefs about the environment and its condition would be moderated by their power and control orientation resulting in what Ehrenfeld (1978) refers to as the arrogance of humanism, the erroneous belief that power and control can be exercised effectively over nature. Consequently they would be less likely to be concerned about environmental problems and their relationship to them. This is also supported by the results of the study.

The model suggests that from here, one's general environmental beliefs would lead to behavioral intentions in a general rather than specific way. This suggests that links to such specific behaviors as recycling or energy conservation might be less

predictable than the willingness to make personal tradeoffs for environmental well-being. This proposition was examined in stage three of the analysis. Here, general environmental attitudes were shown to directly affect willingness to consume less and to trade off economy for environment. Further, it was shown that individuals with high levels of concern believed that greater social change was necessary to achieve environmental well-being. This is the link that has been demonstrated in past environmentally related marketing research, but without the structural antecedents to it. It suggests that, not surprisingly, one is more likely to react positively to the environment if environmental concern is high.

Finally, differences between the countries in the sample were examined and it was found that respondents from the different countries held very different views at all levels of the model. The results indicated that respondents from Spain were significantly higher on both willingness to consume less and the amount of social change necessary to achieve environmental well-being. For CONS, Denmark and The Netherlands were not different from each other, and for SOC, Denmark was significantly lower than Spain while The Netherlands was intermediate and not different from either of the others. The differences between countries are not revealing however, unless we also examine the antecedent conditions. When the entire model is examined in sequence from the DSP to VS to general environmental beliefs, the lower level measure of intentions becomes more meaningful.

It appears then that Spanish respondents exhibit the greatest level of concern because they are the least anthropocentric (most ecocentric), the highest on self-transcendence, lowest on self-enhancement, believe to a greater extent that ecological problems do exist, and perceive that the condition of the environment is deteriorating. According to the model proposed, this should result in a greater willingness to consume less than respondents in the other two countries and the perception that greater social change is necessary to achieve environmental well-being. This is supported by the data through most of the model. The only exception is their willingness to trade off economy for environment which was not significant, although it did exhibit the same pattern as the other two measures. Thus, while it is true that respondents from the three countries differ in their environmental attitudes, the differences can be attributed to their positions on the DSP, VS, and general environmental beliefs. This provides support for the model suggesting that environmental attitudes are a much more complex phenomenon than is indicated by previous research that examined only the lower levels of the model.

Future research need to focus on all levels of the model simultaneously if a better understanding of environmental behavior is to be achieved. The simplistic notion that increasing environmental concern will somehow result in environmentally benign behavior should by now be left behind in favor of a more comprehensive view of the problem. To effect enduring transformations in behavior, the problem must be addressed at all levels of the model with changes effected at all levels from the DSP down to specific behaviors. Starting at the lower levels and letting attitudes filter upward through feedback loops, while useful in the absence of another strategy, may well be too slow to circumvent environmental decline. The more effective strategy would be to start at the top and work down.

6. Limitations

There are a number of limitations in the present study which must be recognized. The most obvious is the limited sample consisting of university students. The scope of the study is currently being expanded to include random samples for the three countries in the study and others as well. Because of the limited sample size, a more sophisticated method of analysis could not be used. While LISREL or path analysis would be preferred, the number of variables measured precluded their use here. Likewise, the entire domain of the DSP could not be examined for the same reasons. The additional data that are currently being collected will rectify both of these problems. It was felt, however, that the somewhat exploratory nature of the study justified proceeding despite these immediate limitations.

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Appendix 1: Ten motivational domains of values

- *Self-direction* (SDI, individualistic domain):

The motivation for this value type is independent thought and action, derived from the organismic need for mastery and control through choosing, creating, and exploring, and interactional requirements of autonomy and independence. It means to be unconstrained by externally imposed limits.

- *Stimulation* (STI, individualistic domain):

Stimulation values are related to the need for variety in order to maintain an optimal level of activation and their motivational goals are excitement, novelty, and challenge in life.

- *Hedonism* (HED, individualistic domain):

Closely related to stimulation, this value type is described as representing pleasure and sensuous gratification for oneself.

- *Achievement* (ACH, individualistic domain):

This domain is defined by the goal of personal success through demonstrating competence according to social standards and thereby obtaining social approval.

- *Power* (POW, individualistic domain):

The central goal of power values is the attainment of social status and prestige, control or dominance over people and resources.

- *Security* (SEC, individualistic and collectivist domain):

This motivational domain derives from basic individual and group requirements and represents the goal of safety, harmony, and stability of society, of relationships, and of self.

- *Conformity* (CON, collectivist domain):

Restraint of actions, inclinations, and impulses likely to upset or harm others and violate social expectations and norms, this is the defining goal of this value type.

- *Tradition* (TRA, collectivist domain):

The motivational goal of tradition values consists of respect, commitment, and acceptance of the customs and ideas that one's culture or religion imposes on the individual.

- *Spirituality* (SPI, collectivist domain):

This domain should encompass all those values that represent the attainment of meaning in life and inner harmony through transcending everyday reality.

- *Benevolence* (BEN, collectivist domain):

Benevolence values are motivated by the goal to preserve and enhance the welfare of those people with whom one is in frequent personal contact.

- *Universalism* (UNI, individualistic and collectivist domain):

This domains' motivational goal consists of the understanding, appreciation, tolerance, and protection of the welfare of all people and nature.