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By

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ABSTRACT

THE IMPACT OF PERSONAL VALUE STRUCTURES ON CONSUMER PROENVIRONMENTAL ATTITUDES, BEHAVIORS, AND CONSUMERISM: A CROSS-CULTURAL STUDY

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This study develops and tests a conceptual model that features the role of personal value structures in guiding individuals' environmentalism. While prior research has shown that personal values may influence pro-environmental behaviors, little research has been done that investigates how variables such as environmental attitudes mediate between abstract personal values and specific pro-environmental behavior. This study also examines how personal values affect the perception of pro-environmental attributes and buying-green products. This is one of only a few recent attempts to understand psychological antecedents of pro-environmental behavior in a causal approach and across two national groups (U.S. and Korean).

This study investigates the impact of three variables on pro-environmental behavior; that is, values, environmental attitudes, and perceived consumer effectiveness. According to the proposed theoretical framework, the ecology subtype of Self-Transcendence/Openness to Change (i.e., biospherism) has a positive influence on pro-environmental behaviors directly and indirectly via high pro-environmental attitudes. However, the Korean subjects showed the importance of environmental attitudes that mediate between their abstract values and their specific behaviors.

Additionally, the study investigates the links between the ecology subtype of Self-Transcendence/Openness to Change and preference for environmental attributes, and

between preference for environmental attributes and purchase of green product. This study also explores the effects of cultures on personal value orientations and commitments to pro-environmental behaviors. As a result, this study demonstrates that personal values play an important role in determining individuals' environmental sensibility and suggests that the relationship between attitudes and behavior can be stronger in some cases than in others. Perceived consumer effectiveness (PCE) has been found to have moderating effect on the attitudes and behavior relationship as well as direct impact on individually oriented pro-environmental behaviors. Finally, these findings have important implications for marketing communicators intending to target consumers with pro-environmental options.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

Chapter 1

INTRODUCTION

Environmental protection issues have come to the forefront of the international business agenda. Surveys indicate that consumers have become more concerned about environmental problems and that they recognize the need for pro-environmental behavior. Many surveys have recorded noticeable shifts in the growth and diffusion of green marketing and ecologically conscious consumer behavior (e.g., Kelly, 1993; Levin, 1990; Cramer, 1991; Roper Organization, 1992; Hastak, Horst, and Mais, 1994; *Marketing News*, 1997).

However, there is skepticism about how behaviorally committed consumers are to environmentally friendly ideas. There is little evidence that the growing concern for environmental issues has translated into pro-environmental consumer behavior (Schwartz and Miller, 1991). For many years, the inconsistency between a consumer's ecological concern and related behaviors have troubled green marketing strategists and ecologically minded social marketers who may wish to facilitate pro-environmental behaviors.

Social scientists have tried to identify and explain variations in public concern with environmental issues and actual commitment by using demographic and psychographic variables. However, studies examining demographic variables (e.g., age, gender, income, education) provide equivocal evidence about their relationship with pro-environmental behavior and to date suggest that demographics are rather poor predictors of pro-environmental behavior. Consequently, attention has been paid to psychological

factors. Fortunately, there has been evidence that heavier participants in environmental protection activities can be significantly distinguished by using psychological variables such as personal values (Granzin and Olsen, 1991). Psychological information tells us about the internal make-up of individuals which may cause different reactions to the same issues. Such information allows marketers to understand the motivations of the consumer, that is, why consumers behave as they do. According to Shrum et al. (1995), three psychological constructs are important in understanding environmentally conscious behavior: attitudes, values, and traits. Attitudinal antecedents are believed to guide behavior. However, few studies have addressed the nature of the links among the attitudinal antecedents and behavior. Furthermore, research by psychologists on environmental issues has been criticized fir their lack of universality, that is, most of them are culture specific (Schultz and Zelezny, 1998).

Statement of the Problem

This study investigates the role personal values play in guiding individuals' environmental attitudes and behavior, and provide a fuller, conceptual model to better understand the antecedents of environmentally conscious behavior across cultures. Values are considered to be the fundamental source of an individual's environmental sensibility. It is one of a few recent attempts to understand environmental attitudes, beliefs, and behaviors across cultures.

As a result, this study will explain how values can influence pro-environmental behaviors directly and indirectly through attitudes and beliefs toward the environment. This research will develop a model of the value-attitude-behavior relationship and test the

model on samples of the U.S. and Korean college students. Testing the model within and across cultures indicates if the model may be applicable to various groups beyond cultures. Specifically, all of this research will demonstrate the following: First, research on values as a fundamental basis of environmental attitudes and behavior will suggest that certain value dimensions are linked to environmental attitudes and pro-environmental behaviors (specifically buying green) via positive attitudes toward the environment. To test this, different levels of consumer responses to environmentally friendly products as well as general pro-environmental behavior will be examined. As consumer responses to green products, two factors are measured: (1) the importance of environmental attributes in consumers' choice criteria and (2) purchase of green product. Second, considering PCE as a moderator will (a) strengthen the model in predicting environmentally conscious behaviors - that is, this will extend understanding of attitude-behavior correlation by examining the moderating role of PCE in the context of general proenvironmental behavior and particular ecological purchase - and (b) clarify what kinds of pro-environmental behaviors PCE predicts significantly, which has been in disagreement. Third, the test of the value-attitude-behavior model on samples of the U.S. and Korean students will provide additional opportunity to explore the impact of cultural differences on (a) their value orientations and thus, (b) their proenvironmental attitudes and behaviors. This study proposes that environmental behavior may be different in different cultures, due to the differences in value orientations that may be affected by culture. That is, cultural differences can be used as independent variables affecting people's value orientations, and their value orientations, in turn, influence their attitudes and beliefs toward the environment and finally their proenvironmental behavior. In

contrast to previous studies, clusters of consumer values will be examined rather than limiting the research to one main value of concern for the environment.

The prediction of pro-environmental behavior is still a field with a high degree of uncertainty and in need of more research. This cross-cultural study is expected to solve some problems by enhancing understanding of the factors that lead people to act in proenvironmental ways. The understanding of the antecedents of proenvironmental behaviors across cultures will benefit marketing practitioners (especially, international marketing people) by providing insight into how to develop effective promotional strategies. The closer we move to an understanding of what causes some people to behave proenvironmentally while others do not, the better we will be able to design public policy and marketing programs aimed at increasing proenvironmental behavior. Moreover, this research may provide information for marketing strategy that might be useful in overcoming the environmentally unconscious behavior of some consumers. Finally, it will also assist our understanding of cultural impact on pro-environmental attitudes and behavior.

Theoretical Base and Research Overview

The theoretical base for this study is derived primarily from attitude research investigating the cognitive (attitudinal) antecedents or dispositions believed to guide the behavior. Specifically, Schwartz's theory of altruism (1977), Stern et al.'s social psychological model (1993), and the Value-Attitude-Behavior model (McCarty and Shrum, 1993, 1994) provide theoretical underpinnings. Also, Schwartz and Bilsky's (1987, 1990) theory of the universal content and structure of human values will assist

theorizing about the relationships among values and between values and other psychological variables such as attitudes, beliefs, and behavioral intentions. The psychological literature examining the role of value priorities in behavior, particularly prosocial behavior, and the marketing literature investigating the effect of consumer value structures on choice criteria will provide useful insights into understanding environmentally conscious consumer behaviors.

Schwartz's Norm-Activation Model

Pro-environmental behavior has been interpreted mainly in the light of Schwartz's theory of activation of altruistic norms (see Widegren, 1998), considering altruistic aspects of motivation to behave in an environmentally friendly manner. Some scholars suggest that behaviors that are driven by environmental concern are within the boundaries of the domain of morality (Van Liere and Dunlap, 1978; Stern, Dietz, and Black, 1986; Guagnano, Stern, and Dietz, 1995; Hopper and Nielsen, 1991). Under this recognition, Schwartz's norm-activation model of altruism has been used to explain actions intended to ameliorate environmental problems. Schwartz's theory of altruism implicitly assumes (Stern et al., 1993) that "people have a general orientation toward the welfare of others (e.g., altruistic value orientation), that is, they value outcomes that benefit others and can be motivated to act to prevent harm to others" (p. 324). Consequently, pro-environmental behavior will follow from this social or altruistic value orientation.

The Social Psychological Model

Stern, Dietz, and Kalof (1993) expand the Schwartz model which treats environmental concern as altruism toward other human being, to incorporate both self-interest, or egoism, and concern with other species or the biospheric itself. They

recognize that environmentally conscious behavior can reflect a trade-off between altruistic and egoistic motivations, and therefore that egoistic value orientations as well as social-altruistic ones are implicated in environmental attitudes and behavior. Concern with nonhuman species or biospheric values can be postulated to have a role in behavior analogous to the role of social-altruistic values in the Schwartz model of moral norm-activation. Stern et al. (1993) proposed a social psychological model that presumes that the pursuit of environmental quality may stem from any of three value orientations: egoistic, social-altruistic, and biospheric. Their results showed that these three value orientations might underlie environmental attitudes and behavior.

Schwartz and Bilsky's Theory of the Universal Content and Structure of Human Values

Schwartz and Bilsky (1987, 1990) have developed a theory-based approach to measuring values and tried to identify cross-cultural universals in the structure and content of human values. The theory assists theorizing about the relationship between values and other psychological variables such as attitudes, beliefs, and behavior. Schwartz (1992) identified 10 motivational types of values that are likely to be recognized within and across cultures and used to form value priorities. According to him, the 10 value types can be classified into 4 broader clusters that have been reliable across cultures. These groups of values are referred as: 1) openness to change, 2) self-enhancement, 3) conservation, and 4) self-transcendence. Schwartz's Self-Enhancement cluster, according to Stern et al. (1993), is very close to the egoistic values on which pro-environmental attitudes might rest. Also, Schwartz's Self-Transcendence cluster encompasses the biospheric and altruistic values. Schwartz's (1992) model indicates the negative relation between the self-enhancement and the self-transcendence values, and

another negative relationship between the openness to change and conservation values. The self-enhancement and self-transcendence domains are unrelated to the openness to change and conservation domains (see Figure 1).

The Value-Attitude-Behavior Model

Environmentally conscious behavior can be characterized as pro-social behavior from the perspective that such behavior is primarily performed for the sake of others (Guagnano, Stern, and Dietz, 1995; Hopper and Nielsen, 1991). This pro-social behavior may be influenced by values that transcend self-interest. Karp (1996) found that values related to a concern for the welfare of others have a positive influence on environmental behavior and that values oriented toward the pursuit of self-interest have a negative influence on environmental behavior. Environmentally conscious behaviors which are mainly intended to benefit another might be related to one's concern for others and nonhuman species. Past research has suggested that values play a role in specific situations when they are activated by a set of altruistic concerns (Schwartz, 1977; Hopper and Nielsen, 1991; Stern, Dietz, and Kalof, 1993). Therefore, the extent to which individuals engage in such pro-environmental behaviors would be influenced by their values.

On the other hand, the research linking personal values with pro-environmental behavior, such as recycling, suggests that the influence of values on behavior is mediated through attitudes and beliefs (McCarty and Shrum, 1993, 1994). That is, the influence of values may not be apparent in instances when critical mediating constructs are not explored. Stern and Dietz (1994) also indicate that value orientations affect behavioral intentions both directly and indirectly (through beliefs). So it is required to consider a

fuller model of variables rather than a model using simple bivariate correlations like the value-behavior relation. The value-attitude-behavior model may provide the foundation for ecologically conscious behaviors. Theoretical links such as values/attitudes, attitudes/behavior, and values/behavior in relation to environmental issues are beginning to receive empirical confirmation. Value theory and the literature clearly suggest that pro-environmental behavior can be affected by environmental attitudes flowing from a value orientation that reflects concern for the welfare of other human beings, concern with nonhuman species, self-interest, or some combination of the three orientations.

Attitude and Perceived Consumer Effectiveness (PCE)

Attitudes have been one of the most widely used variables in understanding environmentally conscious behavior. Attitude, as it is measured and used, represents a consumer's general ecological orientation. However, attitude has shown varied results as a predictor of environmental behaviors; for instance, attitude is significant enough to show meaningful relationship with the behavior and sometimes insignificant. Thus, some researchers were led to consider other variables that have been offered as reasons for attitude-behavior consistency. This perspective has identified several categories of variables that "moderate" the relationship between attitudes and behavior (Berger and Corbin, 1992). Personal traits such as perceived consumer effectiveness (PCE) form one of those categories. PCE is a domain-specific belief that individuals' actions make a difference in solving a problem (Ellen, Weiner, and Cobb-Walgren, 1991). PCE has been considered a factor influencing an individual's willingness to engage in environmentally friendly behaviors, beyond simple concern for the environment. Therefore, the relationship between environmental attitudes and behavior can also be examined by using

PCE, which moderates the influence of attitudes on behavior. For example, an individual may feel very concerned about an environmental issue (pollution in water) and at the same time, completely helpless in his or her ability to have an impact on the problem through his or her own consumption. In this case, he or she will be less likely to buy environmentally friendly products. That is, he or she shows low levels of environmental behavior, despite high levels of concern. Attitudes are not consistent with the consumer's personal behavior. By contrast, another individual may not be at all concerned about the environment and may believe that individual effort could be effective but is patently unnecessary. This person is likely to have low attitude score, high PCE score, and again low levels of environmentally friendly consumer behaviors. These two situations could be captured by modeling PCE as a moderator of the relationship between attitudes and consumer behavior, such that attitude-behavior correlations are expected to be high when PCE is high and low when PCE is low. This consideration may provide a better understanding of when environmental attitudes will influence behavior, and why.

The Relationship Between Values and Choice Criteria

Buying green indicates purchases reflecting a consumer's preference for environmentally considered products. Based on the previous literature, consumers' preference for environmentally friendly products can be explained in relation to their value structures. Consumer value structures were found to be linked to the importance of product attribute (choice criteria) for product brands. This evidence has inspired one of the purposes of this study: to investigate the relationship between certain value priorities and the perceived importance of environmentally considered attributes. For instance,

consumers who place more importance on self-transcendence/openness to change values will value environmentally safe attributes more highly.

Effects of Culture on the Model

Relatively little is known about the relationships among values, attitudes, and environmental behavior, particularly when a cultural variable such as ethnicity is considered. The test of the model on samples from different countries will allow us to examine the role of values in guiding pro-environmental attitudes and behavior within and across cultures, and it will further provide an opportunity to explore the effects of culture on individuals' environmentalism. For example, this study will investigate whether the significant difference between the U.S. and Korean subjects in terms of their pro-environmental behavior can be explained, in part, by any difference in their value priorities.

Empirical evidence suggests that culturally based attitudes and values can influence general orientation toward environmental problems and issues. Particularly, culturally oriented values such as individualism-collectivism appear to influence environmental behavior (see McCarty and Shrum, 1994). According to Hofstede (1983), Korean and American cultures show the most contrast in individualism-collectivism; that is, Korea is a predominantly collectivistic culture and America an individualistic culture. In contrast to individualism, collectivism refers to a higher valuation of needs and goals of the collectivity than of individual needs and goals. Research on collectivist versus individualist cultures suggests that the extent of collectivism or individualism of a society or country may affect value priorities individuals hold. For instance, according to Schwartz's scale of values, individualist or collectivist cultures may be positively related

to self-transcendence values which are proposed to affect pro-environmental attitudes and behavior. Therefore, this study proposes that the U.S. and the Korean subjects may show different levels of pro-environmental attitudes and behavior because of the differences in their value priorities (e.g., valuing Self-Transcendence/Openness to Change), influenced by their cultural differences (e.g., individualistic or collectivistic culture).

The Various Types of Pro-environmental Behaviors

The psychological variables indicated above will be related to a broad range of pro-environmental behavior in this study. Studies of environmental behavior have traditionally examined single behaviors such as recycling (Derksen and Gartrell, 1993) or energy conservation (Weiner and Doescher, 1994). However, different types of pro-environmental behaviors do not appear to be closely related to one another (e.g., Lee, DeYoung, and Marans, 1995; Oskamp et al., 1991; Pickett, Kangun, and Grove, 1993; Tracy and Oskamp, 1983-1984). That is, it is very hard to say that participation in energy conservation or other pro-environmental actions significantly predicts green-buying behavior (see Mairieri et al., 1997). In addition, literature concerning PCE indicates that consumers with high levels of PCE are more likely to engage in pro-environmental behaviors than consumers without that belief. However, the relationship appears to be behavior specific; i.e., consumers consider some behaviors to be effective and others not (see Ellen, Wiener, and Cobb-Walgren, 1991). It would be interesting to find what types of pro-environmental behaviors can be significantly predicted by PCE. Specifically, the relationship between PCE and various types of pro-environmental behavior will contribute to improve the disagreement existing between the variables.

Chapter 2

REVIEW OF THE LITERATURE

This research centers on the determinants of pro-environmental consumer behaviors. It is believed that values, attitudes, and personality traits such as PCE are important psychological variables in relation to environmental behavior. This study proposes that personal value orientations influence individuals' environmental attitudes, and that these attitudes impact consumers' decisions to buy green as well as other environmentally conscious consumer behaviors.

It also proposes that the value-attitude-behavior model fits well in the context of different cultures. Furthermore, this study presumes that the differences in valuing self-transcendence and openness to change and in collectivism can account for the differences in the degree of pro-environmental behaviors across cultures.

To provide a theoretical background for this research, this study briefly reviews literature in the following broad areas: (1) psychological antecedents of environmentally conscious behaviors, (2) the value-attitude-behavior hierarchy, (3) the relationship between values and consumer choice behavior, (4) environmental consumerism, and (5) culture and environmentalism.

Determinants of Environmentally Conscious Behavior

Social marketers have found that various reactions to environmental issues exist among people. Therefore, the main concerns of these marketers have been focused on a

critical question: "What causes different attitudes and behaviors in relation to environmental problems?" For the past decades, psychologists have attempted to understand the factors that lead people to participate in environmental programs (Schultz, Oskamp, and Mainieri, 1995). Research has examined demographics, attitudes, beliefs, and personality as predictors of environmental behavior (Oskamp, Burkhardt, Schultz, Hurin, and Zelezny, 1998; Schultz and Oskamp, 1996; Steel, 1996; Vining and Ebreo, 1990). This research has produced some correlates with certain demographic factors among U.S. samples. The list of correlates includes age (negative), gender (female), education (positive), income (positive), and also shows positive correlations with general environmental attitudes, specific pro-environmental attitudes, and locus of control. Despite the established findings, demographic categories have been poor predictors of pro-environmental behavior because of the typically small effective size and/or the conflicting results of research (e.g., Neuman, 1986; Samdahl and Robertson, 1989). This poor relationship between demographic factors and some attitudinal and behavioral variables indicated a "demographic shift" in the nature of the environmentally concerned public (e.g., Howell and Laska, 1992). Thus, demographic characteristics that formerly predicted environmental concern are no longer closely associated with it (Mainieri, Barnett, Valdero, Unipan, and Oskamp, 1997). Consequently, it becomes increasingly important to understand psychological factors underlying environmentally conscious behaviors. The large psychological research has provided useful theories of environmental behavior. Especially, viewing pro-environmental behavior as based on altruistic motivation leads to a variety of potentially useful predictors.

A great deal of studies have attempted to study the psychological nature of the environmental conscious consumer. These studies can roughly be divided into the following categories: (a) personal values, (b) attitudes and beliefs, and (c) trait variables (Shrum, Lowrey, and McCarty, 1994). Each is discussed below.

Personal Values

Milbrath (1986) notes that current ecological problems are a result of a crisis in human values. A number of studies, in fact, have indicated that the values people hold are related to pro-environmental behaviors (Granzin and Olsen, 1991; Shean and Shei, 1995; Karp, 1996; Lee and Holden, 1999). Several authors have speculated that environmental attitudes and behaviors are the results of underlying values (Fishbein and Ajzen, 1975; Harbin, 1977; Rozak, 1992). Personal values have been shown to be useful in explaining people's attitudes and activities toward environmental protection. Value and belief variables explain much more of the difference between environmentalists and non-environmentalists than do socio-demographic variables (Milbrath, 1979, 1981b, 1984; Dietz, Stern, and Guagnano, 1998). Placing a high value on preserving the natural environment and on closeness to nature and living in a beautiful world has been linked positively to environmental protection attitudes and activities (Dunlap, Grieneeks, and Rokeach, 1983; Neuman, 1986; Rankin, 1983). The importance of living a prosperous, comfortable life has been shown to be related negatively to environmental protection activities (Dunlap, Grieneeks, and Rokeach, 1983; Rankin, 1983) and to recycling activities (DeYoung, 1985-1986). More recently, Shean and Shei (1995) conducted a survey with environmentally active students. According to them, the environmentally

active students placed significantly more importance on the values of responsibility and concern for the welfare of others than on personal affluence and political achievement.

Specifically, Herberlein (1972) claimed that protecting the environment is perceived as a moral and altruistic issue because environmental damage has negative consequences for others. As a result, a number of studies have demonstrated that Schwartz's (1970, 1977) theory of altruism, in which altruistic behavior is seen as resulting from the activation of (personal) norm, can be used to predict environmentally conscious behaviors (Black, Stern, and Elworth, 1985; Guagnano, Dietz, and Stern, 1994; Hopper and Nielsen, 1991; Stern, Dietz, and Black, 1986; Stern, Dietz, and Guagnano, 1995). Schwartz's norm-activation model explains when an altruistic behavior is more likely to occur. That is, people develop a sense of moral obligation to act in ways that benefit rather than harm others when they both become aware of the harmful consequences of their actions for others and ascribe responsibility for these consequences to themselves. Applying this model, pro-environmental behavior can be viewed as an altruistic action that is motivated by an internalized moral norm grounded in values concerned with the welfare of others

Stern, Dietz, and Kalof (1993) found that the Schwartz model could predict environmental behavioral intentions. Stern et al. (1993), however, argued that environmentally relevant behavior can stem from three distinct value bases: the welfare of others, the harmful consequence environmental damage will have for self (termed egocentric), and the harmful consequences environmental damage will have for all living things (termed biocentric). That is, egoistic value orientations as well as social-altruistic ones are implicated in environmental attitudes and behavior (Stern et al., 1993). Bagozzi

and Dabholkar (1994), in a means-end chain analysis, show that both egoistic and altruistic goals drive environmental behavior but that altruistic goals tend to dominate.

Egoistic and altruistic value orientations are reflected in value clusters identified by Schwartz (1992). More recent work by Schwartz (1992, 1994) has gone beyond the welfare of others in an attempt to characterize the domain of human values. According to Schwartz (1992), values are arrayed along two dimensions: self-enhancement/self-transcendence and openness to change/conservation. Self-transcendence is an orientation toward the welfare of others, whereas self-enhancement is an orientation toward self-interests. Openness to change reflects the degree to which a person is motivated to follow his or her own emotional and intellectual interests, whereas conservation reflects a motivation to preserve the status quo (Schwartz, 1992).

Recent research based on Schwartz's theory is limited but it has demonstrated the link between values and behavior. Stern, Dietz, Kalof, and Guagnano (1995) conducted telephone interviews with 199 randomly selected adults in Fairfax, Virginia. Values were measured using Schwartz's dimensions of self-transcendence, self-enhancement, openness to change, and conservation. Stern et al. (1995) proposed that each of the three value-based sets of environmental concerns could be measured with selected items falling within Schwartz's (1992) value dimensions. The egoistic orientation was measured with items from self-enhancement; the social altruistic orientation was measured with items from self-transcendence that were specific to other people; the biospheric orientation was measured with items from self-transcendence that were specific to the natural environment. Behavior was measured with self-reported intentions. Regression analyses

revealed a positive relationship between biospherism and pro-environmental behavior but non-significant relationship for the other value orientations.

Similar results were found by Karp (1996) in a study of 302 U.S. undergraduates. Values were measured using all 56 value items of Schwartz's scale, and environmental behaviors were measured by self-reported frequency of participation in eight environmental activities. A factor analysis produced four value factors that correspond to each quadrant of Schwartz's model: self-transcendence/conservation, self-transcendence/openness to change, self-enhancement/openness to change, and self-enhancement/conservation. As predicted by the researcher, the self-transcendence/openness to change values were significantly positively related to environmental behaviors, and self-enhancement/conservation values were negatively related to the behaviors. Neither of other two value dimensions correlated with pro-environmental behavior.

More recently, Schultz and Zelezny (1998) conducted a multinational survey that was designed to examine the relationship between values and pro-environmental behavior in different countries and to examine the relationship between values of self-transcendence and pro-environmental behavior with respect to the norm activation model. Survey data were collected from college students in Mexico, Nicaragua, Peru, Spain, and the United States. The results from the study clearly indicate that pro-environmental behavior is positively associated with values, particularly biospheric value items of self-transcendence. This finding was consistent across the multinational sample. In addition, the regression analyses showed a negative relationship between self-enhancement and pro-environmental behavior.

These findings suggest that values, particularly self-transcendence values, play an important role in determining environmentally responsible behavior. The negative relationship between self-enhancement and pro-environmental behavior can be interpreted as evidence that egoism is related to less pro-environmental behavior. However, literature indicates that most of evidence about the relationship between values and pro-environmental behavior comes from U.S. samples and that the value-attitude-behavior relationship represent a neglected level of analysis in the study of environmentally sound behavior, especially buying green.

Attitudes and Beliefs

Concerns for environmental problems represent predispositions of human beings that influence behavior in certain favorable and unfavorable manners. These predispositions are commonly referred to as attitudes (Ajzen and Fishbein, 1980; Scheider, 1988). Attitude has been a fundamental part of environmental studies. Over the past decades, national opinion polls have shown a consistently high level of awareness of and concern for environmental problems (e.g., Gallup & Newport, 1990; Roper Organization, 1990). As the number of people expressing environmental concern and engaging in ecological activities has grown, the economic and social diversity of this environmental public has widened to include people from diverse backgrounds (Mainieri, et al., 1997). Therefore, many empirical investigations have indicated that demographics may not be as clearly tied as they were previously to environmental concern and behavior (Hines, Hungerford, and Tomera, 1986-1987; Samdahl and Robertson, 1989). For example, a positive relationship between education and pro-environmental attitudes (Vining and Ebreo, 1990) appeared to be weakening (Gallup & Newport, 1990).

Likewise, though some studies have reported that income predicts environmental concern and activity (Gamba and Oskamp, 1992), the differences in environmental concern among socioeconomic groups are gradually vanishing (Gallup & Newport, 1990; Hines, Hungerford, and Tomera, 1986-1987; Samdahl and Robertson, 1989). A recent study (Mainieri et al., 1997) indicated that gender and consumer beliefs predicted environmental attitudes. That is, women were more concerned than men about environmental matters, and participants with specific beliefs about the environmental impact of the purchase and use of consumer products were also likely to hold pro-environmental attitudes. But age, income, and education were not related to any of the attitudinal and behavioral variables. Accordingly, much of the social-scientific investigation of environmental attitudes, rather than remaining focused on demographic predictors, has turned instead to explanation for the widespread popularity of environmental issues (Wall, 1995). Cultural change theories that have been advanced to explain widespread environmental concern revolve around the concept of post-materialist value change (see Inglehart, 1990). The value-change theories emphasize psychological factors as the most important determinant of attitudes (Rohrschneider, 1990). Further, Schultz (2000) tested the structure of people's concern for environmental problems by using social-psychological research on prosocial behavior. Stern and Dietz (1994) proposed that attitudes of environmental concern are rooted in a person's value system (see also Stern, Dietz, and Kalof, 1993; Stern, Dietz, Kalof, and Guagnano, 1995). They argued, as mentioned above, that people's attitudes about environmental issues are based on the value that they place on themselves, other people, or plants and animals. Stern and Dietz (1994) termed these three value-based environmental concerns egoistic, social-

altruistic, and biospheric. Schultz (2000) used confirmatory factor analysis and demonstrated that environmental concerns are based on the negative consequences that could result for valued objects that can be classified as self, other people, or other living things. In contrast to the theories that place major emphasis on people's value systems, there are theories that emphasize the social context that shapes motivation as the most important determinant of attitudes (Dunlap, 1989; Lowe and Rudig, 1987; Uusitalo, 1990; Rohrschneider, 1990). The theorists behind these studies argue that given the broad array of problems that are defined as environmental issues, the probability that individuals will be affected by one or more of these issues is high (Dunlap, 1989; Mitchell, 1990). Thus, the diversity and intensity of environmental problems as experienced by the public are themselves proposed as an explanation for the widespread nature of environmental concern.

On the other hand, a key research question has been whether environmental attitudes predict actual behavior in relevant situations. If an attitude is "an enduring set of beliefs about an objects that predispose people to behave in particular ways toward the object" (Weigel, 1983, p. 257), one may expect people with a pro-environmental attitude to act in ways consistent with that attitude. There is plentiful empirical evidence that individuals' environmental ecological concern level is a useful indicator of ecologically conscious behaviors, such as purchase behaviors (Kerr, 1990; Donaton and Fitzgerald, 1992; Ottman, 1993; Schlossberg, 1992; Wall, 1995; Chan, 1996), recycling (Arbuthnot and Ligg, 1975; Kellgren and Wood, 1986; Simmons and Widmar, 1990; Wall, 1995), and a general pro-environmental behavior (Lee and Holden, 1999). However, a meta-analysis about the attitude-behavior relation indicates that depending on the nature and

measurement of each of the variables (Hines, Hungerford, and Tomera, 1987), attitude has shown varied results as a predictor of environmental behaviors. While some studies have found a positive relationship between environmental concern and ecologically responsible behavior, others have found a weak relationship or no significant relationship between the two variables (e.g., Oskamp et al., 1991; Vining and Ebreo, 1990; Wall, 1995). Specifically, Wall (1995) suggests that environmental attitudes do have a limited influence on behavior. However, the analysis of consistency between attitudes and behavior also suggests that the relationship between attitudes and behavior is not a straightforward one, but rather that it is stronger in some cases than in others. Consequently, a substantial relationship between general environmental concern and specific environmental behaviors is questionable. Accordingly, researchers have focused on the conditions under which attitudes tend to drive behavior; one of the results suggests that other variables, such as affect (Smith, Haugtvedt, and Petty, 1994), perceived consumer effectiveness (Berger and Corbin, 1992), and faith in others (Berger and Corbin, 1992) should be considered.

Perceived Consumer Effectiveness(PCE)

As mentioned previously, some personality variables have been included to improve the attitudes and behavior correlation, which may also contribute to the understanding of the determinants of pro-environmental behavior. Especially, perceived consumer effectiveness (PCE) (Berger and Corbin, 1992; Ellen, Wiener, and Cobb-Walgren, 1991; Kinnear, Taylor, and Ahmed, 1974) has received a great deal of attention based on the evidence that PCE has been shown to be particularly important as a direct predictor of socially conscious personal behaviors. Perceived consumer effectiveness

was initially considered a measure or element of the attitude itself and consequently was modeled as a direct predictor of environmentally conscious behavior. Kinnear, Taylor, and Ahmed (1974) found empirical support for consumer effectiveness as ecological concern.

However, some studies show that attitudes and PCE can be modeled as two distinct constructs (see Ellen, Wiener, and Cobb-Walgren, 1991). Perceived consumer effectiveness is defined as a domain-specific belief that the efforts of an individual can make a difference in the solution to a problem. PCE may be affected by knowledge, direct experience, and the experiences of others (Brown, 1979; Thompson, 1981). Ellen, Wiener, and Cobb-Walgren (1991) demonstrate that PCE is distinct from environmental concern and contributes uniquely to the prediction of certain pro-environmental behaviors. The degree to which a person feels that he or she has little behavioral control over the performance of a behavior has been shown to uniquely reduce behavioral intentions and behavior, even under circumstances where attitudes toward the action are very favorable (Ajzen, 1985).

Berger and Corbin (1992, pp. 80-81) defined perceived consumer effectiveness (PCE) as "the evaluation of the self in the context of the issue," while an attitude is defined as simply an evaluation of an issue or problem (Tesser and Shaffer, 1990); they proposed PCE as moderator of the attitude-environmentally conscious behavior relationship. They hypothesized that PCE would moderate the relationship between general environmental attitudes and personal consumer behaviors. In support of the hypotheses, individuals with high level of PCE show higher attitude-consumer behavior correlation (e.g., low (high) attitude scores and low (high) level of pro-environmental

behavior) than those with low level of PCE. Though this tendency is present for all three kinds of behavior (i.e., consumer behavior, willingness to pay more, and support for regulatory actions), its greatest impact is on the behavioral measure that represents specific acts of personal responsibility. They also, however, recognized that PCE may operate as direct effects. Indeed, Ellen et al. (1991) found a direct effect of PCE on environmentally conscious behaviors.

On the other hand, if PCE is believed to motivate a wide variety of behaviors, then its role may be over- or understated, depending on the specific behaviors included. According to some theories, ranging from the theory of reasoned action (Gill, Grosby, and Taylor, 1986) to social dilemma theory (Wiener and Doescher, 1991), an individual's belief that an environmental problem can be solved by a specific action will strongly influence the individual's willingness to engage in that specific action. In other words, PCE should not be used to predict generalized pro-environmental behaviors. The findings showed that while concern was significantly related to all behaviors, effectiveness was a significant predictor for only three of the six behavioral measures: purchase, recycling, and contribution to environmental groups. Greater perceived effectiveness was associated with greater likelihood of performing these individual behaviors because according to social dilemma theory, the degree to which the individual feels his or her efforts to make a difference affects his or her performance of individually oriented activities (e.g., recycling), as opposed to political behaviors. On the other hand, perceived effectiveness was not a significant factor in a person's membership in groups or his or her communication with public officials, which is predicated on the greater effect of groups, rather than individuals.

Consistent with Berger and Corbin (1992), Lee and Holden's study (1999) found that PCE moderates the strength of the attitude-behavior relationship and is a significant positive predictor of high-cost consumer behaviors (such as contribution to or being a member of an environmental group, writing the government about the environment, and attending a meeting on environmental issues). That is, consumers with high PCE are more likely to adopt personal helping behavior. Interestingly, however, PCE did not significantly predict low-cost consumer activities, such as seeking out green products, avoiding harmful packaging, car pooling, walking or taking public transit in order to protect the environment, and recycling. The failure of PCE in predicting low-cost consumer behaviors may be due to a lower threshold (i.e., as the cost is minimal, the benefit does not have to be perceived as very high). As such, low-cost behaviors are less likely to be affected by consumers' perceptions of their own effectiveness. This indicates that while Ellen et al. (1991) and Lee and Holden (1999) agree that PCE may be a significant predictor of certain environmental activities, they might not agree on what types of behaviors can be significantly predicted from PCE.

This study may additionally be used to identify which kinds of pro-environmental behaviors are significantly or not significantly influenced by PCE. In sum, the review of the literature suggests that perceived consumer effectiveness is an important construct in the explanation of the relationship between environmental attitudes and personal consumer behaviors and an important predictor of certain pro-environmental behaviors by influencing the sensibility of consumer actions to changes in environmental concern.

For the past decades, it has been empirically supported that psychographic variables such as values, attitudes, and beliefs like PCE explain individuals' diverse

commitments to environmental protection better than any other variables such as socio-demographics. Thus, a theory that links values, attitudes, and behavior seems to work most persuasively in the field of environmental behavior.

Value-Attitude-Behavior Model

Rokeach (1968) views a value as a "centrally held, enduring belief which guides actions and judgments across specific situations and beyond immediate goals to more ultimate end-states of existence." Values are responsible for the selection and maintenance of the ends or goals toward which human beings strive and, at the same time, regulate the methods and manner in which this striving takes place.

Numerous scholars have suggested that behavior is a result of values and attitudes. Both Connor and Becker (1979) and Homer and Kahle (1988) propose that values provide the basis for the development of individual attitudes which lead to specific decision-making behavior. Values are conceptualized as determinants of attitudes and, consequently, as a causal influence on behavior (Tolman, 1951; Parsons and Shils, 1951). However, most of the earlier work on personal values addressed a simple bivariate relationship such as the value-behavior or the value-attitude link. The role of values has received limited empirical attention relative to its potential significance, especially within a causal modeling approach.

The value-attitude-behavior relationship has been investigated by several studies (e.g., Homer and Kahle, 1988; McCarty and Shrum, 1994), and the results support the hypotheses that values influence attitudes and that attitudes in turn influence behaviors, as the final phase in the value-attitude-behavior hierarchy. Homer and Kahle (1988)

examined personal values, attitudes about health foods, and the purchase of health foods within a causal modeling analysis. They discovered an indirect influence of values on shopping behavior, with attitudes providing a mediating role. McCarty and Shrum's (1994) study conceptually replicated the work by Homer and Kahle (1988) by demonstrating a link between values and attitudes, and attitudes and behavior, in the context of the socially conscious behavior of recycling solid wastes. McCarty and Shrum (1994) demonstrate a significant effect of collectivistic orientation on recycling attitude, which in turn affects recycling behavior. Collectivistic orientation tends to have an indirect effect on recycling behavior via the attitude toward the inconvenience of recycling. In particular, values were shown to have indirect effects on behavior: attitudes and beliefs provided a mediating role between the abstract values and specific behaviors.

Further, a review of research on values and behaviors provides a variety of evidence that differences in values have been related to significant differences in attitudinal and behavioral outcomes: cigarette smoking (Grube, Weir, Getzlaf, and Rokeach, 1984), automobile purchase (Henry, 1976; Sukhdial, Chakraborty, and Steger, 1995), fashion (Goldsmith, Heitmeyer, and Freiden, 1991), and media preferences (Beatty, Kahle, and Homer, and Misra, 1985).

Some authors (e.g., Stern, Dietz, and Kalof, 1993; Fishbein and Ajzen, 1975; Harbin, 1977; Rozak, 1992; Milbrath, 1979, 1981a) have speculated that environmental attitudes can flow from a value orientation that reflects concern for the welfare of other human beings. Stern and Dietz (1994) tested a theory about the basis of environmental concern in values. They found that environmental concern is related to egoistic, social-altruistic, and biospheric value orientations. Stern, Dietz, Kalof, and Guagnano (1995)

found that endorsements of self-transcendent or biospheric-altruistic values were positively associated with reported willingness to take political action to support environmental causes, whereas endorsement of self-enhancement values were negatively associated with willingness to take action. Such studies have provided evidence that values may have both a direct effect on behavioral measures and indirect effects flowing through concerns about the consequences of environmental changes for valued objects. Therefore, the literature review indicates the need to investigate the causal relationships among the three variables of values, attitudes, and behavior in order to find a better way to encourage people's pro-environmental behavior.

Values and Consumer Choice Behavior

Consumer value structures were found to be linked to the importance of product attribute (choice criteria) for product classes and brands. Salient product attributes are defined as those that are both important to the prospective buyer and used by the individual to differentiate between brands when deciding on which brand to purchase (Boote, 1981). Specifically, research interests in marketing have centered on predicting brand choice and assessing the relative importance of various product attributes in determining brand preference. It has been suggested that value acquisition represents a socio-cultural process and that differential value orientations will lead to variations in preferences for products and brands. Vinson, Scott, and Lamont (1977) investigated these propositions and found that the subjects from two culturally distinct regions of the United States were significantly different with respect to their basic value orientations and that values and the evaluation of product attributes were consistent with preference

for the consumer products or services. It is well accepted in the consumer behavior literature that cultural differences affect consumer behavior through their influence on consumer values, which are known to affect consumption motives and individual choice criteria (Bozinoff and Cohen, 1982; Omura, 1980; Valencia, 1989).

Values have been shown to directly influence the product attributes the individual evaluates in making purchase decisions (Pitts and Woodside, 1983). Pitts (1981) has demonstrated that homogeneous groups of individuals with similar value systems may be effectively developed and differentiated from dissimilar groups on the basis of education, income, and occupation. Howards (1977) contends that grouping consumers with similar values will provide groups with similar choice criteria and final behavior. Boote (1981) related personal values to specific product attributes in a study of preferences for restaurant services.

For activities and interests, Jackson (1974) found that value orientation affected both the individual's choice between work and leisure and the selection among alternative leisure activities. Pitts and Woodside (1986) examined the relationship between personal values and travel or leisure decisions and supported current conceptualizations of value influence on the individual. Values were shown to be related to differences in choice criteria and to actual behavior.

Environmental Consumerism

Environmental consumerism (green buying)-purchasing and consuming products that are benign toward the environment (Mainieri, Barnett, Valdero, Unipan, and Oskamp, 1997)-began to receive serious attention in the early 1970's. The studies

reported in the marketing literature have focused on the characteristics of the consumer who shows an ecological concern (Kinnear and Taylor, 1973; Webster, 1975) and on environmental aspects of the purchase activities of consumers (Henion, 1972; Fritzsche, 1974; Fritzsche and Duehr, 1982). Some studies have focused on the relationship between specific product attributes of environmental aspects and the purchase activities of consumers (Kerin and Peterson, 1974; Henion et al., 1980; Fritzsche and Dueher, 1982). The findings indicate that ecologically concerned consumers constitute a substantial market segment because they preferred certain product attributes for ecological reasons. There may be certain segments of the market that place a high value on the environmental dimension of products they purchase. In 1991, 49% of Americans reported that they avoided purchasing environmentally harmful products (Hueber, 1991). Despite the fact that substantial numbers of consumers claim to be "green" (Ottman, 1998), it is unclear to what extent these consumers are willing to purchase goods based solely on environmental grounds. Hume (1991) concluded from a review of studies on consumers' self-reported actions that, although many consumers say they are pro-environment, they often do not act that way. A more recent study (Mainieri et al., 1997) also reported that the respondents, though expressing generally favorable environmental viewpoints, did not display their concerns in their purchasing behavior. Only 14-30% of them stated that they had ever bought any category of products because of its environmental impact; safety to the environment ranked fourth of five factors influencing their purchase decisions.

Conclusively, a review of literature indicates that despite a high level of environmental concern among the public, this concern did not carry over to most people's

environmental buying behaviors. Thus, it is important to explore how consumers' psychological variables affect their preferences for pro-environmental attributes and consumption. The second part of this study is designed to increase understanding of people's self-reported green buying and to determine how values and attitudes predict environmentally conscious purchasing.

Culture and Environmentalism

Very few studies of the culture/environment link can be found in the United States (Arp and Kenny, 1996; Mohai, 1990; Schultz and Zelezny, 1998). However, cultural differences can not be underestimated in understanding the variability of people's forms of responses to environmental problems and issues. Culture has been used as a factor in the creation of environmental attitudes mainly to explain how and why environmental attitudes may differ between people of color and whites. A review of literature suggests three theoretical arguments explaining different environmental attitudes between people with different ethnicity (Mohai and Bryant, 1998). These explanations include (1) hierarchy of needs, (2) cultural differences, and (3) environmental deprivation. Especially, cultural differences among those three arguments will be heavily discussed here, and this is why the differences between the American and Korean subjects in their environmental attitudes and behavior can be explained best by their cultural differences. Of course, the other explanations will be also briefly stated.

The hierarchy of needs explanation is adopted from Maslow's (1954) "Hierarchy of Needs Theory" (Caron, 1989; Mohai, 1990; Taylor, 1989; Van Liere and Dunlap, 1980). According to the theory, before people can begin to focus their attention on

"higher order" needs, such as aesthetics, more basic survival needs must first be satisfied. These needs include food, shelter, and physical and economic security. From this view, a clean, aesthetic environment is seen as a higher order need (Inglehart, 1990). An individual's place in the socioeconomic order can affect the conditions in which he or she is likely to react to environmental protection. Someone whose needs for food, shelter, and physical security are barely met is not likely to spare the energy to maintain concern about higher-level needs such as clean air. It suggests that the differences between people of color and whites in terms of environmental concern can be associated with the differences in their socioeconomic status. In fact, a research by Newell and Green (1997) indicates that as blacks' income and education rise, the gap in environmental concern between blacks and whites significantly decreases.

A second explanation that may account for racial differences in concern for the environment is cultural differences (Caron, 1989; Mohai, 1990; Taylor, 1989; Vaughan and Nordenstam, 1991). According to this perspective, attitudes toward the environment are conditioned by people's cultural backgrounds and experiences. Cultural differences create a basis for differences in attitudes and behavior toward the environment. Those who differ in cultural and historical experiences may have different value systems (Pepitone and Triandis, 1988; Taylor, 1979) and a different orientation toward environmental problems (Banks, 1988; Caron, 1989; Taylor, 1989).

Beliefs and values are a critical part of culture. Hofstede (1991) defines culture as "the collective mental programming of the people in an environment." Culture is a people's way of life (Parker and McDonough, 1999), and a group of people within a culture think and act in common ways. For the purpose of understanding the word for

marketing, Rice (1993) defines culture as "the values, attitudes, beliefs, artefacts and other meaningful symbols represented in the pattern of life adopted by people that help them interpret, evaluate and communicate as members of a society." Thus, behaviors, values, beliefs, and attitudes distinguish the group from other parts of society and the country from other countries of the world. Belonging to a culture means that similar histories are shaped, and this influences the creation of values within the culture. Priorities of values vary across cultures (e.g., Grunert, Grunert, and Beatty, 1989).

According to Hofstede's work (1980), Korean and American cultures show the most contrast in individualism/collectivism and power distance dimensions of cultural programming. Briefly stated, power distance is the extent to which those of lesser status in as society accept that power is distributed unequally, and in contrast to individualism, collectivism refers to the extent to which needs and goals of the collectivity are more highly valued than individual needs and goals. Hofstede (1983) suggests that Korean culture shows large power distance and low individualism, while the United States shows small power distance and high individualism. These cultural contrasts between Korea and the United States may be assumed to affect individuals' values, which may in turn influence the subjects' attitudes toward environmental issues and decisions regarding environmental practices. McCarty and Shrum (1994) suggest that culturally oriented values might influence individuals' environmental behaviors. For instance, those who are more collectivistic tend to recycle more than those who are more individualistic because collectivistic people tend to be more cooperative and helpful and to care more for the goals of the group relative to the individual. Li (1997) also confirmed the main effects of collectivist orientation on ecological commitment.

On the other hand, there is literature evidence indicating a different result from the finding by McCarty and Shrum (1994). That is, collectivism may affect negatively individuals' attitudes toward the environment and behavior, especially through its influence on personal values. Research on collectivist versus individualist cultures demonstrates the importance of distinguishing between the universalism and benevolence value types (which are included in self-transcendence cluster) of pro-social concern (Schwartz, 1990). Members of collectivist cultures tend to show great concern for the welfare of members of their own in-group but relative indifference to the needs of outsiders. However, members of individualist cultures tend to distinguish less sharply between in-groups and out-groups when responding to their needs (Trandis, 1990; Trandis, McCusker, and Hui, 1990). This suggests that collectivist cultures put much greater emphasis on benevolence (helpful, honest, loyal) than on universalism (broad-minded, world of beauty, unity with nature, wisdom, protecting the environment) values while individualist cultures place a more equal emphasis on both value types. The motivational goal of universalism is understanding, appreciation, tolerance, and protection for the welfare of all people and for nature. This contrasts with the narrower focus of benevolence values. Benevolence focuses on concern for the welfare of close others in everyday interaction. Self-transcendence is assessed with items from universalism and benevolence. However, value items (e.g., a world of beauty, unity with nature, environmental protection) selected from universalism are particularly relevant to environmental issues. These items measure what Stern and Dietz (1994) have labeled biospherism. Also, Triandis, McCusker, and Hui (1990) show that collectivists emphasize values that promote the welfare of their ingroup, whereas individualists

emphasize values that promote individual goals. These findings indicate that value priorities held by members of group can differ across individualist and collectivist cultures.

Therefore, cultural differences might provide a basis for differences in environmental attitudes and behavior. For example, culturally oriented values such as individualism and collectivism might affect personal value orientations. In support of the concept, Rohrschneider (1990) shows that the different strengths of the environmental movement in several countries can be related to different strengths of post-material value priorities that those countries exhibit. For instance, post-material value priorities are low in France where the environmental movement is weaker but high in West Germany where the environmental movement is the strongest among four countries (Germany, France, Great Britain, and Netherlands). This evidence proposes two things: First, the differences in value priorities may cause the different levels of pro-environmental activities, and second, consumers from different countries may be distinguished by their values.

In sum, Americans and Koreans have been educated and nurtured under the influence of their unique own cultures and life situations, and such cultures and experiences might significantly affect their value priorities and their beliefs about the environment or about people's relationship with the ecological environment. These values and beliefs may influence their attitudes toward environmental problems and, further, the level of their support for environmental protection.

Finally, according to the environmental deprivation explanation, direct experience with or exposure to pollution leads to greater concern about it (Lowe and Pinhey, 1982; Van Liere and Dunlap, 1980). That is, the level of public concern for environmental

problems is related to actual levels of pollution and degradation (Tremblay and Dunlap, 1978). This environmental deprivation theory has often been used to explain rural-urban differences in support for environmental protection. According to some studies (Tremblay and Dunlap, 1978; Lowe and Pinhey, 1982), urban residents are more concerned with environmental problems and show higher levels of support for environmental protection than rural people because they are generally exposed to higher levels of pollution and other types of environmental deterioration. Second, heavy dependence on use of the natural environment by rural residents is assumed to result in less concern with environmental protection than that shown by urban residents. Murdock and Schriner (1977) suggest a third explanation: Because small towns need to maintain economic growth to survive, they are assumed to value growth over protection of environmental quality. Thus the growth orientation of rural and small-town residents, not the utilitarian orientation of farmers and other rural residents, presumably accounts for the positive relationship between environmental concern and size of place of residence. The differences between Koreans and Americans in their environmental concern and support for environmental protection can be expected and explained, in part, based on these theoretical explanations. For example, the different levels of pollution and exposure to environmental risks which exist between two countries may affect how subjects assess environmental problems. Also, the differences between subjects of two countries in whether to value economic growth or environmental protection may influence their different levels of support for environmental protection.

It is significant to examine ethnic-cultural impact on environmentalism because both ecological and cultural experiences that may be unique to a particular group can be

associated with individuals' environmental attitudes and behavior. Further, cross-cultural research on pro-environmental values, attitudes, and behavior is critical as psychologists attempt to develop models that predict behavior intended to benefit the environment.

Chapter 3

THEORETICAL FRAMEWORK

Value Theory

A value is an enduring belief that a specific mode of conduct or end-state of existence is personally or socially preferable to an opposite or converse mode of conduct or end-state of existence (Rokeach, 1973, p. 5). Values are organized into value systems. A value system is an enduring organization of beliefs concerning preferable modes of conduct or end-states of existence along a continuum of relative importance.

Values have been important variables in the study of various topics in relation to human behaviors based on the underlying belief that values guide actions and judgments across specific situations and stimuli. Values serve as standards that guide ongoing activities and value systems as general plans employed to resolve conflicts and to make decisions. Values lead us to take particular positions on social issues and predispose us to favor one particular political or religious ideology over another.

Another way to study values is to think of them as giving expression to human needs (Rokeach, 1973). Values have strong motivational components as well as cognitive, affective, and behavioral components. Instrumental values are motivating because the idealized modes of behavior they are concerned with are perceived to be instrumental to the attainment of desired end-goals. If we behave in all the ways prescribed by our instrumental values, we will be rewarded with all the end-states

specified by our terminal values. Terminal values are motivating because they represent the supergoals beyond immediate, biologically urgent goals.

Values are in the final analysis the conceptual tools and weapons that we all employ in order to maintain and enhance self-esteem. All of a person's attitudes can be conceived as being value-expressive, and all of a person's values are conceived to maintain and enhance self-esteem by helping a person adjust to his or her society, defend his of her ego against threat, and test reality. Values serving adjustive, ego-defensive, knowledge, and self-actualization functions may well be ordered along a continuum ranging from lower- to higher-order, as is suggested by Maslow's well-known hierarchical theory of motivation (1954).

Values can be used as dependent or as independent variables. On the dependent side, they are a result of all the cultural, institutional, and personal forces that act upon a person throughout his lifetime. For instance, similar values are widely held by most members of a culture or subculture. Values are derived from and modified through personal, social and cultural learning. On the independent side, they have far-reaching effects on virtually all areas of human behaviors that social scientists may consider worth investigating and understanding. A major role of values is that of a standard that individuals can use in formulating attitudes and guiding their own behavior (Clawson and Vinson, 1978).

Micro Theories of Environmentalism

A psychological component should not be missed in some models' explanation of why certain segments of society are more prone than others to support the environmental

movement. There is a group of models that emphasizes psychological factors such as values or the perception of problems in explaining public movements toward social issues. Among the most prominent psychological models are Inglehart's model of post-material value priorities (Inglehart, 1977, 1987). Other psychological approaches that have a claim to the universal explanation of human behavior include self-interest theories (Sears et al., 1980; Sears and Citrin, 1985) and sociotropic theories about public issue opinion (Kinder and Kiewiet, 1979; Kiewiet, 1983). A self-interest model argues that individuals utilize information collected from their personal lives as the major basis of issue opinions (Sears, et al., 1980). A sociotropic approach suggests that citizens support environmental organizations because they perceive the deteriorating condition of the national environment as threatening (Kinder and Kiewiet, 1979).

However, one of the most frequently discussed factors that may explain the public's support of environmental issues is post-material values. Inglehart (1977, 1987, 1989) provided empirical evidence that the rise of a material-post-material value cleavage is an important cause of the political changes observed in industrialized democracies. Post-materialists emphasize, for instance, the quality of life, alternative conceptions of security strategies, or the protection of the environment; materialists continue to focus on such issues as continued economic growth, keeping inflation rates down, or traditional security strategies. According to Inglehart, once these value priorities are shaped, individuals have acquired a broad set of values that from then on guides their perception of environmental problems, provides cues for their orientation on environmental issues, and influences their environmental behavior.

In sum, psychological models emphasize value priorities and the perception of environmental problems as the major sources of public support for environmental activities. That is, psychological theories emphasize that individuals independent of their social location may exhibit the psychological characteristics that presumably generate support for new social movement.

Schwartz's Norm-Activation Model of Altruism and the Model of Environmental Concern (Stern, Dietz, and Kalof, 1993)

Schwartz (1970, 1977) has developed a social-psychological model of altruistic behavior. According to Schwartz, the process begins with social norms regarding moral behavior upon which people generally agree in a sort of abstract, detached way. These norms represent the values and attitudes of significant others; we expect others to act in the morally proper way, and they in turn expect the same of us. However, these norms are too general and detached to govern behavior. The social norms are adopted by individuals on a personal level. That is, the social norms become personal norms. Personal norms are distinguished from social norms although they are derived from socially shared norms, because the consequences of violating and upholding personal norms are closely related to one's self-concept. In sum, social norms exist on the social structural level, whereas personal norms are strongly internalized moral attitudes (Heberlein, 1975; Schwartz and Howard, 1980).

The model suggests a critical link between personal norms and behavior. Unless the personal norms are defined as relevant and applicable to a situation, they will not be activated. Schwartz identifies two variables that influence whether or not personal norms

translate into behavior: the awareness of the consequences (AC) that action or inaction will have, and the ascription of responsibility (AR) for those consequences. When AC and AR are high, personal norms guide subsequent behavior. In short, the effect of a social norm is mediated through the personal norm, and AC and AR intervene between the personal norm and behavior. This model of norm-activation has been used mainly to study such altruistic behaviors as helping and volunteering, but the theory has been extended to individual beliefs and actions affecting environmental quality. This theoretical approach treats environmental concern as the consequence of a process of activating personal moral norms based on altruism (e.g., Hopper and Nielsen, 1991; Stern, Dietz, and Black, 1986). In this approach, environmental concerns are a subset of morally tinged human concerns, rooted in universal values.

Stern et al. (1993) extend the Schwartz's norm-activation model, which treats environmental concern as altruism toward other human beings, to incorporate both self-interest and concern with other species or the biosphere itself. They presume that the value orientation toward human welfare (altruistic motivation) is only one of at least three value orientations that might underlie environmental attitudes and behavior. The others are egoistic value orientation (self-interest) and a biospheric value orientation. Altruistic personal norms can be partially countered by the effect of perceived costs to the individual engaging in the behavior these norms prescribe (Black, Stern, and Elsworth, 1985). A biospheric value orientation indicates concern with other species and with natural environments. Stern et al. (1993) presume that action in support of environmental quality may derive from any of these three value orientations. They imply that beliefs about consequences for self or for the biosphere, and not only about consequences for

others, can motivate action on environmental issues. This perspective draws attention to different value frames, which might yield differing degrees of measured environmental concern.

Theory of A Universal Psychological Structure of Human Values

Schwartz and Bilsky (1987, 1990) proposed a tentative theory of the universal content and structure of human values, which they tested with data from seven countries. They revised that theory with numerous modifications and extensions and assessed the viability of the revised version of the theory with data gathered from 40 samples in 20 countries (Schwartz, 1992). They generated a conceptual definition of values that incorporates the five features of values recurrently mentioned in the literature. Values (1) are concepts or beliefs, (2) pertain to desirable end states or behaviors, (3) transcend specific situations, (4) guide selection or evaluation of behavior and events, and (5) are ordered by relative importance. Values differ from attitudes primarily in their generality or abstractness and in their hierarchical ordering by importance (Rokeach, 1973). In addition to the formal features of values, Schwartz and Bilsky (1987, 1990) proposed that the primary content aspect of a value is the type of goal or motivational concern that it expresses. They derived a universal typology of the different contents of values by reasoning that values represent, in the form of conscious goals, three universal requirements of human existence to which all individuals and societies must be responsive: needs of individuals as biological organisms, requisites of coordinated social interaction, and survival and welfare needs of groups. Through socialization and cognitive development, individuals learn to represent these requirements as conscious

goals and values, to use culturally shared terms to communicate about these goals and values, and to attribute varying degrees of importance to them.

The Nature of the Value Types

Schwartz (1992) identified 10 distinct motivational types that are likely to be recognized within and across cultures and used to form value priorities:

1. Self-Direction: The defining goal of this value type is "independent thought and action-choosing, creating, exploring" (p. 5).
2. Stimulation: The motivational goal of stimulation values is "excitement, novelty, and challenge in life" (p. 8).
3. Hedonism: The motivational goal of this value type is "pleasure or sensuous gratification for oneself (pleasure, enjoying life)" (p. 8).
4. Achievement: The defining goal of this value type is "personal success through demonstrating competence according to social standards" (p. 8).
5. Power: The central goal of power values is "attainment of social status and prestige, and control or dominance over people and resources (authority, wealth, social power, preserving my public image, social recognition)" (p. 9).
6. Security: The motivational goal of this value type is "safety, harmony, and stability of society, of relationships, and of self" (p. 9).
7. Conformity: The defining goal of this value type is "restraint of actions, inclinations, and impulses likely to upset or harm others and violate social expectations or norms" (p. 9).

8. Tradition: The motivational goal of tradition values is "respect, commitment, and acceptance of the customs and ideas that one's culture or religion impose on the individual (respect for tradition, humble, devout, accepting my portion in life, moderate)" (p. 10).
9. Benevolence: The motivational goal of benevolence values is "preservation and enhancement of the welfare of people with whom one is in frequent personal contact (helpful, loyal, forgiving, honest, responsible, true friendship, mature love)" (p. 11).
10. Universalism: The motivational goal of universalism is "understanding, appreciation, tolerance, and protection for the welfare of all people and for nature" (p. 12).

Dynamic Structures of Value Types

The relationships among the motivational types of values and among the single values can be summarized in terms of a two-dimensional structure. The total value structure can be viewed as composed of four higher-order value types that form two basic, bipolar conceptual dimensions.

The first basic dimension places a higher-order type combining stimulation and self-direction values in opposition to one combining security, conformity, and tradition values. They call this dimension "openness to change versus conservation."

"It arrays values in terms of the extent to which they motivate people to follow their own intellectual and emotional interests in unpredictable and uncertain

directions versus to preserve the status quo and the certainty it provides in relationships with close others, institutions, and traditions. (p.43)"

The second basic dimension places a higher-order type combining power, achievement, and hedonism values in opposition to one combining universalism and benevolence values (including a spiritual life). They call this dimension "self-enhancement versus self-transcendence."

"It arrays values in terms of the extent to which they motivate people to enhance their own personal interests (even at the expense of others) versus the extent to which they motivate people to transcend selfish concerns and promote the welfare of others, close and distant, and of nature. (p.43)"

Figure 1 represents the theoretical model of relations among motivational types of values revised to reflect what has been learned from the empirical research. These value dimensions and motivational types may be predictive of behavior that promotes the collective good in general and environmental behavior in particular.

Patterns of Value-Attitude Relations

Schwartz's (1992) model of value association can be used to predict a general pattern of value-attitude relations. The self-enhancement and the self-transcendence values are negatively related. That is, people who tend to value self-enhancement values tend not to value self-transcendence values, and people who value self-transcendence values tend not to value self-enhancement values. In addition, the self-enhancement and

self-transcendence domains are unrelated to the openness and conservation domains, which are negatively related to each other.

This pattern in the relations between values allows one to predict a pattern of relations between values and other variables (e.g., demographic statistics, attitudes) (Maio and Olson, 1995). For example, people may be favorable toward donating to charity because they consider altruism and self-transcendence values to be important. Thus, self-transcendence values may be positively related to attitudes toward donating to a charity. If this is the case, there should also be a negative relation between self-enhancement values and attitudes toward donating. This prediction is made because people who value self-transcendence should be less likely to value self-enhancement. Thus, relations between a variable and one higher-order value domain should be opposite of the relations involving the opposing domain.

Finally, value-attitude relations are stronger when people have *value-expressive attitudes* (attitudes used to express central values and self-concept) than when they have *utilitarian attitudes* (attitudes maximizing rewards and minimizing punishments obtained from the environment) (Maio and Olson, 1995). Most people's attitudes toward environmental behaviors, such as buying green, energy conservation, and joining an environmental club, are likely to be value-expressive because one's attitudes toward environmental behavior tends to express one's values and social identity. Environmental behaviors are regarded as value influenced behavior (e.g., the cost of, and opportunity for, engaging in a particular kind of behavior).

A Conceptual Model of The Present Study

Based on the importance of values in understanding consumer behavior and their relationships with other constructs such as attitudes and behavior, this study will investigate a fuller model consisting of intrinsic psychological-type determinants of pro-environmental behavior. This proposes that values influence individual's environmental attitudes and such attitudes in turn influence environmental behaviors. These links, called the value-attitude-behavior relationship, are important because these suggest that values may be meaningful to understanding behavior. But it is also important to consider these links in relation to intervening variables such as attitudes and beliefs, because there are instances that when appropriate constructs are not considered between values and behavior values seem not to have significant influences on behavior.

Values measures defined as in Schwartz's work have proved to be strong predictors of pro-environmental attitudes and behavior (Karp, 1996; Stern and Dietz, 1994; Stern, Dietz, and Kalof, 1993; Stern, Dietz, Kalof, ad Guagnano, 1995). However, most of these studies were done to find simple bivariate correlations such as the value-attitude or value-behavior relation. That is, the relationship of values to behaviors has generally not been investigated in the context of mediating variables such as attitudes. Therefore, this study will be expected to find a more extensive conceptual model (Figure 2) representing value structures as the independent variable causing the differences among individuals' environmental attitudes, which can indicate differences among consumers' environmentally sound behaviors. Additionally, PCE will be used to moderate the influence of attitudes on behavior (Figure 3).

Chapter 4

RESEARCH OBJECTIVES

The Purpose of the Study

This study's objectives are predicated on the belief that values influence behaviors directly and indirectly through attitudes and beliefs. This belief is empirically tested in the context of different cultures in order to know whether or not the relationships among the variables appear to be true within and across cultures. Based on a theory of values, attitudes, and behavior, this study investigates the roles of values in guiding environmental attitudes and behaviors (e.g., particularly buying green products and other types of pro-environmental actions in general). It also, on the other hand, tests PCE as a moderator of the relationship between attitudes and consumer behaviors. PCE and attitudes can be used more effectively as two distinct constructs in predicting environmentally conscious personal behaviors. This increases the likelihood that attitudes can predict environmentally conscious behaviors. In order to reach this goal, several objectives were developed to guide the research:

- To investigate the relationship between values and environmental attitudes
- To predict the relationship between environmental attitudes and pro-environmental behaviors
- To investigate PCE as a moderating role in the relationship between environmental attitudes and personal consumer behaviors

By achieving the goals, this study suggests a fuller model explaining a greater amount of the variance in pro-environmental behaviors. Thus, one of the objectives is the following:

- To examine the value-attitude-behavior relationship in a causal model

A second purpose of the study is to investigate the relationship between value orientations and green buying (purchase reflecting consumer's preference for environmentally sound products). As a different form of support for environmental protection, consumers' preference for environmentally sound products is tested in relation to consumer value structures. This study examines whether value orientations affect individuals' choice criteria and selection among alternatives. Consumers who strongly value self-transcendence/openness to change may have a more heightened perception of environmentally considered attributes, through their high level of environmental attitudes. Accordingly, consumers who value environmental attributes of products more highly may buy green products more often. Accordingly, some research objectives were required to find the relationships among values, attitudes, and consumerism:

- To investigate the relationship between value structures and the importance of product attributes
- To investigate the relationship between environmental attitudes and the importance of product attributes
- To predict the relationship between the importance of environmentally friendly attributes and the selection of environmentally friendly products

On the other hand, there is empirical evidence that choice criteria including environmentally considered attributes differ across countries with varying levels of

environmental sensibility. Thus, this study further proposes that people from different countries may demonstrate different valuations of environmental attributes in determining product preference. A third purpose of the study is to investigate the effects of cultural differences on value orientations and environmentally conscious behaviors including environmental consumerism. As mentioned in the literature review, countries that show different levels of public support for environmental protection also exhibit differences in strengths of postmaterial value priorities that appear to be positively related to pro-environmental behavior (Rohrschneider, 1990). Value orientations, this study presumes, may vary across cultures as well as between individuals. As noted earlier, individuals' value orientations might be affected by culturally oriented values-e.g., collectivism and individualism. Value orientations take shape during the socialization process and are fairly stable in adults. Thus, culturally distinct groups may be different with respect to their value orientations, and this difference may affect diverse responses to programs for environmental protection. This study proposes that the differences in how two countries rate self-transcendence and openness to change values may be associated with the difference in strengths of pro-environmental actions that they demonstrate. That is, this study examines whether differences between how American and Korean subjects value self-transcendence and openness to change have any impact on the differences in their engagements in pro-environmental behaviors.

Research Questions

In order to accomplish these objectives, several specific research questions are addressed.

1. Do consumers' value orientations greatly influence their environmental attitudes?
2. Do environmental attitudes influence pro-environmental behaviors (e.g., consumer's ecologically friendly purchase behavior and other environmental behaviors)? That is, do environmental attitudes mediate between values and behaviors?
3. Does PCE moderate the relationship between environmental attitudes and pro-environmental consumer behaviors?
4. Do consumers' value orientations affect their choice criteria (e.g., perceived importance of a specific product attribute)?
5. Is consumers' perceived importance of environmental attributes related to their selection of green products?

In addition, the same measurement is administered to two different ethnic-cultural groups-the U.S. and Korean subjects, under the same purpose of the study. This study explores the role of "personal values" in explaining diverse environmental concerns and behaviors that consumers demonstrate in the contexts of different cultures. The subjects from the two different countries may be considered to be different in terms of their cultural values such as collectivism, and the differences in collectivism may influence such value orientations as self-transcendence/openness to change. Finally, their value orientations would affect their attitudinal and behavioral reactions to environmental issues. It is interesting to examine whether culturally distinct subjects may exhibit different strengths with respect to their value orientations and also show different levels

of environmental behavior. Therefore, this study has some research questions regarding cross-cultural circumstances.

6. Will value orientations affect individuals' pro-environmental behavior through their influence on environmental attitudes within and across cultures?
7. Do the U.S. and the Korean subjects exhibit differences in their collectivism and in the value orientations measured by the Schwartz's Values Scale? Do their value orientations influence their pro-environmental behaviors? In other words, can the differences in their value priorities regarding self-transcendence/openness to change values explain the differences in their engagements in pro-environmental behaviors?
8. Do the U.S. and the Korean subjects differ in their environmental consumerism?

Research Hypotheses

Several hypotheses are presented based on the above research questions. They test the theoretical implications of my model. Hypothesis one examines how value orientations can influence attitudes toward the environment. Hypothesis two examines how attitudes toward the environment influence pro-environmental behaviors. Hypothesis three examines how PCE moderates the relationship between environmental attitudes and behavior. Hypothesis four examines the value-attitude-behavior model within and across cultures. Hypotheses five, six, and seven examine how value orientations and attitudes can impact the importance of environmental attribute among product features, and ecologically considered choice. Hypotheses eight and nine examine how cultural differences influence individuals' value orientations and their

environmentalism-that is, pro-environmental behaviors, the importance of pro-environmental attributes, and green buying. Especially, in the hypothesis eight, collectivism was related to the value orientations identified by the Schwartz's value measurement and the performance of pro-environmental behavior.

First, the way value structures provide a basis for environmental attitudes is hypothesized employing the Schwartz's Values Scale:

- H_1: The value structures will be related to environmental attitudes.
- H_{1a}: Self-Transcendence/Openness to change will be positively related to environmental attitudes.
- H_{1b}: Self-Transcendence/Conservation will have no significant relationship with environmental attitudes.
- H_{1c}: Self-Enhancement/Openness to change will have no significant relationship with environmental attitudes.
- H_{1d}: Self-Enhancement/Conservation will be negatively related to environmental attitudes.

The study presumes that attitudes are the product of a variety of variables including an individual's underlying value structures. The individual's values can operate to influence attitude formation. Thus, individuals' value orientations would significantly influence their concerns and decisions about the environment. Specifically, three types of values (egoistic, altruistic, and biospheric values) might provide bases for environmental concern and influence environmental action (Stern and Dietz, 1994). The Schwartz's value measures reflect these values on which environmental concern is based. That is, self-enhancement values are similar to egoistic value orientations, and the self-transcendence cluster to social-altruistic value orientations. The self-transcendence cluster also included all three items that seem to reflect a biospheric value orientation. Thus, it includes both altruistic and biospheric value orientation. For instance, people who place values such as "broad-minded" and "unity with nature" (which, according to

Schwartz, are self-transcendence and openness to change values) at the top of their hierarchy would be more likely to choose the environmentally protective behavior through their favorable attitudes toward the environment, whereas people who pursue the values weighted on economic, security, and material desires-like a comfortable life (e.g., self-enhancement and conservation values)-would tend to select options satisfying such needs regardless of environmental protection, because they tend to be environmentally less conscious (have less favorable attitudes toward the environment). However, a self-transcendence/conservation and a self-Enhancement/openness to change value structures are assumed not to have significant relationship with environmental attitudes based on the previous evidence (e.g., Karp, 1996).

H2: Environmental attitudes will be positively associated with Pro-environmental behaviors. That is, higher levels of environmental attitudes will be related to greater pro-environmental behavior.

Environmental attitudes have correlated with behaviors, although the strengths of attitude-behavior correlation can vary depending on the nature and measurement of each of the variables. Consumers with favorable attitudes toward the environment will be more likely to perform a number of environmentally conscious behaviors.

When considering a moderator variable, PCE, affecting the association between attitudes and behavior, it is hypothesized that:

H3a: Perceived consumer effectiveness (PCE) will moderate the relationship between environmental attitude and pro-environmental behaviors. That is, the relationship between environmental attitudes and pro-environmental behaviors will be stronger for individuals with high PCE than for those with low PCE.

As noted, the relationship between environmental attitudes and behaviors can also be examined by using a moderator variable perspective. A moderator variable can be

defined as any variable that systematically affects the association between a predictor and a criterion variable (Berger and Corbin, 1992). While an attitude represents a summary evaluation of an individual's beliefs or feelings about an issue, PCE represents an evaluation of the self in the context of the issue. Accordingly, attitudes and PCE can be modeled separately (Ellen, Weiner, and Cobb-Walgren, 1991). Berger and Corbin (1992) supported empirically the proposition that PCE moderates the degree of attitude-personal consumer behavior relationship. They found significantly higher correlations between attitudes and consumer behaviors for high PCE groups relative to low PCE groups. When modeling PCE as a moderator of the relationship between attitudes and consumer behavior, attitude-behavior correlations may be expected to be high when PCE is high and low when PCE is low. For instance, if a group of individuals is very concerned about the state of the environment but is convinced that only big business, government, or in general "others" can produce effective solutions, these individuals may show low levels of pro-environmental consumer behaviors.

Also, several studies show that feelings of PCE have significant impact on the behavioral measure that represents specific acts of personal responsibility (e.g., consumer behaviors such as buying green, use of car pool or public transit, avoidance of environmentally harmful products, and recycling) (see Ellen, Weiner, and Cobb-Walgren, 1991; Berger and Corbin, 1992).

H3b: Perceived consumer effectiveness (PCE) will positively affect the engagement in pro-environmental behaviors.

Although Berger and Corbin (1992) propose perceived consumer effectiveness as moderators of the attitude-behavior relationship, and test them as such in their analyses,

they also recognized that they may operate as direct effects. Ellen et al. (1991) found a direct effect of PCE on environmentally conscious behaviors. However, as mentioned in previous literature, PCE was a significant predictor for certain behavioral measures while environmental concern was significantly related to all behaviors. Therefore, PCE should be studied to find what specific types of pro-environmental behaviors, not generalized pro-environmental behaviors, can be predicted by PCE.

H4: The value-attitude-behavior model will be meaningfully supported. That is, individuals who strongly value Self-Transcendence/Openness to Change will be more concerned about environmental problems and thus engage more in environmentally conscious behaviors.

An indirect influence of values on pro-environmental behavior via attitudes providing a mediating role will be tested. The results may build a conceptual model describing the relationships among those variables. That is, this research will consequently investigate whether individuals' value structures are significantly related to their different levels of environmental consciousness and thus to the differences in their pro-environmental behaviors.

For the second part of the model, which is predicting the relationship between value orientations and environmental consumerism, some hypotheses can be suggested:

H5: The value structures will be related to consumers' perceived importance of environmental attributes. That is, consumers who strongly value Self-Transcendence/Openness to change will consider the environmental attribute of product features to be more important than those who strongly value Self-Enhancement/Conservation.

Consumer value structures have been shown to directly influence the importance of product attributes in making purchase decisions. Consumers with similar values will show similar choice criteria and final behavior. Therefore, consumers who significantly

value self-transcendence and openness to change can be differentiated from those who value self-enhancement and conservation in evaluating the importance of environmental attributes of product features.

H6: Consumers with environmentally favorable attitudes will consider the environmental attribute to be more important than will those with environmentally unfavorable attitudes.

Individuals with favorable attitudes toward the environment will be intrinsically motivated to attend to the environmental attributes of products. Research by Kinnear and Taylor (1973) identified differences in perception of detergent brands among respondents who indicated different degrees of environmental concern. Value structures are expected to influence choice criteria salience within a product category through their impact on attitudes toward the environment. In other words, environmentally conscious consumers will be assumed to use different choice criteria in selecting brands than will environmentally less conscious consumers due to their different beliefs and attitudes toward environmental issue based on their different value orientations. As a result, consumers will be more likely to buy ecologically considered products.

H7: Consumers who consider the environmental attribute to be more important will be more likely to buy ecologically friendly products.

Brands perceived as having higher levels of these salient attributes are more likely to be liked by the individual and will be the ones having highest probability of selection in the market. Conversely, the brands least favored will have the lowest probability of selection.

As mentioned previously, this study will have the chance to see the effects of cultural differences on environmentalism by surveying subjects from two different

countries. Korean subjects are considered to have different ethnic and cultural backgrounds from U.S. subjects. Especially, the two groups show contrasts in collectivism-individualism and power distance. In relation to environmentalism, collectivist and individualist cultures might influence individuals' environmental attitudes and behavior (McCarty and Shrum, 1994; Schwartz, 1990). This cultural difference may also affect their value orientations. According to Schwartz (1990), people of collectivist and individualist cultures may tend to show differences in preferring self-transcendence values (see literature review for details). It can be proposed that differences in valuing the self-transcendence/openness to change dimensions may cause different levels of environmental attitudes and behaviors.

In any culture, individual values will fall along a dimension of self-enhancement (e.g., values oriented toward the pursuit of self-interest) to self-transcendence (e.g., values related to a concern for the welfare of others) (Schwartz, 1992). However, cultural differences may affect individuals' value orientations or the strengths of their value orientations. There is evidence that support for environmental protection is consistently and strongly related to specific values, such as social-altruism and biospheric values. This can result in different levels of environmental attitudes and pro-environmental behavior. Therefore, the study hypothesizes that:

H8a: The U.S. and the Korean subjects will be significantly different in terms of the extent to which they value Self-Transcendence/Openness to Change.

H8b: The U.S. and the Korean subjects will be significantly different in terms of their engagements in pro-environmental behavior.

The form of response to environmental protection can vary across countries. Especially, it will be interesting for international marketers to investigate the differences in consumer's preference to environmental attributes of product features.

H8c: The U.S. and the Korean subjects will significantly differ in the importance they attach to a product's environmental attributes.
H8d: The U.S. and the Korean subjects will significantly differ in their purchases of environmentally considered products.

The marketing literature provides convincing evidence that consumers across different cultures indeed differ in unexpected and sometimes subtle ways. Sriram and Forman (1993) empirically tested and found that choice criteria differ across the Dutch and American samples with varying degrees of sensibility regarding environmental factors. While consumers across two countries (i.e., the United States and Korea) may agree on the need for environmental protection, these consumers may very well differ in their responses to environmental consideration. Particularly, U.S. and Korean subjects may differ in the importance of a product's environmental attributes in relation to its other features in consumer preference and choice criteria.

Finally, as mentioned in the literature review, an investigation regarding the relationship between collectivism and pro-environmental behaviors is needed. This relationship was argued by McCarty and Shrum (1994), and Schwartz (1990). In order to understand the relationship between collectivism and behavior, it may first be examined how preference for collectivism influences people's value orientations.

H9a: Individuals' collectivism will affect their value priorities.
H9b: Individuals' collectivism will affect their performance of pro-environmental behavior.

Chapter 5

METHODOLOGY

Samples

Data were collected from a sample of American and a sample of Korean respondents. In each case, the sample was selected using a non-probability, convenience sample. When considering the nature of the study and practical difficulties due to surveying subjects from two different countries, college students were recommended. The use of college students controls variations on some variables such as age and education which might affect the relationships of the variables of interest.

A total of 581 university undergraduate students studying in the United States (n=306) and Korea (n=275) participated in this research. The American sample consisted of college students who were enrolled at Michigan State University, and the Korean sample was drawn from students enrolled at Chongju University in Korea. For comparability, students were considered in terms of their demographic variables and geographic factors such as the location of school and residence.

Research Design and Procedure

Given the difficulty of studying actual consumer choice behavior, this study chose to conduct a survey of subjects. The data were collected through self-reported questionnaires which were completed in the presence of the researcher or the collaborators. The questionnaire was constructed in English and translated into Korean

using native Korean speakers who were also fluent in English. The questionnaire was "back-translated" into English to ensure its accurate translation.

This self-administered questionnaire largely consisted of five sections divided by the kinds of the variables. Questionnaires were distributed to students who were participating in classes on campus.

Variables Measures

a. *Value measurement*: Subjects completed a version of Schwartz's (1992) Value Survey shortened because of space constraints. The 22 values chosen for the shortened survey were selected based on three studies (Maio and Olson, 1995; Schultz and Zelezny, 1998; Stern, Dietz, and Guagnano, 1998), which also selected items based on Schwartz's (1992, 1994) two-dimensional representation of the values indicated by samples from various countries. I selected the 22 values which appeared most frequently in the three value measurements. The value items appeared to be most centrally located and occurred most frequently in each of Schwartz's 10 primary domains. In the survey, respondents were asked to rate each value following these instructions: "Please indicate how important each of these is as a guiding principle in YOUR life." The rating was made using a seven-point scale with the end points labeled "extremely important" and "not important at all."

b. *Environmental attitudes measurement*: The 12-item New Environmental Paradigm (NEP) scale (Dunlap and Van Liere, 1978; Noe and Snow, 1989-1990) was used to assess environmental attitudes. Van Liere and Dunlap's (1978) NEP scale is one of the best developed measures of environmental concern in the existing literature. The

scale was often used as a measure of general pro-environmental attitudes. For the NEP scale, a standard 7-point Likert response format was employed. The end points were labeled "strongly agree" and "strongly disagree", the midpoint "completely neutral."

c. *Perceived consumer effectiveness (PCE)*: As a moderating variable in the relationship between environmental concern and behavior, PCE was measured by using seven items: four items indicating more general and broad PCE (i.e., "I feel capable of helping solve the environment problems.") and three for PCE specific to environmentally conscious behavior (i.e., "I can protect the environment by buying products that are friendly to the environment."). The statements measuring general PCE have been used to measure PCE in previous studies (Ellen, Wiener, and Cobb-Walgren, 1991; Berger and Corbin, 1992; Lee and Holden, 1999). Respondents were asked their level of agreement/disagreement with Likert-type statements on a 7-point scale.

d. *Individualism/collectivism*: In a separate part of the value measurement, ten items that were expected to tap collectivism were measured on a 1 to 5 scale from "not at all important" to "extremely important." In this research, collectivist orientation was assessed in terms of priority of group goals, perceived importance of unity with nature, and harmony with others (Yamaguchi, 1990), which could reflect collectivism.

e. *Salient product attributes (choice criteria)* : To measure the relative importance of environmental attributes among the product attributes in consumer preference and choice decisions this study chose three low-cost consumer nondurables: laundry detergent, toilet paper, and fruits and vegetables. There were some reasons to select low cost, consumer nondurable products. First, this study wanted to minimize

subjects' involvement with the product. Consumers' choice criteria may vary depending on their involvement with the products. In fact, a study (Sriram and Forman, 1993) demonstrated different results depending on product class, that is, whether the product was of a high or low involvement. For more expensive and less frequently purchased products like washing machines, consumers who might be environmentally conscious placed less importance on a product's environmental attributes. The financial and other features involved in the decision seemed to be a moderating influence. However, for relatively inexpensive and frequently purchased products like deodorants, consumers placed a lot of value in a product's environmental attributes. Therefore, relatively inexpensive and frequently purchased products like laundry detergent seemed to be more appropriate to see respondents' sensibility to the environment through assessing the importance placed in a product's environmental attributes. Secondly, the respondents should have a good knowledge of the alternatives and attributes. By this criterion, the chosen products were appropriate. Finally, the usage of these products was related to environmental protection, as each impacted ecological pollution. Household nondurables such as laundry detergent frequently appeared in green advertisements, which added realism to the task (Iyer, Banerjee, and Gulas, 1993). A study by Mainieri et al. (1997) reported that the one category in which the greatest number of respondents had based their purchases on environmental impact was laundry detergent (30%), followed by household cleaners (29%), paper products (29%), garbage bags (17%), light bulbs (14%) and other products (9%). Although fruits and vegetables were not mentioned in the study, this product category seemed to be appropriate in considering the product's environmental

friendliness. Recently, consumers have been presented with a variety of organic products in the grocery. The number of stores which sell organic foods has been increasing and becoming more popular among customers. The questionnaire contains possible attributes of each product offered by several brands. The product attributes were generated by collecting terms used to advertise and describe the features of the products. For each of the three products, eight factors that influence consumer preference and purchasing were selected. Table 1 describes the attributes used for each product. The respondents were presented with these attributes for each product and asked both to rate each feature in terms of its importance to him/her in selecting a brand of this kind and to rank them from 1 ("most preferred") to 8 ("least preferred"). For rating, a 5-point Likert response format was used with the end points labeled "strongly important" and "strongly unimportant."

f. *Product involvement*: To analyze the relative importance of product attributes, it was first necessary to measure consumer involvement to the products in question. Generally speaking, high-involvement consumers demonstrate a greater interest in information search and attribute comparison and show a greater perceived brand difference and a stronger brand preference (Zaichkowsky, 1985) than do low-involvement consumers. Consumer involvement was measured by the Product Involvement Inventory (PII) (Zaichkowsky, 1985). Zaichkowsky's personal involvement inventory has been proved useful and widely used. This study used a reduced form consisting of 10 items (Zaichkowsky, 1994) based on Zaichkowsky's 20 items because of the length of the overall questionnaire and the tedium imposed on survey respondents. The scale ranged from a low score of 10 to a high score of 70. As

an additional check for the subject's relationship with the object, the study asked who usually bought the product.

g. *Previous behavior toward environmentally friendly products*: Environmental consumerism like purchasing ecologically considered products is one type of pro-environmental behavior. The data concerning consumer purchase behavior toward environmentally friendly products were collected by presenting three statements based on three products (e.g., laundry detergent, toilet paper, and fruits and vegetables), i.e., "I make a special effort to buy vegetables and fruits grown without pesticides or chemicals, also known as organic fruits and vegetables," "I make a special effort to buy toilet paper that are made from recycled materials," and "I make a special effort to buy detergents and cleansing solutions that are environmentally friendly." The items used for this study were prepared based on some previous studies measuring environmental behavior (e.g., Maloney, Wards, and Braucht, 1975; McKenzie-Mohr, Nemiroff, Beers and Desmarais, 1995; Roberts, 1996). The respondents were asked to report the frequency with which they perform the activities included in the questions along a 5-point scale: "never" (1), "rarely" (2), "sometimes" (3), "often" (4), "always" (5).

h. *Previous pro-environmental behavior*: Dunlap (1991) identifies two major types of pro-environmental behaviors: those that focus on individual responsibility and those that emphasize political action. Individual changes in lifestyle include such things as ecologically responsible consumer choices, recycling, and energy-saving behaviors. Political behaviors include voting decisions, letter writing, consumer boycott, and contributing money to, or volunteering for, environmental organizations. While the

literature generally supports the conclusion that broad values and attitudes are predictive of specific ones, it also suggests that the most important social-psychological factors depend on the type of behavior. For instance, the predictors of support for political action may be different from those of pro-environmental consumer behavior. Therefore, this study tried to link various types of pro-environmental behavior as well as ecologically conscious buying behavior to values in order to clarify the role of values in predicting environmental behavior. A scale for pro-environmental behavior measurement was created by including broad types of environmental behavior, such as participating in some actions to save energy, attending a meeting of an organization concerned with environmental protection, buying environmentally friendly brand, recycling, and signing a petition for tougher environmental law, to protect the environment. These items were developed based mainly on two aspects of environmental actions: consumer and political activity. Those items have been considered to be reliable and appropriate to measure people's commitments for ecological improvement (Maloney, Ward, and Braucht, 1975; Stern, Dietz, Kalof, and Guagnano, 1995; McKenzie-Mohr, Nemiroff, Beers and Desmarais, 1995; Roberts, 1996; Karp, 1996). The respondents were asked to report the frequency with which they had engaged in several environmental activities over the year. These items were measured along a 5-point scale: "never" (1), "rarely" (2), "sometimes" (3), "often" (4), "always" (5).

i. *Demographic information of respondents:* Subjects' basic demographic profiles including the type of residence were asked in order to better understand subjects.

Analysis

For the purpose of analyzing collected data, various statistic methods were employed. A factor analysis was used to reduce the 22 value items and the 18 pro-environmental behavior items into underlying constructs. Regressions, correlation, t-tests, and structural equation model with AMOS 4 were conducted to test the hypotheses. The tests used 95% confidence intervals and a .05 level of significance.

Chapter 6

RESULTS AND DISCUSSION

Demographic Profile of the Respondents

The respondents ranged in age from 18 years to 51 years, with the mean age of 20.6 years for the U.S. group. Forty percent of the U.S. respondents were male and 60% were female. Ethnic identification doesn't show much variance: 82.3% reported themselves as White and 17.7% as other racial categories (2% for Asian/Pacific Islander, 11.7% for Black, 1.3% for Chicano/Hispanic, and 2.7% for other). At MSU, 71.8% of the respondents were studying in the departments of the school of communication arts and sciences (i.e., Advertising and Public Relations and Telecommunication).

For the Korean group, age ranged from 18 years to 29 years, with a mean age of 21.6 years. Forty percent of the Korean respondents reported themselves as male and 60% as female. Differently from the U.S. group, the Korean group consisted of one race (i.e., Asian). At Chongju University, most of them (74%) were studying at the departments of the school of communication arts and sciences (i.e., Advertising and Public Relations, and Communication).

These measures showed very small variations across countries. Subjects across the two countries were quite similar in terms of their age, major, and the ratio of male to female. The only significant variation was in type of residence. For the U.S. group, 34.8% lived on campus (e.g., dormitory) and 65.2% lived off campus. For the Korean group, only 4.1% lived on campus and 95.9% lived off campus. This can be explained by

the residential situations of each country's campus. Generally Korean universities don't provide as many dormitories as the U.S. universities do. Only a few of students who need housing near the campus can be accommodated in a dormitory on campus. The rest of them reside off campus, for example, in a boarding house or rented room.

Descriptive Findings

Values measured by Schwartz's Value Items

Schwartz's value items are arrayed in two dimensions: one dimension indicates the degree of concern for welfare of others (self-transcendence) and the pursuit of self-interest (self-enhancement), and the other dimension reflects the degree to which individuals are motivated to independent action and willing to challenge themselves for both intellectual and emotional realization (openness to change vs. conservation). To analyze the structure of values and to assess the impact of these values on environmental attitudes and pro-environmental behavior through the attitudes, a factor analysis was first conducted. A quartimax rotation was used to test Schwartz's two-dimensional theory of values, because a quartimax rotation emphasizes dominant factors, minimizing the number of interpretable factors needed to explain the structural relationship of the 22 value items. Thus, the obtained large factors ought to correspond to the quadrants of the two Schwartz dimensions.

In the quartimax rotation, for the U.S. subjects, 6 factors received eigenvalues greater than 1; but for the Korean subjects, 5 factors were extracted according to eigenvalues greater than 1. These factors have two or more high loadings (greater than .4) that do not load on other factors. These factors are reported in Tables 2-2 and 2-3.

Two factor analyses were performed separately by country. They produced different number of factors, and factors consisting of somewhat different value items. This phenomenon might be considered to be due to cultural differences between the two countries. The U.S. subjects seemed to be closer to Schwartz's theory of values than the Korean subjects. That is, the value factors obtained from the U.S. sample corresponded more closely to each quadrant of Schwartz's two dimensions (see figure 1) than those from the Korean sample. Table 2-1 lists the Schwartz value items measured in this study and their relationship to the two dimensions and 10 motivational types. Thus, further statistical analysis should be done separately by country to respect the outcomes obtained from factor analysis.

As Stern et al.'s studies (1993, 1995) indicated, the factor analysis of the U.S. subjects yielded six dimensions, including a factor reflecting biospheric values distinct from altruistic values for people in general. Each of these factors can be compared to a quadrant of these two dimensions (i.e., Schwartz's dimensions of Self-Transcendence versus Self-Enhancement, and Openness to change versus Conservation). These comparisons were used in a previous study (Karp, 1996) and helped interpretation of each factor for values. Factor 1 consists of 6 items with loadings greater than .4; all of these value items are self-transcendence value items and conservation items. Therefore, this factor is interpreted as Self-Transcendence/Conservation (TC). Factor 2 consists of 3 items. All items (100%) are self-enhancement items. All items (100%) are openness to change items. This supports a Self-Enhancement/Openness to Change (EO) interpretation. Factor 3 consists of three items; two (67%) are self-enhancement items and two (67%) are openness to change items. This is a Self-Enhancement/Openness to

Change II (EOII) factor based on "achievement" of Schwartz's 10 motivational types, while factor 2 is based on a motivational type called "stimulation." Factor 4 consists of 2 value items, which are included in a self-transcendence/openness to change quadrant but are specific to environmental values such as biospheric values. This factor, consisting of "unity with nature" and "protecting the environment" items, measures what Stern and Dietz (1994) have labeled biospherism. The biospheric values indicate altruism for ecology independently from altruistic values for people (such as "equality" and "freedom"). Such values were also found to be loaded separately from altruistic values for people in other previous studies (Stern et al., 1993, 1995). This factor is interpreted as an ecology subtype of Self-Transcendence/Openness to Change (TOE). Factor 5 consists of three items, which are included in self-transcendence/openness to change. The factor indicates altruistic values for people, and it is named a general subtype of Self-Transcendence/Openness to Change (TO) factor. Finally, factor 6 consists of two items; both (100%) self-enhancement items and both (100%) conservation items. This factor represents Self-Enhancement/Conservation (EC).

For the Korean subjects, five value factors were obtained; each of them can also be compared to a quadrant of Schwartz's dimensions of Self-Transcendence vs. Self-Enhancement, Openness to Change vs. Conservation. Factor 1 consists of 6 items; 4 items support a quadrant of Self-Transcendence/Conservation (TC) but two items-"protecting the environment," and "unity with nature"-represent an ecological subtype of Self-Transcendence/Openness to Change (TOE). Interestingly, those biospheric values were not loaded independently, as the U.S. subjects showed. For the Korean subjects, the biospheric value items were loaded with other value items measuring Self-

Transcendence/Conservation in a same value factor. This result demonstrates that according to the subjects, the biospheric values can be located in a different quadrant that Schwartz presents based on his theory of human value structures. This factor is named a combination of Self-Transcendence/Conservation and an ecological subtype of Self-Transcendence/ Openness to change (TCE). Factor 2 includes three items; all of them indicate a Self-Enhancement/Openness to change (EO) factor. Factor 3 consists of four items; three items were included in a quadrant of Self-Enhancement/Conservation and one item in a Self-Enhancement/Openness to change quadrant. This factor supports a Self-Enhancement/Conservation (EC) interpretation. Factor 4 consists of two items; both (100%) are self-transcendence and openness to change items. This factor is called a general type of Self-Transcendence/Openness to change (TO). Finally, factor 5 consists of three items; using Schwartz's two dimensions, two (67%) are self-transcendence items and two (67%) are openness to change items. Thus, this is called a Self-Transcendence/Openness to change II (TOII) factor to distinguish it from factor 4.

Environmental Attitudes

The New Environmental Paradigm (Dunlap and Van Liere, 1978) was shown to have good internal validity with both the U.S. and the Korean sample. However, it also demonstrated that cross-cultural research could have difficulty in translating several of the items (Noe and Snow, 1990). Reliability coefficients for the 12-item scale were calculated separately for each country. The alpha coefficients were .80 for the United States and .67 for Korea. Means and standard deviations for environmental attitudes, calculated separately by country, are listed in Table 3.

A t-test to see any significant difference in environmental attitudes indicated that the U.S. subjects were less environmentally concerned than the Korean subjects were ($t = -4.808$, $p = .000 < .01$).

Individualism/ Collectivism

Previous literature used culturally oriented values such as individualism/collectivism as independent measures in explaining a variety of attitudinal and behavioral variables. A few studies have examined the effect of collectivism on pro-environmental behavior like recycling (e.g., McCarty and Shrum, 1994). Also Schwartz (1990) implied the possibility that value priorities exhibited by individuals can be influenced by the individuals' individualistic or collectivistic inclination. That is, individualists are likely to put more emphasis on value items (e.g., protecting the environment and unity with nature) based on a motivational value type such as "universalism" than are collectivists. Therefore, it is interesting to explore the effect of individualistic or collectivistic values on personal value orientations and proenvironmental behavior. Specifically, American and Korean cultures show the most contrast in individualism/collectivism. It is expected that this contrast may affect the value priorities that the subjects from the two countries exhibit. Ten items on the respondent's collectivism were asked, and the average score of the ten items were obtained to compare the means of the two independent groups. Reliability coefficients for the 10-item scale were .59 for the U.S. subjects and .74 for the Korean subjects.

A t-test to see whether the U.S. ($N = 304$) and Korean ($N = 272$) sample are different in terms of individualism showed that there is no significant difference between the two groups in their individualism ($t = .355$, $p = .723 > .05$). The mean difference

between the U.S. sample (M = 3.44, SD = .51) and the Korean sample (M = 3.42, SD = .62) was very small. This result supports evidence that there appears to be a shift from collectivism to individualism in many parts of the world (Triandis, McCusker, and Hui, 1990). The major determinant of this shift is affluence. Fast industrialization and economic growth in Korea have brought materialistic affluence, along with changes in the method of making a living (away from the agricultural method) and social mobility; all of these have contributed to individualism. Exposure to programs produced in individualistic cultures through the modern mass media has also contributed the shift from collectivism to individualism. This transition has weakened the cultural contrast of individualism vs. collectivism between the U.S. and the Korean sample.

Perceived Consumer Effectiveness (PCE)

PCE was measured by 7 items, which included ones for general PCE and ones for specific PCE stating particular behavior. For the U.S. group, the coefficient alpha was .76 for all seven items, the reliability coefficient for only general PCE items was .69, and the reliability coefficient for particular PCE items .74. For the Korean group, the coefficient alpha was .70 for all items, .60 for three items reflecting general PCE, and .73 for four items of particular PCE. Based on the coefficients, the scale measuring PCE is pretty reliable and the four items for particular PCE seem more reliable than the items for general PCE. The means and standard deviations for PCE items and scale were calculated separately by country and summarized in Table 4

Environmental Behaviors

The 18 environmental behavior items in the questions were reduced to underlying constructs by factor analysis with a varimax rotation. Four factors were obtained after

varimax rotation. These factors are reported in Table 5, along with means and standard deviations of each item and summary means for each factor, calculated separately by country. No item had a factor loading greater than .4 on more than one factor. This factor analysis enabled the researcher to construct four dependent variables: a factor-based score of the political-behavior items (α = .73 for the U.S. sample and α = .74 for the Korean sample); a factor-based score of the energy-saving behavior items (α = .64 for the U.S. sample and α = .60 for the Korean sample); a factor-based score of the green-buying behavior items (α = .82 for the U.S. sample and α = .72 for the Korean sample); and a factor-based score of the recycling-behavior items (α = .68 for the U.S. sample and α = .69 for the Korean sample). These dependent variables are simple mean scores of the individual responses to each item with a factor loading of .4 or higher on the corresponding factor.

A composite behavioral score as a general measure of proenvironmental behavior was also generated by averaging the 18 environmental behavior items, and a reliability analysis was performed separately for each country. In the U.S. the alpha reliability was .87, and in Korea the alpha reliability was .84. The composite measure of proenvironmental behavior was used as a dependent variable with the other four behavioral measures (political, energy-saving, green-buying, and recycling behaviors).

Product Involvement

To assess the extent to which a subject perceives the object in question as personally relevant based on inherent needs, values, and interests (Zaichkowsky, 1985, p. 342), subjects were asked to answer the items in Zaichkowsky's Personal Involvement Inventory (PII). Not all cases are considered to have the scores of PII. Respondents who

didn't buy the product in question for their own use were dropped from consideration for further assessments. That is, only subjects who reported "I" usually buy laundry detergent, toilet paper, or fruits and vegetables for "myself" were assessed to examine the relationships between the importance of environmental attributes and buying green.

Consumers' involvements with each of the three products measured by Zaichkowsky's PII can be reported by country (see Table 6). For the U.S. subjects, fruits and vegetables showed the highest product involvement (N = 185, M = 56.75, SD = 8.1), followed by toilet paper (N = 153, M = 45.71, SD = 7.23) and laundry detergent (N = 168, M = 42.82, SD = 8.31). For the Korean subjects, very similar findings were obtained; that is, fruits and vegetables also demonstrated highest product involvement (N = 113, M = 55.15, SD = 10.82), and toilet paper (N = 135, M = 52.0, SD = 7.19) and laundry detergent (N = 114, M = 45.52, SD = 6.64) took the second and the third place.

To test the significant differences between the two national groups in terms of product involvement, t-tests were performed and the results indicated that the product involvement with laundry detergent (t = -3.018, p value = .003) and toilet paper (t = -7.386, p value = .000) were significantly different between the Korean group and the U.S. group. The Korean group showed greater product involvement with the two products than the U.S. group. However, the Korean group and the U.S. group were not significantly different in their involvement with fruits and vegetables (t = 1.357, p value = .176).

The Relative Importance of the Environmental Attribute

As mentioned earlier, eight variables that seem to influence consumer's preference and decision were included and measured by using rating and ranking

methods. Among the eight product attributes for each of three products, one is relevant to environmental issue, for instance "nonpolluting ingredient (e.g., biodegradable)" for laundry degergent, "made from recycled paper" for toilet paper, and "organically grown" for fruits and vegetables. To assess respondents' preference to such environmental attributes, both ranking and rating methods were employed. Only subjects that identified "me" or "myself" as the person in their households who usually bought the object in question were considered for the further statistical analysis. The means, standard deviations, and ranks according to the mean size are presented in Table 7.

According to the mean scores obtained from rating measurement, in case of fruits and vegetables "freshness" was the most preferred among the 8 product attributes across the two groups. Environmental attributes such as "organically grown" were ranked 6th according to the subjects' preference. In the case of laundry detergent, the Korean subjects chose "removal of tough stains" as the most important attribute and "nonpolluting ingredient" as the 7^{th} most important one out of the eight attributes. The U.S. subjects considered "price" to be the most important and "nonpolluting ingredient" to be the least important among the 8 product features. Finally, in the case of toilet paper, the U.S. sample also rated "price" to be the most important attribute when selecting a brand to buy and "made from recycled paper" to be the least important one. The Korean sample selected "softness" as the most important attribute and "made from recycled paper" as the least important one. The "price" attribute was ranked second most important for the Korean subjects, while the "softness" attribute was ranked second most important for the U.S. subjects. Very similar preferences for each product attribute were obtained across the two groups and across the two methods used to measure the

preference of each attribute. Although the number of consumers who demonstrate a willingness to buy environmentally considered products has been increasing, this study has noted that the environmental attributes were still less preferred by consumers in comparison to other quality- or price-oriented attributes. This is consistent with the previous market research indicating that consumers, despite their concern with environmental protection, are still extremely price-sensitive when it comes to buying green.

Predictors of Pro-environmental Behavior and Relations among the Predictor Variables

The Relationship Between Values and Environmental Attitudes (H_{1a} - H_{1d}):

As predicted, regression analysis for the U.S. subjects revealed a significant positive relationship between the ecology subtype of Self-Transcendence and Openness to Change (TOE) values (i.e., biospheric values) and environmental attitudes (Beta = .428, t = 7.381, p value = .000 < .01) and between Self-Transcendence/Openness to change (TO) values and environmental attitudes (Beta = .154, t = 2.530, p = .012 < .05). But it revealed nonsignificant relationships for the other four value factors. That is, Self-Transcendence/Conservation (H_{1b}), Self-Enhancement/Openness to Change (H_{1c}), and Self-Enhancement/Conservation (H_{1d}) values respectively have no significant relationship with environmental attitudes. Especially, the relationship between Self-Enhancement/Conservation (EC) values and environmental attitudes was negative as hypothesized, although it was not statistically significant (Beta = -.104, t = -1.957, p = .051 > .05).

Regression analysis for the Korean subjects also showed a significant positive relationship between a Self-Transcendence/Conservation value factor including the biospheric value items (e.g., TCE) and environmental attitudes (Beta = .425, t = 6.392, p = .000 < .01). The relationships between the other value factors (e.g., TO, TOII, EO, and EC) and environmental attitudes were not significant. Specifically, Self-Transcendence/Openness to Change, indicating altruistic values toward other people (TOII and TO), was not significantly related to environmental attitudes for the Korean subjects, while the relationship for the U.S. subjects was significant. The relationship between Self-Enhancement/Conservation (EC) and environmental attitudes was not significant but negative as well (Beta = -.085, t = -1.415, p = .158 > .05). The analytical results are presented in Table 8.

This finding implied that an ecology subtype of self-transcendence/openness to change values (i.e., biospheric values) would be more likely prodictive of pro-environmental attitudes than a general type of self-transcendence/openness to change values. A significant positive relationship between a general type of Self-Transcendence/Openness to change (TO) values, indicating altruism for people, and environmental attitudes was shown only among the U.S. samples. This result shows a similarity to the study by Schultz and Zelezny (1998), which investigated a relationship between value structures and pro-environmental behavior. The results from five countries show a positive relationship between biospherism, the nature subtype of self-transcendence, and pro-environmental behavior. Results for the self-transcendence scale (consisting of items selected from benevolence, except biospherism) showed a significant positive effect only among the U.S. sample.

In addition, the Self-Enhancement/Conservation (EC) factor showed insignificant negative relationship with environmental attitudes (H_{1d}) across the two samples (i.e., the Korean subjects and the U.S. subjects). In general, the hypotheses for the specific relationships between value structures and attitudes toward the environment were supported for the U.S. subjects while they were partially supported for the Korean subjects. The findings suggest that biospheric values, particularly the ecology values within Self-Transcendence/Openness to Change, play an important role in determining environmental attitudes within and across countries. In addition, the analyses showed a negative relationship between Self-Enhancement/Conservation (EC) values and environmental attitudes, although it failed to reach conventional levels of statistical significance.

The Relationship between Environmental Attitudes and Pro-environmental Behavior (H_2): First, environmental attitudes measured by the NEP scale were correlated with a composite score of 18 pro-environmental behaviors separately by country. The correlations, as predicted, revealed a significant positive relationship between environmental attitudes and pro-environmental behavior. Pearson correlations by country showed that attitude was significantly correlated with pro-environmental behavior (for the U.S. subjects, $r = .386$, $p = .000 < .01$; for the Korean, $r = .201$, $p = .001 < .01$) at the .01 level. However, as mentioned previously, the strengths of relationship between environmental attitudes and pro-environmental behavior may vary according to different types of pro-environmental behavior. Thus, the four specific types of pro-environmental behaviors (e.g., energy-saving, green-buying, political, and recycling behavior) obtained after a factor analysis could be used as four dependent variables instead of one composite

measure of pro-environmental behavior. These analyses might provide explanations about what types of pro-environmental behaviors are most popular among environmentally conscious consumers. The correlations matrix between environmental attitudes and four pro-environmental behavior factors is summarized in Table 9.

For the U.S. subjects, attitudes toward the environment were significantly related to each of the four types of pro-environmental behaviors at the .01 level. Therefore, the more individuals are environmentally conscious, the more they engage in various pro-environmental behaviors. When considering correlation size, the correlation size between attitudes and green-buying behavior ($r = .377$, $p < .01$) was biggest, followed by energy-saving behavior ($r = .304$, $p < .01$), political behavior ($r = .216$, $p < .05$), and recycling behavior ($r = .213$, $P < .05$).

For the Korean subjects, the correlations between attitudes toward the environment and the three types of pro-environmental behavior–except for political behavior–were positively significant at the .01 level. Interestingly, political behavior showed a significant negative relationship with environmental attitudes ($r = -.145$, $p = .017 < .05$). That is, the more individuals are environmentally conscious, the less they engage in political activities such as writing a letter to the government supporting a sound environment. This unexpected result may be inferred by considering the nature of political actions. For example, even though people are environmentally concerned they may prefer to selectively engage in the specific types of pro-environmental behaviors instead of all kinds of pro-environmental behaviors. Especially personal types of pro-environmental behaviors were popular because they could be effectively performed under individual responsibility. However, political actions such as writing a letter to the

government must be collective to be effective. Thus people who are environmentally concerned may be more inclined to personally performed behavior than political actions. They may not expect greatly that political actions can help environmental problems. As another possibility, measurement error can be taken into count. For the ecologically concerned Korean subjects, recycling behavior was most frequently performed ($r = .237$, $p < .01$), and energy saving ($r = .212$, $p < .01$) and green buying behavior ($r = .168$, $p < .01$) were followed.

In general the hypothesis describing the association of environmental attitudes with pro-environmental behavior was significantly supported. That is, the findings showed that general environmental concern was a predictor of pro-environmental behavior in both cases (the U.S. and the Korean sample). The strengths of the relationship between attitudes and behavior, however, were various according to the types of pro-environmental behaviors. For the U.S. subjects, the more they are ecologically concerned the more they make efforts to buy ecologically considered products; for the Korean subjects, the more they are ecologically concerned the more they do recycling.

Moderating Effects of Perceived Consumer Effectiveness (H_{3a}):

This hypothesis was tested by subgroup analysis (Arnold, 1982). For the moderator variable of PCE, the sample was first sorted in ascending order. Next, the top and bottom 30% of the cases were selected in order to obtained two subgroups reflecting high and low score on the moderator variables. The middle 40% of the cases were omitted to improve the contrast between the subgroups. Pro-environmental behavior was then regressed on environmental attitudes using all cases in the two subgroups (restricted run). A second regression was performed, this time allowing the regression coefficient

estimates to take on different values across the two subgroups (unrestricted run). The difference in the sums of squared residuals from the restricted and unrestricted regression runs was incorporated in the Chow test (Chow, 1960) to assess the statistical significance of the differences in the regression coefficient of environmental attitudes across the high and low subgroups. The same procedures were performed for two different groups by country, and analytical results were obtained.

For the U.S. subjects, when a composite measure of pro-environmental behavior is the dependent variable, the difference in the regression coefficients across the two subgroups reflecting high and low PCE is statistically significant ($F [2,201] = 4.51$, $p < .05$). The tabled critical value is 4.61 for 1% significance and 3.00 for 5% significance. This finding supports the prior expectation that an individual's perceived consumer effectiveness moderates the effect of his or her environmental concern on pro-environmental behavior. With regard to pro-environmental behaviors, the regression coefficient for environmental attitudes is .36 in the high PCE group versus .31 in the low PCE group. This finding suggests that a unit change in environmental attitudes has a stronger impact on pro-environmental behavior of people with high PCE than on that of people with low PCE. This result supports H_{3a} and the expectation that people with high level of PCE would show greater relationship between pro-environmental attitudes and behavior than those with low level of PCE.

When each of the four types of pro-environmental behaviors was used as a dependent variable, the difference in the regression coefficients across the two subgroups by high and low PCE was significant for green-buying [$F (2,201) = 3.88 < .05$]. When green-buying behavior was the dependent variable, the coefficient for attitudes toward the

environment was .42 ($p < .01$) for people with high PCE and .32 ($p < .01$) for those with low PCE. This finding suggests that environmentally concerned people with high PCE are more likely to buy ecologically considered products than people with low PCE. However, for political behavior the difference in the regression coefficients across high and low PCE groups was not statistically significant [$F(2,201) = .41 > .05$], although the coefficient for environmental attitudes of subjects with high PCE (Beta = .26, $p < .01$) was statistically significant but not significant for subjects with low PCE (Beta = .08, $p > .05$). In contrast to expectation, for energy saving and recycling behavior, people with low PCE are more likely to make steps to save energy and participate in recycling than people with high PCE. When energy saving is a dependent variable, the regression coefficients for attitudes are .18 for high-PCE people and .32 for low-PCE people, and when recycling behavior is a dependent variable, the coefficients for attitudes are .20 for high-PCE people and .22 for low-PCE people. The difference in the regression coefficients across the two subgroups according to the levels of PCE is statistically significant [$F(2.201) = 5.62 < .01$ for energy saving; $F(2,201) = 4.50 < .05$ for recycling]. This suggests that the influence of environmental attitudes on energy saving and recycling behavior is stronger for people with low PCE than for people with high PCE. In sum, perceived consumer effectiveness (PCE) moderates the effect of environmental attitudes on pro-environmental behaviors except for political behavior, but the effects of environmental attitudes on a composite measure of pro-environmental behavior and green buying behavior are stronger for people with high PCE, and the effects of the attitudes on energy saving and recycling behavior are stronger for people with low PCE. The moderating effects of PCE are summarized in Table 10.

For the Korean subjects, when the general measure of pro-environmental behavior is the dependent variable, PCE also appears to moderate the impact of attitudes toward the environment on pro-environmental behavior [$F(2,147) = 6.39 < .01$]. The coefficients for environmental attitudes are .30 ($p < .05$) for people with high PCE and -.07 ($p > .05$) for people with low PCE. The moderating effect of PCE on the relationship between attitudes and behavior was also found when each of the four types of pro-environmental behaviors was a dependent variable. The effects of environmental attitudes on the four types of pro-environmental behaviors were significantly different across the PCE subgroups: for energy saving [$F(2,147) = 5.26 < .01$], for green buying [$F(2,147) = 9.57 < .01$], for political behavior [$F(2,147) = 4.95 < .01$], and for recycling [$F(2,147) = 5.38 < .01$]. The effects of environmental attitudes on a general measure of pro-environmental behavior and the four types of pro-environmental behaviors are significantly stronger for people with high PCE than for those with low PCE. While the U.S. group provided inconsistent findings about the moderating effects of PCE on the relationship between attitudes and behavior, the Korean group demonstrated findings consistent with the expectation that environmentally concerned subjects with high PCE are more likely to engage in certain types of pro-environmental behavior as well as general pro-environmental behavior. As Table 10 indicates, however, when a composite measure of pro-environmental behavior and green buying behavior are the dependent variables, the moderating effect of PCE is most obvious. That is, in cases of energy saving and recycling behavior, the regression coefficients of environmental attitudes are not statistically significant across the two subgroups reflecting high and low PCE, even though the difference in the coefficients across the two subgroups is statistically

significant. When political behavior is the dependent variable, the regression coefficient for environmental attitudes is .10 ($p > .05$) in the high PCE group versus -.34 ($p < .01$) in the low PCE group. That is, the subgroup with high PCE showed an insignificant but positive relationship between environmental attitudes and political activities, but the subgroup with low PCE showed a significant but negative relationship between the two variables. The difference in the regression coefficients across the two subgroups according to the levels of PCE is statistically significant. These findings may suggest another role as well as the moderating one of PCE. That is, considering an attitudinal construct like PCE when investigating the relationship between attitudes and behavior may improve understanding of the relationship. For instance, when examining the relationship between environmental attitudes and political behavior without considering PCE among the Korean subjects, the relationship was unexpectedly negative and significant. However, the relationship between environmental attitudes and political behavior became different when considering PCE. That is, the environmentally concerned subjects who showed high level of self-efficacy in improving environmental problems reacted positively to political actions although the participation was not statistically significant. However, the subjects with low self-efficacy in improving environmental problems were very negative in engaging in political behaviors towards a better environment in spite of their concern about the environment. Thus, it is concluded that the consideration of PCE may help explain the direction as well as the strength of the relationship between attitudes and behavior.

In short, the analytical findings from the two multinational groups support H_{3a}– that PCE moderates the effect of attitudes toward the environment on pro-environmental

behavior. Generally speaking, individuals with higher level of perceived consumer effectiveness engage in pro-environmental behavior in general, and in particular, purchase green products more often.

The Relationship between PCE and Personal Pro-environmental Behaviors (H3b):

Previous research (Berger and Corbin, 1992; Weiner and Doescher, 1991; Robert, 1996; Lee and Holden, 1999) indicates that consumers' levels of PCE do affect their likelihood of engaging in ecologically conscious consumer behaviors. This study also empirically supports the relationship between PCE and personal pro-environmental behavior. That is, an individual's belief that he or she can make a difference in solving an environmental problem significantly influences his or her willingness to engage in a specific action designed to improve the ecological environment.

The correlations for the relationships between PCE and the four types of pro-environmental behaviors across two multinational groups showed that while environmental attitudes were significantly related to all behaviors, PCE was not correlated to political behavior (see Table 11). Further, the influences of environmental attitudes and PCE on pro-environmental behaviors were examined by employing a regression analysis. The result also indicated that PCE was a significant predictor for three of the four behavioral measures–that is, energy saving, green buying, and recycling behavior. The regression coefficients of PCE and environmental attitudes on the four types of pro-environmental behaviors are listed in Table 11-1. Greater perceived consumer effectiveness was associated with greater likelihood of engaging in consumer behaviors such as buying green, energy saving, and recycling actions.

This result is consistent with those of some previous studies (e.g., Ellen et al., 1991) that indicate PCE has a great impact on the behavioral measure that represents specific acts of personal responsibility. The individual's belief that he or she can make a difference affects his or her performance of individually oriented activities such as buying ecologically considered products, limiting consumption of energy, or recycling. However, PCE was not a significant predictor of political behavior like contributing money to improve the environment, attending a meeting, or writing a letter to the government for the environment. Perceived consumer effectiveness appears to be a significant factor in explaining acts of personal discretion but not in explaining actions aiming at the effect of groups. This is not consistent with Lee and Holden (1999), whose results showed that PCE did not significantly predict low-cost consumer activities (e.g., seeking out green products, avoiding harmful packaging, or taking public transit). They found that PCE is a significant predictor of high-cost consumer behaviors (e.g., contribution to or being a member of an environmental group, writing to the government about the environment, or attending a meeting on environmental issues).

The Value-Attitude-Behavior Model

Test of the Value-Attitude-Behavior Model (H_4):

The proposed model was tested to indicate how the predictors of pro-environmental behavior are related one another; that is, how they influence pro-environmental behavior. It was also assessed if the predicted relationships among the variables vary with the two national groups. The proposed structural equation model was tested with AMOS 4, using the two-step model-building approach that tests the

measurement model before examining the hypothesized structural linkages (Anderson and Gerbing 1988). A measurement model that included latent constructs was first analyzed. The missing data were treated with listwise deletion of cases, and the final sample size of 574 was used for analysis (N = 304 for the U.S., and N = 270 for the Korean).

Table 12 presents correlations of all latent constructs in the measurement model, and Table 13 reports the factor loadings for each latent variable. The goodness-of-fit indices indicated a good fit of the measurement model: $\chi^2 = 87.093$, d.f. = 51, p = .001; GFI = .951; AGFI = .931; NFI = .937; CFI = .972; RMSEA = .048 for the U.S. sample / $\chi^2 = 94.973$, d.f. = 74, p = .051; GFI = .953; AGFI = .933; NFI = .904; CFI = .977; RMSEA = .032 for the Korean sample.

Next, the hypothesized paths were estimated. The predicted relationships from values to environmental attitudes and from the attitudes to pro-environmental behaviors were found significant ($p < .01$) for both the U.S. and the Korean groups. As expected, values positively influenced environmental attitudes (standardized path coefficient = .569, p = .000 with the U.S. subjects; standardized path coefficient = .505, p = .000 with the Korean subjects). The environmental attitudes, in turn, exerted a positive influence on pro-environmental behaviors both with the U.S. sample (standardized path coefficient = .437, p = .000) and with the Korean sample (standardized path coefficient = .435, p = .000). The parameter estimates for the models are reported in Table 14.

Furthermore, the goodness of fit indices showed that the proposed model with the relationships among the values, attitudes, and behaviors had good fit with the data with both the U.S. and the Korean subjects, although the chi-square statistics were still

significant for the U.S. sample (χ^2 = 99.704, d.f. = 52, p = .000, GFI = .949, AGFI = .924, NFI = .927, CFI = .963, RMSEA = .055 for the U.S. group / χ^2 = 94.973, d.f. = 74, p = .051, GFI = .953, AGFI = .933, NFI = .904, CFI = .977, RMSEA = .032 for the Korean group).

To assess the possible direct influence of values on pro-environmental behaviors, a model with an additional path from values to behaviors was tested. With the U.S. subjects, values were found to have a direct, positive influence on the pro-environmental behaviors (standardized path coefficient = .278, p = .001). Interestingly, with the Korean subjects, values did not appear to have a significant, direct effect on the behaviors (standardized path coefficient = .178, p > .05). The chi-square values for the two models were compared to evaluate the contribution of the direct relationship from values to behavior to the model fit with the data. With the U.S. group, the direct path from values to behaviors improved the model fit significantly ($\chi^2_{\text{difference}}$ = 12.611, d.f. = 1, p < .01), whereas the improvement in fit with the model including the path was marginally significant for the Korean sample ($\chi^2_{\text{difference}}$ = 4.181, d.f. = 1, p > .05).

Consequently, this study supports the value-attitude-behavior relationship within a causal model approach across the two national groups (see Figures 4 and 5). That is, a value factor consisting of the biospheric value items positively affects environmental attitudes and in turn, the attitudes influence pro-environmental behavior. For example, the individuals who put a greater importance on the ecological values are more environmentally conscious and based on such environmental consciousness engage in pro-environmental behavior more often.

The Relationship between Values and the Importance of Environmental Attribute (H5):

To understand the relationship between the value structures and environmental consciousness in a more practical way, this hypothesis was tested. Several tests were performed due to the different types of products and the two different groups surveyed. First, for the U.S. subjects, six value factors were regressed on a specific environmental attribute according to three different products. Table 15 presents the results of the analysis for the three products.

As predicted, an ecology subtype of Self-Transcendence/Openness to change (TOE) (i.e., biospheric values) showed a significant positive relationship with the importance of environmental attributes for laundry detergent (Beta = .252, t = 4.037, p = .000 < .01), for toilet paper (Beta = .326, t = 5.304, p = .000 < .01), and for fruits and vegetables (Beta = .218, t = 3.543, p = .000 < .01). The other value structures (e.g., TO, TC, EO, EOII, and EC), however, failed to show a significant relationship with the importance of environmental attributes of laundry detergent and toilet paper. The importance of environmental attribute such as "organically grown" for fruits and vegetables appeared to be significantly related to a Self-Enhancement/Openness to change II (EOII) values (Beta = .188, t = 2.809, p = .005 < .01) and a Self-Transcendence/Openness to change (TO) values (Beta = .137, t = 2.119, p = .035 < .05).

For the Korean subjects, the summary of the regression analysis for the three products is presented in Table 16. A Self-Transcendence/Conservation factor including the biospheric values (TCE) showed a significant positive relationship with the importance of each environmental attribute of the three products (e.g., Beta = .390, t = 5.604, p = .000 < .01 for laundry detergent, Beta = .251, t = 3.573, p = .000 < .01 for toilet paper, and Beta = .333, t = 4.825, p = .000 < .01 for fruits and vegetables). The

other four value factors (i.e., TO, TOII, EC, and EO) were not significantly related to any environmental attributes for the three products.

In sum, the results indicated that consumer value structures could predict the importance of environmental attributes. That is, consumers who strongly hold biospheric values considered an environmental attribute of the product feature to be important. Significant relationship was found between certain values (e.g., biospherism) and the importance of an environmental attribute.

Relations between the Predictor Variables and Greenness

The Relationship between Environmental Attitudes and the Relative Importance of Environmental Attribute (H6):

To test the hypothesized relationship, correlations were measured between individuals' environmental attitudes and their perception of the importance of environmental attributes. The results are summarized in Table 17. The obtained correlations for the U.S. subjects showed that the environmental attributes for two products such as laundry detergent ($r = .280$, $p = .000 < .01$) and toilet paper ($r = .279$, $p = .000 < .01$) were significantly correlated with individuals' environmental attitudes. However, in case of fruits and vegetables, the environmental attribute was not significantly related to individuals' environmental attitudes ($r = .108$, $p = .061 > .05$). This insignificant relationship can be interpreted somewhat by the U.S. subjects' involvement with the product (i.e., fruits and vegetables). There is evidence that for product with a high involvement, compared to that with a low involvement, consumers tend to place less importance on a product's environmental attributes although they are

environmentally conscious (see Sriram and Forman, 1993). The two national groups of this study showed highest involvement with fruits and vegetables among the three products measured, and the U.S. sample's involvement with the product was a little higher than the Korean sample's one.

For the Korean group, the correlations indicated that the subjects' environmental attitudes were significantly related to the three environmental attributes for the three products measured. That is, consumers who are more environmentally conscious considered the environmentally favorable attributes to be more important than those who are less environmentally conscious. Across the two groups, a significant positive relationship was found between the subjects' attitudes toward the environment and the importance of environmental attributes for the two products such as laundry detergent and toilet paper. But for fruits and vegetables the results were mixed across the two different groups.

The Relationship between the Importance of Environmental Attribute and Buying Green (H7):

To test the hypothesis that individuals who consider the environmental attribute to be more important would be more likely to buy ecologically friendly products, three items were measured in relation to the three products and were used as three dependent variables. For instance, in case of laundry detergent, the importance of "nonpolluting ingredient" for individuals was correlated to how often they buy household chemicals such as laundry detergents and cleansing solutions that are environmentally friendly. For toilet paper, the importance of "made from recycled paper" was correlated to the extent to which individuals make a special effort to buy paper products like toilet paper that are

made from recycled materials. Also, for fruits and vegetables, the importance of an environmental attribute like "organically grown" was correlated to the extent to which respondents make a special effort to buy fruits and vegetables grown organically. Before correlations were performed, some cases were filtered according to the answer to the question "who usually buys such product in your household." Only the cases that reported "me" or "myself" as a person who usually bought the product in question were included for statistical analysis.

The correlations obtained for each of the two groups generally indicated that individuals who evaluate environmental attributes more highly would buy ecologically considered products more frequently. The importance of environmental attributes for the subjects was significantly related to their frequency of making efforts to buy green products in the categories of laundry detergent (for only the U.S. subjects) and toilet paper and fruits and vegetables (for both the U.S. and the Korean subjects). The analytical findings are summarized in Table 18.

The findings for the U.S. sample indicated a significant positive correlation between the importance of environmental attributes and buying-green behavior for the three products. These significant relationships were found among the Korean sample as well, for the two products besides laundry detergent ($r = .176$, $p = .055 > .05$). Although the Korean subjects failed to show a significant correlation between the importance of environmental attributes and the purchase of ecologically considered product in case of laundry detergent, the two groups supported the hypothesis for the other two products, indicating a significant relationship between the variables. That is, individuals who

considered environmental attributes to be more important were more likely to buy ecologically considered products.

Effects of Ethnicity on Pro-environmental Consciousness

Impact of Ethnicity on Valuing Self-Transcendence/Openness to Change (H_{8a}):

This hypothesis examined whether the Korean and the U.S. subjects are different in the extent to which they value Self-Transcendence/Openness to change. To test this hypothesis, the researcher constructed new scores based on each value structure according to the Schwartz value theory, because each value factor obtained from a factor analysis performed separately by country consisted of slightly different value items, which makes the comparison of the two groups difficult. The 22 value items, according to the value items' relationship to the two dimensions and 10 motivational types indicated by Schwartz (see Table 2-1), were used to generate five value structures regardless of factor analysis: a Self-Transcendence/Conservation, a general type of Self-Transcendence/Openness to change, an ecology subtype of Self-Transcendence/Openness to change, a Self-Enhancement/Conservation, and a Self-Enhancement/Openness to change. While Schwartz did not divide a Self-Transcendence/Openness to change (TO) value into an ecology subtype (i.e., biospheric values) and a general subtype of TO, this study did so because the other previous studies (e.g., Stern et al. 1993, 1995; Schultz and Zelezny, 1998) as well as this study produced and emphasized biospheric values (called an ecology subtype of self-transcendence/openness to change) independently from a general type of self-transcendence/openness to change values.

A t-test of each of the five value structures between the two separate groups, presented in Table 19, supports the hypothesis. That is, the U.S. and the Korean group were significantly different in valuing an ecology subtype of Self-Transcendence/Openness to change ($t = -3.049$, $p = .002$) and in valuing a general Self-transcendence /Openness to change ($t = 4.178$, $p = .000$). The Korean subjects ($M = 5.30$, $SD = 1.08$) value an ecology subtype of Self-Transcendence/Openness to change more strongly than the U.S. subjects do ($M = 5.01$, $SD = 1.21$). The comparison of mean scores by two groups indicated that the Korean subjects put more emphasis on an ecology subtype of Self-Transcendence/Openness to change than the U.S. subjects do. However, the U.S. subjects ($M = 6.19$, $SD = .59$) more strongly valued a general type of Self-Transcendence/Openness to change than the Korean subjects do ($M = 5.95$, $SD = .71$).

Impact of Ethnic Difference on Pro-environmental Behavior (H_{8b}):

This study tests the hypothesis that the Korean and U.S. group will be different in their pro-environmental behaviors based on the proposition that their value structures especially, among several plausible factors affect their engagements in pro-environmental behavior. The results of t-tests of pro-environmental behavior for each group are presented in Table 20.

As hypothesized, subjects from the U.S. and Korea were significantly different in their general measure of pro-environmental behavior ($t = -1.99$, $p = .047$) and in three out of four types of pro-environmental behavior; that is, green buying behavior ($t = -1.974$, $p = .049$), energy saving behavior ($t = -2.44$, $p = .015$), and recycling behavior ($t = 2.54$, $p = .011$). However, subjects were not significantly different in political behavior ($t = .536$, $p = .593$). That is, the Korean subjects engaged more in proenvironmental behavior than

the U.S. subjects, and especially they showed a higher level of participation in green buying and energy saving than the U.S. subjects. The U.S. subjects appeared to engage more in recycling than the Korean subjects did.

Impact of Ethnic Difference on the Importance of Environmental Attributes (H_{8c}):

This hypothesis tests empirically the proposition that the U.S. and the Korean sample are different in their evaluation of environmental attributes included in product features when they decide their product preference. The t-tests between the U.S. and the Korean subjects regarding the importance of environmental attributes provided supporting evidence that consumers from different countries might be different in their preferences related to environmental considerations. The importance of each environmental attribute for the three products was significantly different for the two national groups. That is, the Korean subjects attached more importance than the U.S. subjects did to the environmental attributes of laundry detergent ($t = -5.369$, p value = .000), toilet paper ($t = -2.177$, p value = .030), and fruits and vegetables ($t = -3.860$, p value = .000). The results of the t-tests are presented in Table 21.

The Impact of Ethnic Difference on Buying Green Products (H_{8d}):

This hypothesis examines the influence of ethnic difference on environmental consumerism. Environmental, or "green" consumerism is a purchasing choice that expresses a preference for less environmentally harmful goods and services (Sriram and Forman, 1993). The results of t-tests are presented in Table 22. In accordance with H_{7d}, the Korean subjects made more efforts to buy organically grown fruits and vegetables than the U.S. subjects did ($t = -6.294$, $p = .000 < .01$). However, in cases of laundry

detergent and toilet paper, the two national groups were not significantly different in their purchases of environmentally considered brands.

Effects of Collectivism on Value Structures and Pro-environmental Behavior

The Relationship between Collectivism and Value Priorities (H_{9a}):

The proposition that value priorities can be influenced by the individual's collectivism was tested by regressing collectivism on each value structure. The results (presented in Table 23) indicated that collectivism was significantly related to Self-Transcendence/Conservation values (Beta = .26, p = .000 for the U.S. subjects; Beta = .21, p = .001 for the Korean subjects) across the two groups. Furthermore, the U.S. subjects showed that collectivism was not significantly related to an ecology subtype of Self-Transcendence/Openness to change values (Beta = .061, p = .291) and a general type of Self-Transcendence/Openness to change (Beta = .065, p = .260). The Korean subjects also indicated that collectivism was not significantly related to a general type of Self-Transcendence/Openness to change (Beta = .09, p = .138), but was significantly related to an ecology subtype of Self-Transcendence/Openness to change (Beta = .15, p = .013).

The Relationship between Collectivism and Pro-environmental Behavior (H_{9b}):

Unlike the previous study by McCarty and Shrum (1994), this study showed an insignificant relationship between collectivism and pro-environmental behavior across the two groups by country. Furthermore, the U.S. subjects demonstrated negative insignificant relationship with five dependent variables: a general measure of pro-environmental behavior (Beta = -.085, p = .135); energy saving (Beta = -.039, p = .497); green buying (Beta = -.083, p = .148); political behavior (Beta = -.052, p = .362); and

recycling behavior (Beta = -.082, p = .155). The Korean subjects showed insignificant relationship with the five dependent variables according to the types of pro-environmental behaviors as well, but negative relationship was found only between collectivism and political behavior. The results are summarized in Table 24.

Summary of Results and Discussion

The goal of this study was to determine values as fundamental bases of environmental attitudes and behavior and to suggest a conceptual model to better understand the antecedents of pro-environmental behavior across cultures. Furthermore, this study investigated the links between psychological variables–such as values and attitude– and green consumerism. These investigations explored the possibility of building a causal relationship between the attitudinal variables and buying-green behavior. This study also examined the impact of cultures and cultural values on the respondents' environmental behavior.

According to the model suggested in this study, an individual's value orientations can affect his or her attitudes toward the environment and participation in pro-environmental behavior. This study proposed that certain value structures were more likely to result in greater concern about the environment, which in turn might lead a subject to take part in behavior designed to address the environmental problems. Furthermore, this study proposed that individual expectations of perceived consumer effectiveness (PCE) impacted the attitude-behavior relationship, resulting in different levels of engagement in pro-environmental behavior.

Impact of personal value structures on environmental attitudes. The results tend to support the hypothesis of this study that value structures influence attitudes toward the environment. The researcher factor analyzed the value items separately by country and found a six-factor solution (for the U.S. sample) and a five-factor solution (for the Korean sample) that corresponded somewhat to the value clusters reported by Schwartz. Regression analyses revealed a significant positive relationship between biospherism (i.e., the value items from self-transcendence/openness to change that are specific to the natural environment) and pro-environmental attitudes, but nonsignificant relationships for the other value structures. Furthermore, the results of this study indicate that the biospheric value items can be loaded on a different value dimension corresponding to the quadrants of the two Schwartz dimensions (Self-Transcendence vs. Self-Enhancement and Openness to change vs. Conservation) according to the two national groups. That is, the two value items (for example, "protecting the environment" and "unity with nature") were loaded independently from other value items that are supposed to be included in a Self-transcendence/Openness to Change quadrant in case of the U.S. sample. However, in case of the Korean sample, these two biospheric value items were loaded into a factor with other items within a Self-Transcendence/Conservation quadrant. This finding could be explained by cultural differences. Cultures may influence the perspectives toward the environment the two national groups have formed. Especially, the Korean subjects tend to consider the ecological environment as an object that they should respect and honor rather than one that they should protect. Their beliefs and attitudes toward the influence that ecological nature has on people's lives might influence their perspectives toward the environment and the issues like environmental protection. Therefore, the biospheric

values can be accepted by the Korean subjects as important guiding principles in their lives as much as other traditional ethical values such as "honest", "helpful", and "honoring parents and elders."

Consequently, two regression analyses by country were performed in order to see the relationship between value structures and environmental attitudes, and the two groups supported the hypotheses that personal value structures may affect attitudes toward the environment. Specifically, biospheric values within self-transcendence/openness to change quadrant were positively related to environmental consciousness. It seems likely that biospheric values (i.e., altruistic values for nature) are more predictive of environmentalism than general altruistic values for other people in a self-transcendence/openness to change quadrant. In addition, a Self-Enhancement/Conservation value factor was negatively related to individuals' environmental concern, although the relationship was not statistically significant. These findings suggest that values, particularly the ecology items within a self-transcendence/openness to change quadrant, play an important role in determining environmental consciousness. Altruistic value orientations (toward the welfare of others and nature) positively influence subjects' environmental concern. Egoistic value orientations (toward self-interest) tend to negatively influence environmental concern.

Impact of environmental attitudes on pro-environmental behavior. This study proposed that more environmentally concerned subjects were more likely to engage in pro-environmental behavior. Furthermore, environmental attitudes may affect a broad range of pro-environmental behavior. The results support this hypothesis. As predicted, subjects who were environmentally concerned were more likely to engage in pro-

environmental behavior across cultures. Specifically, the U.S. subjects who showed positive attitudes toward the environment engaged in various types of pro-environmental behaviors and appeared to be most active in buying ecologically considered products among them. The Korean subjects were also more likely to participate in various types of pro-environmental behaviors, except for political behavior, based on their greater concern about the environment, and they were most active in recycling.

Moderating impacts of PCE on the attitude-behavior relationship. H_{3a} was supposed to investigate the moderating effects of perceived consumer effectiveness (PCE) on the relationship between attitudes toward the environment and pro-environmental behavior. Consistent with previous studies (e.g., Berger and Corbin, 1992), this study found that PCE moderates the strength of the attitude-behavior relationship. That is, subjects with high PCE showed a significantly stronger relationship between environmental attitudes and pro-environmental behavior than those with low PCE did, across cultures. But when each of the four types of pro-environmental behaviors was used as a dependent variable, while the U.S. sample indicated that PCE moderated the degree of relationship between environmental attitudes and green buying behavior, the Korean sample showed that PCE moderated the degree of relationship between environmental attitudes and green buying, energy saving, and political and recycling behaviors. These results indicate that PCE is a very influential moderator of the environmental attitude-consumer behavior relationship for the Korean sample. The contestable moderating effects of PCE for the U.S. sample imply the possibility that PCE may have differential influences on the form of the relationship between attitudes and behaviors according to the types of pro-environmental behaviors.

Consequently, the results of this investigation provide evidence that perceived consumer effectiveness is an important variable in explaining the relationship between environmental attitudes and personal consumer behaviors such as green-buying behavior. An individual's self-perception of his or her efficacy in struggling with environmental problems clearly influences whether or not he or she will act on these environmental concerns in the marketplace. Moreover, the results from the U.S. sample indicate that the influence of such efficacy may be significantly different in different behavioral situations.

Impact of PCE on personal environmental behaviors. Perceived consumer effectiveness (PCE) was examined as a supplementary predictor of pro-environmental behaviors. PCE significantly predicted three environmentally conscious consumer behaviors–energy-saving behavior, green-buying behavior, and recycling–but it did not significantly predict political behavior across the two national groups.

While environmental attitudes were significantly related to all behaviors, PCE was a significant predictor for only three of the four behavioral measurements; i.e., green buying, energy saving, and recycling. A consumer's perceived self-efficacy is likely to be more of an issue for relatively individually oriented behaviors than for political behavior such as contributing money to improve the environment or writing a pro-environment letter to the government, which are predicated on the effect of groups. In short, greater perceived consumer effectiveness was associated with greater likelihood of engaging in such individual behaviors. Finally, based on analytical findings concerning the impacts of attitudes and PCE, this study has implied the importance of treating pro-environmental behavior as a variable in future research. That is, this study provided evidence that the relationship between attitudinal variables and pro-environmental behavior could be

different due to the kinds of pro-environmental behaviors being measured. Thus, future research should measure a specific type of pro-environmental behavior rather than a pro-environmental behavior in general, in order to indicate significant predictors of pro-environmental behavior in a better manner.

The causal relationship of environmental variables in predicting pro-environmental behavior. The results of the proposed conceptual model using structural equation model with AMOS 4 indicated the positive effects of value structures on environmental attitudes and of environmental attitudes on pro-environmental behavior. These significant links between environmental variables were found across the two national groups. That is, this study found that personal value structures play an important role as fundamental bases in guiding an individual's attitudes toward the environment, and finally his or her actual behavior. Especially, the results for the Korean sample suggest an indirect effect of values on pro-environmental behavior, emphasizing the importance of mediating constructs such as environmental attitudes between values and pro-environmental behavior. Previous studies (e.g., Karp, 1996; Schultz and Zelezny, 1998) examined only the direct relationship between values and behavior or attitudes and behavior. This study has extended the past studies by incorporating attitudes between the link of values and behavior, and suggested that the effects of values on behavior may not seem salient unless one considers a mediating variable like attitudes or beliefs.

Impact of values on the perceived importance of environmental attributes. Subjects' value priorities were supposed to affect the importance they attached to a given environmental attribute included in product features. As hypothesized, the U.S. subjects that strongly valued an ecology subtype of Self-Transcendence/Openness to Change

(biospheric values) perceived environmental attributes as more important across the three products. The Korean subjects that strongly valued a Self-Transcendence/Conservation including the biospheric value items perceived environmental attributes as more important across the three products. Consequently, subjects' value priorities were found to be linked to the importance of product attribute. That is, consumers with altruistic values for nature considered an environmentally friendly attribute to be an important factor when purchasing products.

Impact of environmental attitudes on the perceived importance of environmental attributes. This study found that environmentally more concerned subjects tend to perceive environmental attributes (especially when selecting laundry detergent and toilet paper) as more important than do environmentally less concerned subjects. However, in the case of fruits and vegetables, the results were mixed across the two national groups; that is, while the U.S. subjects failed to show a significant relationship between environmental attitudes and the perceived importance of the environmental attribute (e.g., organically grown), the Korean subjects showed a positive significant relationship between environmental attitudes and the perceived importance of the environmental attribute. It was considered in the previous result section that these mixed results could be explained in relation to consumers' involvement with the product. Consequently, the findings support evidence that there is a positive relationship between environmental attitudes and the perceived importance of environmental attributes. Moreover, it indicates that respondents are more likely to base their purchases on products' environmental impact when buying laundry detergent or toilet paper.

Impact of the importance of environmental attributes on buying green. If subjects considered the environmental attribute to be more important among the product features, they may have bought ecologically considered products more often. The findings from the tests tend to support this proposition. That is, subjects who rated the environmental attribute as more important were more likely to purchase ecologically considered products. This result for the U.S. sample was consistent across the three products; that is, laundry detergent, toilet paper, and fruits and vegetables. However, for the Korean sample, such positive significant relationships between the importance of environmental attributes and buying green products were found for the two products besides laundry detergent. In general, the results support the positive association between the perceived importance of environmental attributes and purchases of green products. Furthermore, the results across the two national groups about the relationships among environmental attitudes, importance of pro-environmental attributes, and buying green suggest a possibility that purchases of green products can be affected by the categories of products (specifically, the consumer's involvement with the product) and/or the characteristics of consumer.

Impacts of ethnic difference on valuing Self-Transcendence/Openness to Change. Due to some cultural variations, this study proposed that the U.S. and Korean sample would be different in terms of the extents to which they value Self-Transcendence/Openness to Change, which was regarded as being related to environmentalism. To assess cultural difference between the two national groups, the individuals' collectivism was measured and analyzed by t-test, but they appeared not to be significantly different in their collectivism. However, the findings provided evidence

that the U.S. subjects and the Korean subjects were significantly different in terms of valuing an ecology subtype of Self-Transcendence/Openness to Change and a general type of Self-Transcendence/Openness to Change. That is, the U.S. sample valued a general type of Self-Transcendence/Openness to Change more strongly than the Korean sample did, while the former valued an ecology subtype of Self-Transcendence/Openness to Change less strongly than the latter did.

Impact of ethnic difference on environmentalism. This ethnic difference was also used to test whether the two ethnic groups were different in terms of their engagements in pro-environmental behavior. The results support the proposition that the U.S. and Korean subjects might be different in the extent to which they engage in pro-environmental behavior. In general, the U.S. subjects were less likely to engage in pro-environmental behavior than the Korean subjects. Moreover, the U.S. subjects attached less importance to the environmental attributes of laundry detergent, toilet paper, and fruits and vegetables than the Korean subjects did. The U.S. subjects showed less tendency to buy ecologically considered products than the Korean subjects did. This ethnic difference suggests that the difference in valuing an ecological subtype of Self-Transcendence/Openness to Change affects the difference between two ethnic groups in their pro-environmental behavior. It was found that the Korean subjects more strongly valued an ecology subtype of Self-Transcendence/Openness to Change than the U.S. subjects did. These results implied that biospheric values representing altruism toward the ecology may explain the subjects' pro-environmental tendencies better than altruistic values toward people, and suggested further testing to make sure whether the differences in perople's pro-environmental

behavior are due more to the differences in their orientations to values (especially biospheric values) than to the differences in any other variables such as ethnicity.

The impact of collectivism on value priorities and on pro-environmental behavior. This study was extended to explore the relationship between collectivism and environmentalism based on the previous evidence that individuals' collectivism may affect their environmental behavior. This study intended to explore the effect of collectivism on personal value priorities and on pro-environmental behavior. The U.S. and Korean sample respectively showed that collectivism was significantly related to Self-Transcendence/Conservation. Furthermore, the two national groups provided empirical evidence that collectivism was not related to pro-environmental behavior. Rather, the relationship between collectivism and pro-environmental behavior was negative according to the results for the U.S. subjects. A Self-Transcendence/Conservation value dimension was measured by five value items based on the motivational value types such as benevolence, conformity, and tradition. These motivational value types emphasize care for the welfare of people with whom one is in frequent personal contact as well as respect and obedience of the customs and ideas imposed by one's culture. These motivations underlying self-transcendence/conservation values help explain how or why collectivism may be in some conflict with biospherism (altruistic values for nature) and pro-environmental activities. These findings tend to support Schwartz's proposition (rather than McCarty and Shrum's suggestion) that individualism, rather than collectivism, may have a more positive impact on environmentalism, although this study did not show a positive significant relationship between individualism and pro-environmental behavior. Finally, the results indicate that

culturally oriented values such as individualism or collectivism may affect environmental behavior, and that more empirical studies are still needed to clarify the relationship.

Chapter 7

CONCLUSIONS, LIMITATIONS, IMPLICATIONS, AND SUGGESTIONS FOR FUTURE RESEARCH

Conclusions

The primary goal of this dissertation was to investigate the role of personal value structures in guiding individuals' environmental attitudes and behavior across cultures. Specifically, it attempted to examine the antecedents of pro-environmental behavior and to determine the relationships among the predictors of buying green behavior in particular as well as pro-environmental behavior in general. Moreover, this dissertation examined the impact of ethnic difference on value structures and environmental consumerism. This research found the predictors of pro-environmental behavior and stimulated further study by suggesting several possibilities to gain better understandings of variables which lead people to behave pro-environmentally.

In hypothesis one, this study examined the impact of values on environmental attitudes. It found that environmental attitudes might stem from biospheric values among the three value orientations that Stern et al. (1993) proposed as underlying environmental attitudes and behavior. Across the two national groups, biospheric values appeared to influence environmental attitudes, although the outputs of factor analysis by the two groups indicated that the location of the biospheric value items was different in the quadrants formed by Schwartz's two value dimensions; e.g., for the U.S. subjects the two biospheric items were located in a Self-Transcendence/Openness to Change dimension,

and for the Korean subjects the items were located in a Self-Transcendence/Conservation dimension. This finding indicates that Schwartz's value structures can be affected by ideas or beliefs and customs that cultures impose to individuals. In sum, the value dimensions, including the biospheric value items, showed a positive significant relationship with environmental attitudes across two cultures. In contrast to the biospheric-altruistic values reflecting one's concern for others and nonhuman species, the egoistic values enhancing self-interest (located in a Self-Enhancement/Conservation dimension) showed a negative relationship with environmental attitudes. This can be interpreted as evidence that values enhancing self-interest are related to lower levels of environmental concern.

In hypothesis two, this study investigated the impact of environmental attitudes on pro-environmental behavior and determined that attitude is a significant predictor of pro-environmental behaviors. When the subject has a positive attitude toward the environment, she or he is likely to perform a number of environmentally conscious behaviors, although the strengths of the relationship vary depending on the types of pro-environmental behavior. In hypothesis three, this study examined the moderating impact of PCE on the attitude-behavior relationship and the relationship between PCE and personal pro-environmental behavior. The findings suggest that in general, subjects with high level of PCE show higher attitude-behavior relationship than those with low level of PCE, except in particular cases of energy-saving and recycling behavior for the U.S. sample. For the Korean sample, this tendency is present for all measures of pro-environmental behaviors. Also, the results regarding the relationship between PCE and the four types of pro-environmental behaviors suggest that the relationship seems to be

somewhat behavior specific. That is, subjects consider some behaviors to be effective and others not. The greatest impact of PCE is on the behavioral measure that represents specific acts of personal responsibility such as energy saving, green buying, and recycling behavior.

Hypothesis four tested a conceptual model indicating the relationships among the predictors of pro-environmental behavior. While most of earlier studies on personal values addressed a single bivariate relationship, such as the value-behavior link, this study provided a fuller model describing the value-attitude-behavior relationship within a causal modeling approach. That is, the proposed model in this study emphasized a mediating construct, like attitude, between values and behavior. The results of model tests involving the two national groups demonstrated a significant effect of value orientations on environmental attitudes, which in turn affected pro-environmental behavior. Especially for the Korean sample, biospheric value orientations tend to have an indirect effect on pro-environmental behavior via attitudes toward the environment. Values were shown to have indirect effects on behavior: environmental attitudes provided a mediating role between the abstract values and specific behaviors. The U.S. sample also suggests an indirect effects of values on behavior, although they are not as obvious as the effects the Korean sample showed. The influence of values may be more apparent in instances when critical mediating constructs such as attitudes are explored.

As a second purpose of this study, the relationships among the variables related to green consumerism were examined. In hypotheses five to seven this study investigated the impact of values on the importance of environmental attributes. Although the environmental attributes included in the three categories of products were not salient

product attributes for the subjects across the two groups, endorsements of biospheric value orientations (an ecology type of self-transcendence) were positively associated with the perceived importance of environmental attributes. Furthermore, environmental attitudes in general were positively related to the perceived importance of environmental attributes and purchases of green products, although there were some variations across the three products and/or the two subjects. In sum, values influenced the product attributes the individuals evaluated when making purchase decisions. Specifically, a Self-Transcendence/Openness to Change dimension which consists of only the biospheric value items (in the case of the U.S. sample) and a Self-Transcendence/Conservation dimension including the biospheric value items (in the case of the Korean sample) were shown to be positively related to the individuals' evaluations of pro-environmental attributes, which in turn were positively related to actual behavior.

As the third purpose of this dissertation, in hypothesis eight it explored the impact of ethnic difference on environmental consumerism and intended to find a fundamental base of the differences in personal value structures the individuals hold. Furthermore, culturally oriented values such as collectivism were examined in relation to the individuals' pro-environmental behavior. The results from the study indicated that the U.S. and the Korean sample were significantly different in their valuing the biospheric value orientations (e.g., an ecology subtype of Self-Transcendence/Openness to Change) and also significantly different in their engagements in pro-environmental behaviors. That is, the U.S. subjects were less likely to endorse to biospheric values, and they were less likely to engage in pro-environmental behaviors generally and particularly in energy saving and green buying behavior than the Korean subjects were. These results, as

mentioned above, suggest that personal values can be better predictor of pro-environmental behavior than can ethnic difference, although further analysis for this suggestion is needed.

This study also suggests that collectivism may affect personal value priorities; that is, that collectivism is more related to self-enhancement and conservation values and less related to self-transcendence values. This tendency is obviously present in the U.S. sample. The Korean sample also indicated that collectivism influenced value priorities, but the two national groups showed a little variation on the value structures that collectivism could be related to. That is, for the Korean sample, collectivism was related to biospheric values as well as conservation values. The result of the Korean sample may be explainable in light of the outcomes of factor analysis for value structures; that is, biospheric value items were loaded in the same factor with items indicating self-transcendence/conservation values. Thus for the Korean subjects, the relationship of collectivism with biospherism was similar to that between collectivism and self-transcendence/conservation values. Consequently, some cultural differences between the two national groups have been demonstrated in several analytical results.

The relationship between collectivism and pro-environmental behavior was not significant across the two groups. However, negative relationship between the two variables indicated how collectivism could affect pro-environmental behavior. The negative relationship appeared across all measures of pro-environmental behaviors in the case of the U.S. sample, but the negative relationship was found only for political behavior in the case of the Korean sample. In general, the results from the study suggest that collectivism may negatively influence pro-environmental behavior, which contrasts

to the suggestion by McCarty and Shrum (1994). Rather, the results showed evidence supporting Schwartz's proposition. According to Schwartz (1990), individualism may be more positively related to pro-environmental behavior than collectivism, because individualism can be more closely related to the universalism value types of caring for the protection and welfare of all people and caring for nature.

Limitations

This study has several limitations. A potential limitation of this study is the use of a student sample. This may limit the generalizability of the findings. College students might affect the findings because they were young and in the process of completing their college education. Although the data collected through a questionnaire were related to the respondents in the sample, a non-student sample would enhance the interpretations of the findings of this study. Another limitation of this research is related to measurement. That is, this study used a short scale of values based on Schwartz's value measurement scale. It did not use all of the items from Schwartz's values instrument. Schwartz's values instrument was used across cultures in multiple countries, but it was not tested against the Korean sample. Also, pro-environmental behavior was measured with items selected from research conducted in the United States. Therefore, it is hard to eliminate the possibility that some items to measure individuals' pro-environmental actions might not be common to the Korean sample. It is possible that meaning we attached to the constructs is different across cultures. What this study has operationally defined as pro-environmental behavior may not be considered such in other countries; for example,

using public transportation may be considered pro-environmental for the U.S. subjects but not for the Korean subjects.

Implications

Despite these limitations, this cross-cultural research on pro-environmental values, attitudes, self-perception of efficacy, and behavior will be essential as psychologists attempt to develop models that predict behavior intended to help the ecological environment. This dissertation contributes to the existing theoretical research on the antecedents of people's pro-environmental behavior by proposing and empirically testing a conceptual model of pro-environmental behavior that emphasizes mediating constructs such as attitudes. Understanding the psychological antecedents of pro-environmental behavior provides information about what motivates the behavior. Furthermore, an emphasis on who does not behave pro-environmentally–and why–helps marketers and public policymakers to focus on characteristics of the person who is not participating in pro-environmental behaviors.

Cross-cultural evidence on the antecedents of pro-environmental behavior and the relationships among the variables will contribute to improving the prediction of pro-environmental behavior and to determining the directions environmental marketing strategies must take in international market places. Practically, the outcomes of this study will help segment a group of people who are not responding to pro-environmental actions on particular characteristics. This study revealed different motivations for different people, and this indicates that different types of communication tactics are needed according to the target audience. Especially, marketers and/or public policymakers need

to target their messages in order to overcome the barriers that are inhibiting the performance of specific behaviors designed to improve environmental problems. For instance, the results of this study suggest the development of strategies to overcome negative perceived consumer effectiveness. In fact, persons who were high in concern and low in PCE were less supportive of pro-environmental behaviors than those who were high in concern and high in PCE were. Thus, such persuasive communication strategies would be more adequate than emotional communication strategies to encourage consumers to make individual efforts for the better ecological environment. Appeals that stress how the individual can make a difference (e.g., the problem of energy shortage can be resolved by your actions like turning off unnecessary light) would significantly affect individuals' PCE. The heightened PCE level would positively affect consumers' willingness to engage in pro-environmental behaviors. These findings have significant implications for the design of promotion programs of green marketing strategies. Rather than a tactic increasing concern for the problem, a persuasive tactic emphasizing the difference made by an individual's daily actions would be more effective in encouraging his or her engagement in pro-environmental actions. These suggestions are not different from the ones of previous studies (e.g., Ellen et al., 1991).

On the other hand, public policymakers can help enhance an individual's level of PCE by providing information and rewarding behavior consumers should know how to do for the betterment of the environment. For example, consumers can be motivated either by programs that provide practical information (e.g., how to save energy to benefit human beings as well as the environment) or by educational programs, such as one that

would help a consumer identify "green" products that are truly manufactured out of materials benign to the environment.

The understanding of the value-attitude-behavior link will greatly assist in designing persuasive communications to change attitudes and subsequent behavior. If one indeed holds a particular set of attitudes (e.g., favorable) toward green products because the attitudes are seen as a means to attaining a particular end-state value (e.g., an altruistic value for nature and other people), then messages addressing and enforcing this link may help increase the consistency between people's pro-environmental attitudes and these behaviors.

Particularly, the findings about green consumerism indicate important facts that marketing managers who are interested in green marketing should recognize. That is, this study showed that pro-environmental attributes still ranked seventh or eighth of eight factors influencing buyers' purchase decisions. However, some analytical results of this study also demonstrated that consumers who are environmentally concerned tend to rate such environmental attributes highly. This indicated the possibilities of the expansion of green marketing. Therefore, green marketing managers need to understand what consumers want from them and develop green products based on the findings. In other words, they would better develop "green" goods to be competitively priced and to perform the same as others, and thus help consumers use a product's greenness to differentiate two relatively equal goods.

Suggestions for Future Research

This study also raises some research questions for future research. Future research should include, in addition to the suggestions for future study mentioned in the discussion section, the impact of perceived consumer effectiveness (PCE) in the proposed causal model as a moderator variable. For example, two subgroups may show different explanatory power in predicting pro-environmental behavior according to the levels of PCE. Based on some variations concerning the moderating effects of PCE and the differential impacts of PCE on behaviors, future study needs to include more broad types of pro-environmental behaviors or to focus on a specific behavior. This will clarify whether the moderating effects as well as the direct impacts of PCE are affected by the characteristics of behavior. Furthermore, the influences of cultures on Schwartz's value structures should be investigated. This study showed evidence that there might be cultural impact on human value structures presented by Schwartz and Bilsky (1987, 1990). Finally, this research suggests that future study needs to investigate the interrelationship among variables such as value, environmental attitudes, importance of pro-environmental attribute, and ecological choice in a causal modeling approach.

APPENDIX A

Table 1: The Attributes of the Selected Products

Attributes		
Laundry detergent	Toilet paper	Fruits and Vegetables
1. Type (e.g., powder or liquid)	1. Roll size (e.g., double or single roll)	1. Freshness
2. Scent	2. Thickness	2. Taste
3. Nonpolluting ingredient [a] (e.g., biodegradable)	3. Made from recycled paper [a]	3. Organically grown [a]
4. Price	4. Price	4. Price
5. Safe for colors	5. Softness	5. Nutritional value
6. Removal of tough stain	6. Absorbent	6. Place of origin
7. Range of size available	7. Range of size available (# of rolls)	7. Range of size available (lb.)
8. Prior use of the product	8. Prior use of the product	8. Prior use of the product

a. The environmentally considered attribute for the product.

Table 2-1: Value Items according to Schwartz's Dimensions of Self-Transcendence Versus Self-Enhancement (T/E), Openness to Change Versus Conservation (O/C), and 10 Motivational Types

Value	T/E	O/C	Motivational Type
1. Equality	T	O	Universalism
2. Social power	E	C	Power
3. Freedom	T	O	Self-Direction
4. An exciting life	E	O	Stimulation
5. Wealth	E	C	Power
6. Respect for tradition	T	C	Tradition
7. Self-discipline	T	C	Conformity
8. Family security	E	C	Security
9. Unity with nature	T	O	Universalism
10. A varied life	E	O	Stimulation
11. Authority	E	C	Power
12. Loyal	T	C	Benevolence
13. Ambitious	E	O	Achievement
14. Broad-minded	T	O	Universalism
15. Protecting the environment	T	O	Universalism
16. Influential	E	O	Achievement
17. Honoring parents and elders	T	C	Conformity
18. Honest	T	C	Benevolence
19. Helpful	T	C	Benevolence
20. Enjoying life	E	O	Hedonism
21. Curious	T	O	Self-Direction
22. Successful	E	O	Achievement

Table 2-2: Factor Loadings of Value Items with Quartimax Rotation (The United States)

Item	The United States	
	Factor Loading	α
Factor 1: Self-Transcendence/Conservation		.77
Honoring of parents and elders	.71	
Honest	.72	
Helpful	.68	
Loyal	.60	
Family security	.69	
Factor 2: Self-Enhancement/Openness to Change		.57
An exciting life	.73	
Enjoying life	.58	
A varied life	.58	
Factor 3: Self-Enhancement/Openness to Change II		.58
Self-discipline	.66	
Influential	.54	
Successful	.64	
Factor 4: Self-Transcendence/Openness to Change (Ecology)		.81
Protecting the environment	.78	
Unity with nature	.82	
Factor 5: Self-Transcendence/Openness to Change		.59
Broad-minded	.70	
Equality	.56	
Freedom	.68	
Factor 6: Self-Enhancement/Conservation		.61
Social power	.85	
Authority	.76	
Total variance explained: 59%		

Table 2-3: Factor Loadings of Value Items with Quartimax Rotation (Korea)

Item	Korea	
	Factor Loading	α
Factor 1: Self-Transcendence/Conservation (Ecology)		.81
Honoring of parents and elders	.81	
Honest	.77	
Helpful	.76	
Respect for tradition	50	
Protecting the environment	.72	
Unity with nature	.52	
Factor 2: Self-Enhancement/Openness to Change		.65
An exciting life	.72	
Enjoying life	.71	
A varied life	.67	
Factor 3: Self-Enhancement/Conservation		.67
Social power	.77	
Wealth	.72	
Authority	.60	
Factor 4: Self-Transcendence/Openness to Change		.53
Equality	.79	
Freedom	.53	
Factor 5: Self-Transcendence/Openness to Change II		.64
Loyal	.64	
Broad-minded	.64	
Ambitious	.54	
Total variance explained: 59%		

Table 3: Comparisons of the U.S. and the Korean Sample on Attitudes and Collectivism

	Mean (SD) United States (N=305)	Mean (SD) Korea (N=274)	t-value	P-value
Attitudes	4.94 (.79)	5.24 (.68)	-4.808	.000

Note: Responses were made on a 7-point scale, ranging from 1=strongly disagree to 7=strongly agree

	Mean (SD) United States (N=304)	Mean (SD) Korea (N=272)	t-value	P-value
Collectivism	3.44 (.51)	3.42 (.62)	.355	.723

Note: Responses were made on a 5-point scale, ranging from 1=extremely unimportant to 5=extremely important

Table 4: Descriptions of PCE Items and Scale Length, Means, and Reliabilities

Item	# of item	Mean (SD)		α	
		U.S.	Korean	U.S.	Korean
1. There is not much that I can do about the environment.*		4.95 (1.44)	4.54 (1.40)		
2. I feel personally helpless to have much of an impact.*		4.27 (1.49)	4.43 (1.48)		
3. I don't feel I have enough knowledge to make well-informed decisions on environmental issues.*		4.24 (1.58)	3.80 (1.37)		
4. I feel capable of helping solve the environment problems.		4.22 (1.32)	4.92 (1.31)		
PCE (general)	4	4.42 (1.05)	4.42 (.94)	.69	.60
5. I can protect the environment by buying products that are friendly to the environment.		5.42 (1.27)	5.38 (1.18)		
6. I feel I can help solve natural resource problems by conserving water and energy.		5.15 (1.40)	5.65 (1.23)		
7. Each person's behavior can have a positive effect on society by signing a petition in support of promoting the environment.		4.86 (1.42)	4.70 (1.46)		
PCE (special)	3	5.14 (1.10)	5.24 (1.04)	.74	.73
PCE (total)	7	4.73 (.91)	4.78 (.81)	.76	.70

Note: Responses were made on a 7-point scale, ranging from 1=strongly disagree to 7=strongly agree

*means are calculated after reversibly coded.

Table 5: Proenvironmental Behavior Factors with Varimax Rotated Factor Loadings, Means, and Standard Deviations

Proenvironmental behavior	The United States				Korea			
	Factor loading	Mean	SD	α	Factor loading	Mean	SD	α
Factor 1: Green-buying		2.57	.79	.82		2.70	.78	.72
I have avoided buying a product because it had potentially harmful environmental effects.	.74	2.41	1.11		.70	2.50	1.12	
I have switched products for ecological reasons.	.69	2.15	1.06		.66	2.38	1.09	
When I have a choice between two equal products, I purchase the one less harmful to other people and the environment.	.68	3.07	1.22		.58	3.23	1.10	
I make s special effort to buy household chemicals such as detergents and cleansing solutions that are environmentally friendly.	.62	2.28	1.10		.59	2.52	.99	
I have signed a petition in support of promoting the environment.	.56	2.17	1.35		.63	2.84	1.36	
I have purchased brands packaged in recyclable or reusable containers.	.53	3.38	.99					
I make a special effort to buy paper (e.g., toilet paper) that are made from recycled materials.	.44	2.52	1.04					
Factor 2: Political behavior		1.39	.55	.73		1.36	.56	.74
I have written a letter to the editor of a newspaper about the environment.	.80	1.09	.44		.87	1.14	.53	
I have written a letter to the government (or congressman) about the environment.	.80	1.28	.78		.81	1.19	.65	
I have contributed money to support an environmental group or organization.	.61	1.73	1.09		.60	1.65	.92	
I have attended meeting(s)/seminar(s) related to environmental protection.	.61	1.65	.92		.69	1.46	.82	
I bring my own bag when shopping.	.57	1.18	.58					
Factor 3: Energy-saving		2.75	.81	.64		2.92	.92	.60
I try to limit consumption of water.	.74	2.25	1.19		.74	3.04	1.15	
I try to reduce the amount of paper used or produced.	.63	2.61	1.08					
I take steps to reduce the amount of electricity I use.	.58	3.62	1.17		.69	3.52	1.26	
I bring my own bag when shopping.					.51	2.21	1.30	
I use public transportation, carpools, or a bicycle.	.51	2.51	1.22					
Factor 4: Recycling		2.95	1.20	.68		2.73	.83	.69
I keep garbage in separate piles of glass, plastic, paper, newspapers and metal for recycling.	.83	2.65	1.41		.60	3.47	1.09	
I use a recycling center	.81	3.24	1.36		.77	2.44	1.17	
I have purchased brands packaged in recyclable or reusable containers.					.60	2.63	1.09	
I use public transportation, carpools, or a bicycle.					.61	2.38	1.22	
Total variances explained: 56%					Total variances explained: 54%			

Note: Scale ranges from 1 = never to 5 = always.

Table 6: Description of Personal Involvement Inventory Means and Standard Deviations

Product	N. of Cases		Mean (SD)		t-value	p-value
	U.S.	Korea	U.S.	Korea		
Laundry detergent	168	114	42.82 (8.31)	45.52 (6.64)	-3.02	.003
Toilet paper	153	135	45.71 (7.23)	52.0 (7.19)	-7.39	.000
Fruits and vegetables	185	113	56.57 (8.1)	55.15 (10.82)	1.36	.176

Note: Means are ranged from 10 to 70

Table 7-1: Descriptions of Product Attribute Items, Means, and Standard Deviation (Laundry detergent)

Product Attribute	N. of Cases		Mean (SD)	
	U.S.	Korea	U.S.	Korea
Type	172	120	3.86 (.99)[4]	3.38 (.99)[8]
Scent	172	120	3.73 (1.13)[6]	4.33 (.75)[3]
Biodegradable*	172	120	3.01 (1.04)[8]	3.63 (.92)[7]
Price	172	120	4.38 (.91)[1]	4.49 (.71)[2]
Safe for colors	172	120	4.30 (.81)[2]	4.17 (.85)[4]
Removal of tough stains	172	120	4.28 (.73)[3]	4.63 (.58)[1]
Range of size available	172	120	3.49 (1.04)[7]	3.75 (.98)[6]
Prior use of the product	172	120	3.80 (1.08)[5]	3.98 (.90)[5]

Note: Responses were made on a 5-point scale, ranging from 1=strongly unimportant to 5=strongly important

Table 7-2: Descriptions of Product Attribute Items, Means, and Standard Deviation (Toilet paper)

Product Attribute	N. of Cases		Mean (SD)	
	U.S.	Korea	U.S.	Korea
Roll size	155	143	3.63 (.99)[6]	3.66 (.88)[7]
Price	156	143	4.45 (.87)[1]	4.23 (.81)[2]
Thickness	155	143	3.89 (.94)[3]	3.83 (.89)[5]
Softness	156	143	4.28 (.83)[2]	4.38 (.78)[1]
Absorbent	156	143	3.81 (.95)[5]	4.10 (.92)[3]
Made from recycled paper*	155	143	2.85 (.95)[8]	3.08 (.94)[8]
Range of package sizes	154	143	3.83 (1.03)[4]	3.78 (1.03)[6]
Prior use of the product	156	143	3.56 (1.13)[7]	3.92 (.96)[4]

Note: Responses were made on a 5-point scale, ranging from 1=strongly unimportant to 5=strongly important

Table 7-3: Descriptions of Product Attribute Items, Means, and Standard Deviation (Fruits and Vegetables)

Product Attribute	N. of Cases		Mean (SD)	
	U.S.	Korea	U.S.	Korea
Freshness	189	113	4.84 (.56)[1]	4.87 (.41)[1]
Price	189	113	3.92 (1.18)[4]	4.09 (.96)[4]
Organically grown*	189	113	3.11 (1.15)[7]	3.59 (1.01)[7]
Nutritional value	189	113	4.25 (.91)[3]	3.96 (1.03)[5]
Taste	189	113	4.80 (.55)[2]	4.73 (.53)[2]
Place of origin	189	113	2.94 (1.11)[8]	3.42 (.99)[8]
Range of size available	189	113	3.34 (1.14)[6]	3.63 (1.08)[6]
Prior use of the product	189	113	3.80 (1.10)[5]	4.19 (.94)[3]

Note: Responses were made on a 5-point scale, ranging from 1=strongly unimportant to 5=strongly important

Table 8: Multiple Regression Analysis for the Prediction of Environmental Attitudes

Predictor Variables	The United States (N=303)	Korea (N=273)
Value Structures		
1. Self-Enhancement/Conservation	-.10	-.09
2. Self-Enhancement/Openness to Change	-.02	.04
3. Self-Enhancement/Openness to Change II [a]	-.01	
4. Self-Transcendence/Conservation [a]	-.08	
5. Self-Transcendence/Conservation (Ecology) [b]		.43**
6. Self-Transcendence/Openness to Change II [b]		-.03
7. Self-Transcendence/Openness to Change	.15*	-.07
8. Self-Transcendence/Openness to Change (Ecology) [a]	.43**	
R Square	.46	.40
Adjusted R Square	.22	.16
F	13.52**	10.45**

Note: a. The value factors for only the U.S. sample.
b. The value factors for only the Korean sample
Betas presented are standardized betas. *P < .05, **P < .01.

Table 9: The Relations between Environmental Attitudes and Proenvironmental Behavior (Correlations)

(a) U.S.

correlation	attitudes (N=305)	proenviron-mental behavior	energy saving	green buying	political behavior	recycling
attitudes	1.00					
proenviron-mental	.39**	1.00				
energy saving	.30**	.78**	1.00			
green buying	.38**	.91**	.61**	1.00		
political behavior	.22**	.68**	.34**	.54**	1.00	
recycling	.21**	.60**	.38**	.39**	.24**	1.00

(b) Korea

correlation	attitudes (N=270)	proenviron-mental behavior	energy saving	green buying	political behavior	recycling
attitudes	1.00					
proenviron-mental	.20**	1.00				
energy saving	.21**	.74**	1.00			
green buying	.17**	.80**	.44**	1.00		
political behavior	-.15**	.49**	.14*	.35**	1.00	
recycling	.24**	.76**	.52**	.41**	.15*	1.00

Note: *P < .05, **P < .01.

Table 10: Regression Coefficient across High and Low Level of Moderator Variable (PCE)

a) U.S. (N=205)

Moderator	Dependent V.	R Square	Attitudes	F
High PCE (N=101)	Proenvironmental Behavior	.13	..36**	4.51*
Low PCE (N=104)	Proenvironmental Behavior	.09	.31**	
High PCE (N=101)	Energy-saving	.03	.18	5.62**
Low PCE (N=104)	Energy-saving	.10	.32**	
High PCE (N=101)	Green-buying	.17	.42**	3.88*
Low PCE (N=104)	Green-buying	.08	.29**	
High PCE (N=101)	Political behavior	.07	.26**	.41
Low PCE (N=104)	Political Behavior	.01	.08	
High PCE (N=101)	Recycling	.04	.20*	4.50*
Low PCE (N=104)	Recycling	.05	.22*	

b) Korea (N=151)

Moderator	Dependent V.	R Square	Attitudes	F
High PCE (N=70)	Proenvironmental Behavior	.09	.30*	6.39**
Low PCE (N=81)	Proenvironmental Behavior	.00	-.07	
High PCE (N=70)	Energy-saving	.04	.20	5.26**
Low PCE (N=81)	Energy-saving	.01	.10	
High PCE (N=70)	Green-buying	.08	.27*	9.57**
Low PCE (N=81)	Green-buying	.00	.03	
High PCE (N=70)	Political behavior	.01	.10	4.95**
Low PCE (N=81)	Political Behavior	.12	-.34**	
High PCE (N=70)	Recycling	.05	.23	5.38**
Low PCE (N=81)	Recycling	.00	.22*	

Note: *P < .05, **P < .01.

Table 11: The Relations between PCE and Proenvironmental Behavior (Correlations)

a) U.S.

correlation	PCE (N=306)	proenviron-mental behavior	energy saving	green buying	political behavior	recycling
PCE	1.00					
proenviron-mental	.30**	1.00				
energy saving	.30**	.78**	1.00			
green buying	.28**	.91**	.61**	1.00		
political behavior	.07	.68**	.34**	.54**	1.00	
recycling	.25**	.60**	.38**	.39**	.24**	1.00

(b) Korea

correlation	PCE (N=271)	proenviron-mental behavior	energy saving	green buying	political behavior	recycling
PCE	1.00					
proenviron-mental	.20**	1.00				
energy saving	.21**	.74**	1.00			
green buying	.21**	.80**	.44**	1.00		
political behavior	-.12	.49**	.14*	.35**	1.00	
recycling	.22**	.76**	.52**	.41**	.15*	1.00

Note: *P < .05, **P < .01.

Table 11-1: Influences of Attitudes and PCE on Proenvironmental Behavior (Beta coefficients)

Behavioral measures	Attitudes	PCE	R-square	Attitudes	PCE	R-square
	(The United States)			(Korea)		
Proenvironmental behavior	.340**	.214**	.202	.147*	.149*	.054
Energy-saving	.238**	.230**	.141	.175**	.169**	.072
Green-buying	.224**	.188**	.175	.140*	.174**	.061
Political behavior	.208**	.029	.048	-.125*	-.090	.029
Recycling behavior	.154**	.210**	.086	.200**	.169**	.083

Note: *P < .05, **P < .01.

Table 12: Correlations of Latent Constructs

a) U.S.

Constructs	Values	Attitudes	Behavior
Values	1.00		
Attitudes	.538	1.00	
Behavior	.417	.408	1.00

b) Korea

Constructs	Values	Attitudes	Behavior
Values	1.00		
Attitudes	.473	1.00	
Behavior	.329	.404	1.00

Table 13: Factor Loadings of Indicators of Latent Constructs

a) U.S.

Factors	Indicators	Unstd.	Std.	R Square
Values	Protecting the environment	1.000	.914	.835
	Unity with nature	.825	.741	.550
Attitudes	The balance of nature is very delicate and easily upset.	1.000	.753	.567
	When humans interfere with nature it often produces disastrous consequences.	1.127	.757	.573
	Humans must live in harmony with nature in order to survive.	.839	.649	.422
	Mankind is severely abusing the environment.	.984	.668	.447
Behavior	I try to reduce the amount of paper used or produced.	1.000	.606	.367
	I make a special effort to buy paper and plastic products made from recycled materials.	1.033	.649	.421
	When I have a choice between two equal products, I purchase the one less harmful to other people and the environment.	1.193	.640	.410
	I make a special effort to buy detergents and cleansing solutions that are environmentally friendly.	1.283	.769	.591
	I have switched products for ecological reasons.	1.243	.770	.592
	I have avoided buying a product because it had potentially harmful environmental effects	1.123	.665	.442

b) Korea

Constructs	Indicators	Unstd.	Std.	R Square
Values	Protecting the environment	1.000	.689	.475
	Unity with nature	.926	.546	.298
	Honoring parents and elders	.825	.709	.502
	Helpful	.990	.741	.549
	Honest	.888	.684	.468
	Respect for tradition	.793	.521	.271
Attitudes	We are approaching the limit of the number of people the Earth can support.	1.000	.576	.331
	The balance of nature is very delicate and easily upset.	1.494	.742	.551
	When humans interfere with nature it often produces disastrous consequences.	.982	.652	.425
Behavior	I try to reduce the amount of paper used or produced.	1.000	.623	.388
	I have purchased brands packaged in recyclable or reusable containers.	1.064	.669	.447
	I try to limit consumption of water.	1.047	.627	.393
	When I have a choice between two equal products, I purchase the one less harmful to other people and the environment.	.831	.518	.268
	I make a special effort to buy detergents and cleansing solutions that are environmentally friendly.	.722	.501	.251

Table 14: Parameter Estimates

(a) U.S.

Relationship From → To	(Figure 2) Proposed Model		(Figure 3) Revised Model	
	Unstd.	Std.	Unstd.	Std.
Values → Attitudes	0.431	0.569	0.397	0.538
Attitudes → Behavior	0.316	0.437	0.185	0.258
Goodness-of-fit indices				
χ^2 (d.f.)	99.704 (52)		87.093 (51)	
Joreskog-Sordom Goodness of Fit Index	0.949		0.955	
Bentler-Bonett Normed Fit Index	0.927		0.937	
Comparative Fit Index	0.963		0.972	

(b) Korea

Relationship From → To	(Figure 1) Proposed Model		(Figure 2) Revised Model	
	Unstd.	Std.	Unstd.	Std.
Values → Attitudes	0.450	0.505	0.433	0.473
Attitudes → Behavior	0.414	0.435	0.296	0.320
Goodness-of-fit indices				
χ^2 (d.f.)	98.554 (75)		94.973 (74)	
Joreskog-Sordom Goodness of Fit Index	0.950		0.953	
Bentler-Bonett Normed Fit Index	0.900		0.904	
Comparative Fit Index	0.974		0.977	

Table 15: Regression Coefficients of Value Structures on the Importance of Environmental Attributes (The United States)

Dependent variable	TC	EO	EO II	TOE	TO	EC	R-square
Biodegradable (laundry detergent)	-.02	-.06	.10	.25**	.08	-.01	.09
Made from recycled paper (toilet paper)	-.01	-.11	.02	.33**	.11	-.04	.12
Organically grown (fruits and vegetables)	-.06	-.08	.19**	.22**	.14*	.03	.12

Note: *P < .05, **P < .01.
TC = Self-Transcendence/Conservation,
EO = Self-Enhancement/Openness to change,
EO II = Self-Enhancement/Openness to change II,
TOE = Self-Transcendence/Openness to change (ecology),
EC = Self-Enhancement/Conservation.

Table 16: Regression Coefficients of Value Structures on the Importance of Environmental Attributes (Korea)

Dependent variable	TCE	EO	TO	TO II	EC	R-square
Biodegradable (laundry detergent)	.39**	.01	-.04	-.09	.01	.11
Made from recycled paper (toilet paper)	.25**	-.02	-.03	.09	-.43	.11
Organically grown (fruits and vegetables)	.33**	.09	-.08	-.12	.06	.10

Note: *P < .05, **P < .01.
TCE = Self-Transcendence/Conservation (Ecology),
EO = Self-Enhancement/Openness to change,
TO = Self-Transcendence/Openness to change,
TO II = Self-Transcendence/Openness to change II,
EC = Self-Enhancement/Conservation.

Table 17: The Relations between Environmental Attitudes and the Importance of Environmental Attributes (Correlations)

Correlation	Attitudes (U.S.)	Attitudes (Korea)
Biodegradable (Laundry Detergent)	.28**	.20**
Made from recycled paper (Toilet paper)	.28**	.16**
Organically grown (Fruits and Vegetables)	.11	.17**

Note: *P < .05, **P < .01.

Table 18: The Relations Between the Importance of Environmental Attributes and Buying Green Products (Correlations)

Predictor Variables	Buying Green Products	
	U.S.	Korea
Biodegradable (Laundry detergent)	.47**	.18
Made from recycled paper (Toilet paper)	.43**	.26**
Organically grown (Fruits and Vegetables)	.49**	.52**

Note: *P < .05, **P < .01.

Tables 19 and 20: Comparisons of the U.S. Sample and the Korean Sample on Valuing Self-Transcendence/Openness to Change and Proenvironmental Behavior (t-test)

Independent Variables	Mean (SD)		t-value	p-value
	U.S. (N=305)	Korea (N=271)		
Self-Transcendence/Openness to Change (General)	6.19 (.64)	5.95 (.71)	4.18**	.000
Self-Transcendence/Openness to Change (Ecology)	5.01 (1.21)	5.30 (1.08)	-3.05**	.002
Proenvironmental Behavior	2.32 (.60)	2.42 (.55)	-1.99*	.047
Energy-saving	2.75 (.81)	2.92 (.92)	-2.44*	.015
Green-buying	2.57 (.79)	2.70 (.78)	-1.97*	.049
Political Behavior	1.39 (.55)	1.36 (.56)	.54	.593
Recycling Behavior	2.95 (1.20)	2.73 (.83)	2.54*	.011

Note: *P < .05, **P < .01.

Tables 21 and 22: Comparisons of the U.S. Sample and the Korean Sample on the Importance of Environmental Attributes and Buying Green Products (t-test)

Independent Variables	Mean (SD)		t-value	p-value
	U.S.	Korea		
Environmental Attributes				
Biodegradable (laundry detergent)	3.01 (1.04)	3.63 (.92)	-5.37**	.000
Made from recycled paper (toilet paper)	2.85 (.95)	3.08 (.94)	-2.18*	.030
Organically grown (fruits and vegetables)	3.11 (1.14)	3.59 (1.01)	-3.86**	.000
Buying green Products				
Laundry detergent	2.40 (1.07)	2.56 (1.00)	-1.37	.173
Toilet paper	2.51 (1.06)	2.40 (.90)	.980	.328
Fruits and Vegetables	2.13 (1.07)	2.92 (1.04)	-6.29**	.000

Note: *P < .05, **P < .01.

Table 23: The Relations between Collectivism and Value Priorities (Simple Regression Analysis)

a) U.S. (N=302)

Predictor	EC	EO	TC	TO	TOE
Collectivism	.17**	.22**	.26**	.06	.07
R Square	.03	.05	.07	.00	.00
F	8.73**	15.25**	22.55**	1.12	1.28

Note: Betas presented are standardized betas.
*P < .05, **P < .01.

b) Korea (N=271)

Predictor	EC	EO	TC	TO	TOE
Collectivism	.07	.09	.21**	.09	.15*
R Square	.01	.01	.42	.01	.02
F	1.24	2.32	11.96**	2.21	6.32*

Note: Betas presented are standardized betas.
*P < .05, **P < .01.

Table 24: The Relations between Collectivism and Proenvironmental Behavior (Simple Regression Analysis)

a) U.S.

Predictor	Proenvironmental Behavior	Energy-saving	Green-Buying	Political Behavior	Recycling
Collectivism	-.09	-.04	-.08	-.05	-.08
R Square	.01	.00	.01	.00	.01
F	2.21	.46	2.11	.83	2.03

Note: Betas presented are standardized betas.
*P < .05, **P < .01.

b) Korea

Predictor	Proenvironmental Behavior	Energy-saving	Green-Buying	Political Behavior	Recycling
Collectivism	.10	.07	.11	-.08	.10
R Square	.01	.01	.01	.01	.01
F	2.43	1.49	3.53	1.55	2.40

Note: Betas presented are standardized betas.
*P < .05, **P < .01.

Figure 1: Theoretical Model of Relations among Motivational Types of Values, Higher Order Value Types, and Bipolar Value Dimensions. (Taken from Schwartz S. H 1992, Universals in the content and structure of values: Theoretical advances and empirical tests in 20 countries, *Advances in Experimental Social Psychology*, 25, 1-65, p. 45)

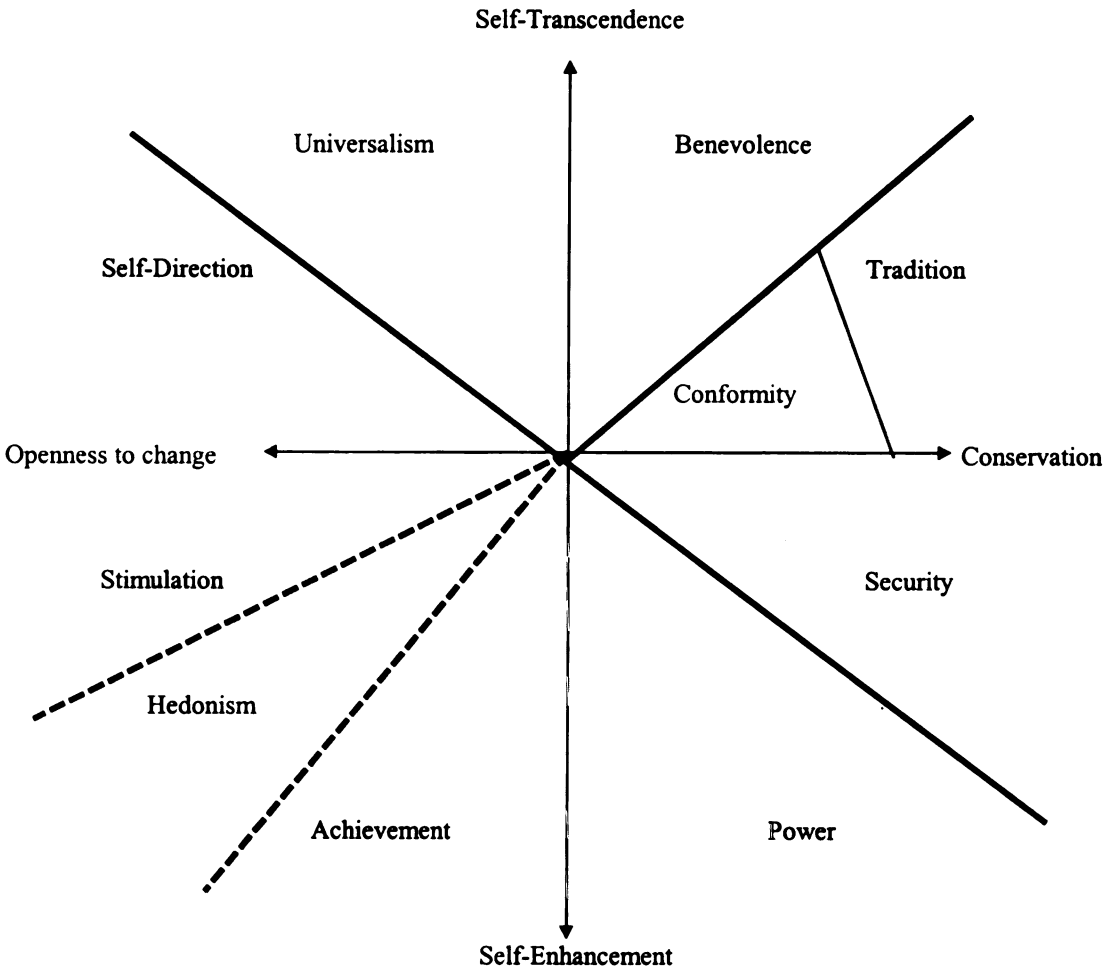


Figure 2: The Interrelationships of Values, Environmental Attitudes, and Pro-environmental behavior

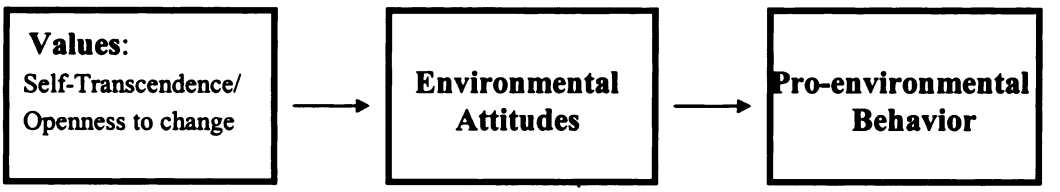


Figure 3: The Moderating Effect of PCE between Environmental Attitudes and Pro-environmental Behavior

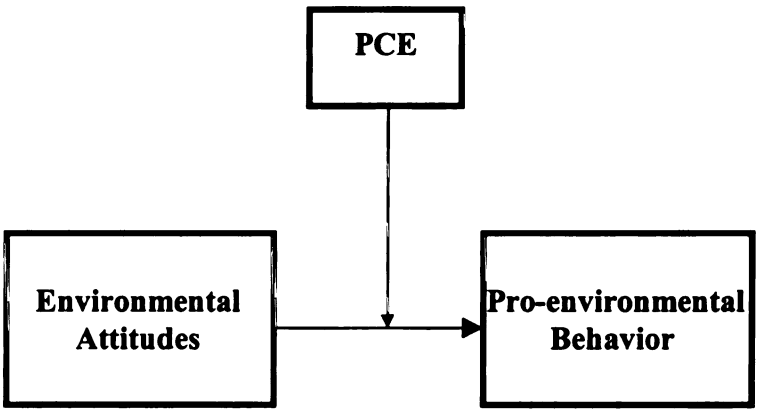
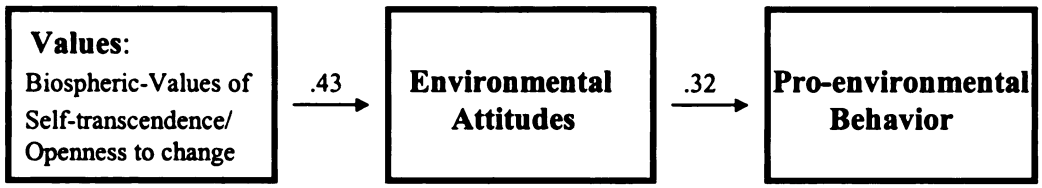
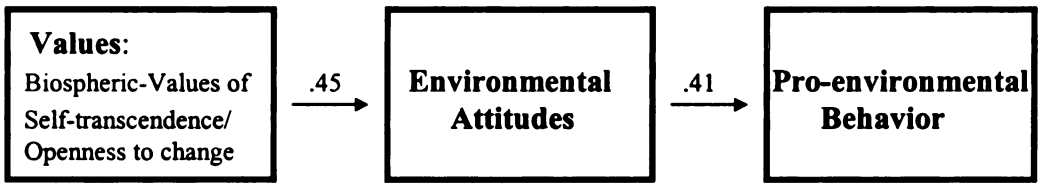


Figure 4: The Proposed Model Regarding the Interrelationships among the Environmental Variables

(a) U.S.



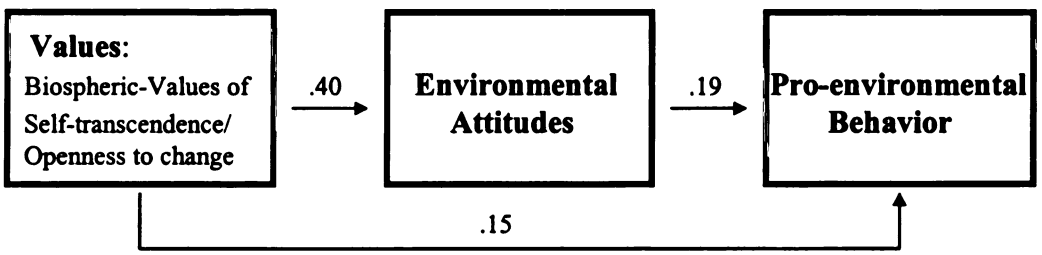
(b) Korea



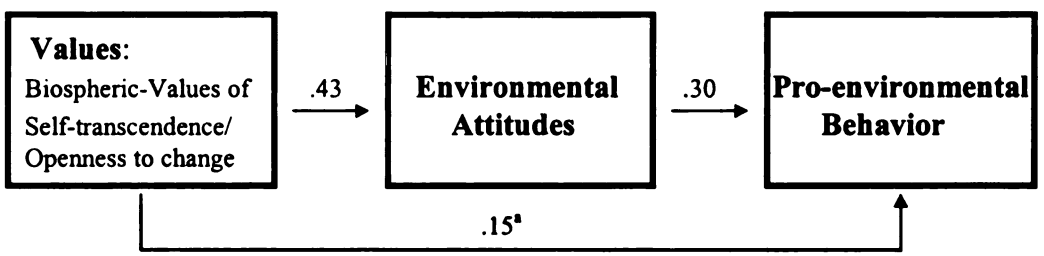
Note: All the path coefficients are unstandardized and significant at $p < .01$.

Figure 5: The Revised Model regarding the Interrelationships among the Environmental Variables

(a) U.S.



(b) Korea



Note: [a] Not significant ($p > .05$). All the other path coefficient are significant at $p < .01$.
All the path coefficients are unstandardized

APPENDIX B

Measurement Items

Section I: Values

"AS A GUIDING PRINCIPLE IN MY LIFE,"

Endpoints: Extremely Important/Extremely Not Important

1. EQUALITY (equal opportunity for all)
2. SOCIAL POWER (control over others, dominance)
3. FREEDOM (freedom of action and thought)
4. AN EXCITING LIFE (stimulating experiences)
5. WEALTH (material possessions, money)
6. SELF-DISCIPLINE (self-restraint, resistance to temptation)
7. FAMILY SECURITY (safety for loved ones)
8. UNITY WITH NATURE (fitting into nature)
9. A VARIED LIFE (filled with challenge, novelty, and change)
10. AUTHORITY (the right to lead or command)
11. LOYAL (faithful to my friends, group)
12. AMBITIOUS (hardworking, aspiring)
13. BROAD-MINDED (tolerant of different ideas and varied beliefs)
14. PROTECTING THE ENVIRONMENT (preserving nature)
15. INFLUENTIAL (having an impact on people and events)
16. HONORING OF PARENTS AND ELDER (showing respect)
17. HONEST (genuine, sincere)
18. HELPFUL (working for the welfare of others)
19. ENJOYING LIFE (enjoying food, sex, leisure, etc.)
20. CURIOUS (interested in everything, exploring)
21. RESPECT FOR TRADITION (preservation of time-honored customs)
22. SUCCESSFUL (achieving goals)

Section II: Attitudes

Endpoints: Strongly Agree/Strongly Disagree

1. We are approaching the limit of the number of people the Earth can support.
2. The balance of nature is very delicate and easily upset.
3. When humans interfere with nature it often produces disastrous consequences.
4. Humans have the right to modify the natural environment to suit their needs.
5. Mankind was created to rule over the rest of nature.
6. Plants and animals exist primarily to be used by humans.
7. Humans must live in harmony with nature in order to survive.
8. To maintain a healthy economy we will have to develop a "steady-state" economy where industrial growth is controlled.
9. The Earth is like a spaceship, with only limited room and resources.
10. Humans need not adapt to the natural environment because they can remake it to suit their needs.
11. There are limits to growth beyond which our industrialized society cannot expand.
12. Mankind is severely abusing the environment.

Section III: Behaviors

Endpoints: Always/Never

1. I make a special effort to buy fruits and vegetables grown without pesticides or chemicals, also known as organic fruits and vegetables.
2. I make a special effort to buy paper (e.g., toilet paper, Kleenex, paper towel) and plastic products that are made from recycled materials.
3. I have attended meeting(s)/seminar(s) related to environmental protection.
4. I have switched products for ecological reasons.
5. I make a special effort to buy household chemicals such as detergents and cleansing solutions that are environmentally friendly.
6. I have signed a petition in support of promoting the environment.
7. I take steps to reduce the amount of electricity I use. e.g., unplug electric appliances which is not being used, and turn off the light unnecessary.
8. When I have a choice between two equal products, I purchase the one less harmful to other people and the environment.
9. I bring my own bag when shopping.
10. I try to limit consumption of water.
11. I keep garbage in separate piles of glass, plastic, paper, newspapers and metal for recycling.
12. I have contributed money to support an environmental group or organization.
13. I have avoided buying a product because it had potentially harmful environmental effects.
14. I have written a letter to the government (or congressman) about the environment.
15. I have written a letter to the editor of a newspaper about the environment.
16. I use a recycling center or in some way recycle some of my household trash.
17. I try to reduce the amount of paper used or produced.
18. I use public transportation, carpools, or a bicycle instead of a car, in an effort to save energy and reduce air pollution.
19. I have purchased brands packaged in recyclable or reusable containers.

Section IV: Effectiveness

Endpoints: Strongly Agree/Strongly Disagree

1. There is not much that I can do about the environment.
2. I feel personally helpless to have much of an impact on a problem as large as the environment.
3. I don't feel I have enough knowledge to make well-informed decisions on environmental issues.
4. I feel capable of helping solve the environment problems.
5. I can protect the environment by buying products that are friendly to the environment.
6. I feel I can help solve natural resource problems by conserving water and energy.
7. Each person's behavior can have a positive effect on society by signing a petition in support of promoting the environment.

Section V: Group Interactions

Endpoints: Extremely Important/Extremely Unimportant

1. I sacrifice self-interest for my group.
2. I act as fellow group members would prefer.
3. I stick with my group even through difficulties.
4. I maintain harmony in my group.
5. I respect the majority's wish.
6. I support my group, whether they are right or wrong.
7. I respect decisions made by my group.
8. I remain in my group if they need me, even though dissatisfied with them.
9. I avoid arguments within my group, even when I strongly disagree with other members.
10. I make an effort to avoid disagreements with my group members.

Section VI: Product Attitudes

To me *laundry detergent* is:

1. Important/Unimportant
2. Boring/Interesting
3. Relevant/Irrelevant
4. Not needed/Needed
5. Exciting/Unexciting
6. Means nothing/Means a lot to me
7. Appealing/Unappealing
8. Fascinating/Mundane
9. Worthless/Valuable
10. Involving/Uninvolving
11. Who usually buys laundry detergent in your household?

To me *toilet paper* is:

1. Important/Unimportant
2. Boring/Interesting
3. Relevant/Irrelevant
4. Not needed/Needed
5. Exciting/Unexciting
6. Means nothing/Means a lot to me
7. Appealing/Unappealing
8. Fascinating/Mundane
9. Worthless/Valuable
10. Involving/Uninvolving
11. Who usually buys toilet paper in your household?

To me *fruits and vegetables* are:

1. Important/Unimportant
2. Boring/Interesting
3. Relevant/Irrelevant
4. Not needed/Needed

5. Exciting/Unexciting
6. Means nothing/Means a lot to me
7. Appealing/Unappealing
8. Fascinating/Mundane
9. Worthless/Valuable
10. Involving/Uninvolving
11. Who usually buys fruits and vegetables in your household?

Section VII: Product Characteristics

Endpoints: Strongly Important/Strongly Unimportant

Laundry detergent

1. Type (e.g., powder or liquid)
2. Scent
3. Nonpolluting ingredient (biodegradable)
4. Price
5. Safe for colors
6. Removal of tough stains
7. Range of size available (oz.)
8. Prior use of the product

Toilet Paper

1. Roll size (e.g., double roll or single roll)
2. Price
3. Thickness
4. Softness
5. Absorbent
6. Made from recycled paper
7. Range of package sizes available (# of rolls)
8. Prior use of the product

Fruits and Vegetables

1. Freshness
2. Price
3. Organically grown
4. Nutritional value
5. Taste
6. Place of origin
7. Range of size available (lb.)
8. Prior use of the product

Section VII-2: Attitudes Toward Each Attribute

Rank From Most Important (1) to Least Important (8)

Laundry detergent

1. Type (e.g., powder or liquid)
2. Scent
3. Price
4. Nonpolluting ingredient (e.g., biodegradable)
5. Safe for colors

6. Removal of tough stains
7. Range of size available (oz.)
8. Prior use of the product

Toilet Paper

1. Roll size (e.g., double roll or single roll)
2. Price
3. Thickness
4. Softness
5. Absorbent
6. Made from recycled paper
7. Range of package sizes available (# of rolls)
8. Prior use of the product

Fruits and Vegetables

1. Freshness
2. Price
3. Organically grown
4. Taste
5. Nutritional value
6. Place of origin
7. Range of size available (lb.)
8. Prior use of the product

Section VIII: Demographic Information

1. Racial or ethnic identification: Asian/Pacific Islander, White, Black, Chicano/Hispanic, Native American
2. American Citizen:Yes/No
3. Undergraduate/Graduate
4. Major(s)
5. Age
6. Sex: Male/Female
7. Residence: On campus/Off campus

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