

To buy or not to buy? A social dilemma perspective on green buying

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Abstract

Purpose – The purpose of this paper is to draw on social dilemma theory and reference group theory to explain the attitude-behavior inconsistency in environmental consumerism. This research seeks to better understand why, despite concern towards the environment (attitude), consumers fail to purchase environmentally friendly or green products (behavior).

Design/methodology/approach – A survey instrument was developed that used scales to measure eight independent and one dependent variable. In addition, socio-demographic data were also collected about the study participants. To discriminate between green and non-green buyers, classification with discriminant analysis was used.

Findings – The framework presented contributes to the environmental consumerism literature by framing the attitude-behavior gap as a social dilemma and draws on reference group theory to identify individual factors to help understand the gap and suggest ways in which to bridge it. Results from the study reveal that several characteristics of the individual – trust, in-group identity, expectation of others' cooperation and perceived efficacy – were significant in differentiating between "non-green" and "green" buyers.

Practical implications – The results of the study offer several managerial implications. First, marketers should reinforce the role trust plays in solidifying collective action. Second, because of the strong influence of reference groups in green buying, marketing communications managers should use spokespeople who are relatable. Third, the study showed that expectation of others' cooperation significantly identifies green buyers. Fourth, to address the perception of personal efficacy, it is important that green marketers emphasize the difference that individual action makes for the collective good.

Originality/value – The research draws on both social dilemma and reference group theories to investigate the determinants of and the mechanisms to explain the rationale behind the attitude-behavior gap as it pertains to a specific environmental issue – energy conservation.

Keywords Environmental politics, Buying behaviour, Consumer behaviour, Influence

Paper type Research paper

An executive summary for managers and executive readers can be found at the end of this article.

Introduction

The industry for green products is estimated at over \$200 billion in 2006. The documentary on global warming, *An Inconvenient Truth*, as well as celebrities speaking in defense of green living, has spurred interest in issues surrounding environmental conservation and protection in the marketplace (Mintel, 2006). This current wave of interest in environmental conservation is not a new phenomenon with research and opinion polls from a decade ago (Roper Organization, 1992) having shown that American consumers are concerned about the environment. However, the same research also revealed that despite expressing concern towards the environment the consumers were

unwilling to purchase or pay a higher price for environmentally friendly products (Jay, 1990; Ottman, 1992; Schlossberg, 1991). A more recent report by the RoperASW (2002) produced somewhat disappointing results with overall environmental concern among the general population on a decline with 59 per cent of the general population not even thinking of participating in environmentally friendly activities. Despite a waning interest in overall environmental protection, the same poll surprisingly revealed that contrary to the above pattern, Americans were willing to purchase and even pay more for specific products that help conserve energy or are less polluting, such as energy efficient appliances, hybrid cars and electricity.

These mixed results reveal a challenging consumer environment for marketers of environmentally friendly consumer products, i.e. green products who seek guidance on "how to" identify and effectively market environmental friendly products to the green consumer segments (Osterhus, 1997). At the same time, research to date has failed to answer the puzzling question about why despite concern towards the

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environment (attitude) consumers fail to purchase environmentally friendly or green products (behavior)?

The objective of this paper is to investigate the above attitude-behavior dilemma in green buying. This research argues that the attitude-behavior gap in environmental consumerism exists because it presents a social dilemma to the consumers. For a small subset of consumers who are “true believers” in environmental protection and conservation, the personal importance of the environmental issue is likely to ensure unconditional participation. However, most consumers, despite holding a positive attitude toward environmental conservation make purchase decisions to maximize self-interest because in their view, the costs of cooperation outweigh the uncertain utility obtained from it. Therefore, the decision to buy (collective social gain) or not buy (self-interest) the green product despite positive attitude towards environmental conservation may be conceptualized as a social dilemma.

This paper also draws on reference group theory that suggests that consumer decision to make the trade-off between such self and collective group interests may also be dependent on the pressure to comply with the expectations and behaviors of significant reference groups (e.g. environmentally friendly group’s choice to cooperate and therefore buy green products). Consequently, this research draws on both social dilemma and reference group theories to investigate the determinants of and the mechanisms to explain the rationale behind the attitude-behavior gap as it pertains to a specific environmental issue – energy conservation. The issue of energy conservation has been studied as a social dilemma (referred to as a resource conservation dilemma), where the short-term incentive to consume the energy resource leaves a long-term undesirable consequence of shortage and higher prices for everyone (Komorita and Parks, 1996). Such a resource conservation dilemma arises when the rate of resource consumption by the group exceeds the supply or replenishment rate (Kramer and Goldman, 1995). In order to conserve this resource, consumers find themselves in a social situation where they are forced to make tradeoffs between bearing the costs of their personal sacrifice and the benefit of cooperative behavior for the group (Messick and Brewer, 1983).

Conceptual background

This section presents a brief background of the attitude-behavior gap in environmental consumerism followed by a review of the theory in social dilemma. Next, a conceptual framework that identifies consumers’ individual attributions regarding cooperation in a social dilemma, particularly, in-group identification, social value orientation, trust, personal efficacy and the costs of purchasing and consuming a green product (i.e. preference and substitutability of the product) on their decision to buy energy efficient products is presented.

Attitude-behavior inconsistency in environmental consumerism

For marketers of green products, the gap between pro-environmental attitudes and green purchase behavior is a daunting challenge where, an attitude is defined as “an enduring set of beliefs about an object that predisposes people to behave in particular way toward the object” (Weigel, 1983 p. 257). Theory in the area of consumer attitude argues that

individuals behave in ways consistent with their attitudes. However, research in environmental consumerism has produced inconclusive evidence in support of consumer attitude theory with mixed results that support both a positive relationship between attitude toward the environment and behavior (Arbuthnot, 1977; Kellgren and Wood, 1986) as well as weak relationships (Mainieri *et al.*, 1997; Tanner and Kast, 2003; Webster, 1975; Wicker, 1969). A more recent study by Mintel (2006) resonates earlier results and found that despite pro-environmental attitudes, intention to recycle, concern about car pollution and willingness to pay more for environmentally-friendly products, few consumers translated these attitudes into regular green buying behavior. These inconclusive results therefore compound the challenge for green marketers who struggle to correctly identify the green consumer segment. In order shed light on this dilemma, it is important to review the literature on the processes and variables that shape consumer attitudes. The section next presents a brief summary of predominant consumer attitude theory followed by a review that highlights explanations offered by researchers to understand the attitude-behavior inconsistency.

The attitude-behavior link

Consumer behaviorists have long stressed on the ability of attitudes to predict peoples’ action. A number of situational and dispositional factors have been suggested that improve the predictive ability of consumer attitude. For example, attitudes have been shown to significantly predict behavior when:

- the person ascribes to a specific personality type with a “high need for cognition” (Cacioppo *et al.*, 1986);
- relevant attitudes are consistent with the beliefs (Norman, 1975); and
- attitudes are based on high levels of issue specific knowledge and/or personal experience (Davidson *et al.*, 1985; Fazio and Zanna, 1981; Smith and Swinyard, 1983) and others (see Ajzen, 1989 for review).

Research also shows that a number of methodological issues should be addressed if attitudes are to predict behavior. For example, attitude and behavior should be measured at the same level of correspondence (Ajzen and Fishbein, 1977) and at the same time (Davidson and Jaccard, 1979) among others (see Petty *et al.*, 1991) for review).

Several theories explain the process by which attitudes predict behavior. First, the “theory of reasoned action” (Ajzen and Fishbein, 1980, p. 5) assumes that “people consider the implications of their actions before they decide to engage or not engage in a given behavior”. As a result, people form intentions to perform behaviors which in turn stem from a person’s attitude towards the behavior as well as his or her perception of others’ opinions (social norms). The model primarily argues that people engage in processing that leads to the formation of attitudes, norms and intentions prior to performing the behavior. A criticism of the theory of reasoned action was that some studies failed to support the link between behavioral intention and behavior and attributed the inconsistency to the lack of control over a person’s action. Therefore to address the above limitation, the “Theory of planned behavior” (Ajzen, 1988; Ajzen, 1991) extends the theory of reasoned action by including a new component, “perceived behavioral control”. This concept originates from the self efficacy theory (SET) and is similar Bandura’s (1982)

concept of self-efficacy which refers to the belief that one can successfully execute a behavior required to produce an outcome. Perceived behavioral control is the subject's perception of the ease or difficulty of performing the behavior. Generally, behaviors that are perceived to be easier to perform will be completed over difficult behaviors. Perceived behavioral control is also linked to control beliefs which are beliefs about the presence of factors that may hinder or help performance of a behavior. Therefore, the intention to perform a behavior is enhanced under conditions of favorable attitude towards the behavior and subjective norm and greater perceived behavioral control. The model also suggests that when a person is given a sufficient degree of actual control over the behavior, he/she will be expected to carry out the behavioral intention (Ajzen, 2002). By including the behavioral control component in attitude theory researchers are able to explain complex behavior which is often dependent on performance of other behaviors (Conner and Armitage, 1998), such as is the case with ecological behavior (Hines *et al.*, 1986-1987; Kaiser *et al.*, 1999).

In contrast with the theories of reasoned action and planned behavior, Fazio (1986) has proposed that attitudes guide behavior through an automatic and spontaneous process instead of a deliberate one as argued by the earlier two theories. According to Fazio (1989), two conditions dictate the likelihood that behaviors will be consistent with attitudes, when:

- 1 the attitude is accessed spontaneously by the mere presence of the attitude object; and
- 2 the attitude influences the perception of the object so that when the attitude is favorable (or unfavorable) the traits of the object are also perceived as favorable (or unfavorable).

Despite theoretical reasoning presented above that suggests the attitude-behavior link, the predictive ability of attitude in the domain of environmental consumerism has been debatable. Researchers have attempted to explain this inconsistency between attitude and behavior by attributing it to a number of factors: low correlations among environmental behaviors, different levels of specificity in the attitude-behavior measures, effects of external variables and lack of measurement reliability and validity (Mainieri *et al.*, 1997). Past research has shown that pro-environmental behaviors performed by the same individual are not significantly correlated (Tracy and Oskamp, 1983-1984) where an individual who performs one type of such behavior, e.g. carpooling is also expected to engage in other similar behaviors such as recycling. Lack of measurement specificity between attitude and behavior suggests that the inconsistency exists as a result of researchers failing to measure behavior-specific attitude instead focusing on a generalized view of environmental attitude (Mainieri *et al.*, 1997) and behavior. Therefore, it has been recommended that in order to predict specific behavior, i.e. purchase of green products, the attitudes measured need to be pointed at a specific environmental issue (Heberlein and Black, 1976; Weigel *et al.*, 1976). Additionally, personal (knowledge, motivation or attitudes) and situational (social norms, other attractive choices or economic constraints) factors may also confound the relationship between environmental attitudes and behavior (Mainieri *et al.*, 1997).

In summary, a review of the literature in environmental consumerism reveals a unanimous pessimism regarding the

ability of general environmental attitudes to predict purchase behavior (Berger and Corbin, 1992) with agreement that attitudes are more likely unrelated or slightly related to overt behavior (Wicker, 1969). Therefore, based on the explanations offered by earlier researchers and the growing significance of green products in today's market place, this paper seeks to explain the attitude-behavior inconsistency by framing it as a social dilemma and subsequently highlight factors borrowed from the literature to discriminate between green and non-green buyers. Next, the theory on social dilemma is explained in context of a specific environmental issue – energy conservation.

Energy conservation as a social dilemma

Social dilemmas are situations in which members of a group face a choice either to cooperate in order to maximize group gain or to defect for self interest (Messick and Brewer, 1983). In such a situation, “each individual receives a higher payoff for a socially defecting choice than for a socially cooperative one, yet all individuals have a higher payoff if all cooperate than if all defect” (Dawes, 1980, p. 173). The choice to defect is the optimal choice (Messick and Brewer, 1983) since each individual is better off acting in his or her own self-interest regardless of what the other group members decide, but in doing so all individuals are worse off than if they had cooperated towards collective gain (Hardin, 1968; Kollock, 1998; Komorita and Parks, 1996). This “tragedy of the commons” was first suggested by Hardin (1968). Schultz and Holbrook (1999) call for development of marketing solutions to the commons dilemma, especially in environmental marketing.

Dawes (1980) cites the example of when citizens are asked to lower thermostats in order to conserve energy to illustrate the concept of a social dilemma. An individual who chooses to defect in self interest will keep the thermostat high and not suffer from the cold. However, if all individuals choose to defect and decide to keep their thermostats high, then everyone will be worse off as the energy supply runs out and everyone has to suffer from the cold. Such examples of resource dilemma point to the issue of social interdependence in which all participants have identical incentive structures and as a result the cumulative consequence of each individual responding to the incentive leads to a disastrous outcome for the larger group (Messick and Brewer, 1983).

Social dilemmas are defined by three properties (Dawes, 1980; Messick and Brewer, 1983; van Lange *et al.*, 1992):

- 1 a non-cooperative choice guided by self-gain is more rewarding to the individual than a cooperative one, irrespective of the decision made by other members of the group;
- 2 relative to a cooperative choice, a non-cooperative choice is always detrimental to the others in group; and
- 3 in a non-cooperative choice, the collective harm to the group is greater than the gain to the individual.

Thus, social dilemmas involve the interplay between selfish motives and cooperation that requires individual sacrifice in the short run for the benefit of all individuals in the long run.

Cooperation in social dilemmas: factors that influence green buying

This paper uses social dilemma theory to explain the attitude-behavior gap inconsistency in environmental consumerism.

The framework in this paper suggests that the difference between green and non-green buyers will depend on certain key factors related to the individual: social value orientation, trust in others, reference group influence (in-group identity, expectation of others' cooperation) perceived efficacy and factors that influence the costs of cooperation to the individual (product substitutability and product preference).

Social value orientation

Research to understand the choice in a social dilemma to cooperate or defect is also influenced by pre-existing individual differences such as social value orientations. Social value orientations are "...preferences for particular distribution of outcomes to oneself and others" (Messick and McClintock, 1968; van Lange *et al.*, 1992 p. 17). The three most prominent social value orientations are (Kramer and Goldman, 1995; van Lange *et al.*, 1992):

- 1 cooperation which is the tendency to maximize both self and others' outcomes;
- 2 individualism which focuses on self gain; and
- 3 competition which stresses on relative gain for self over others.

In the case of resource conservation dilemma, co-operators are more likely to reduce personal consumption of the resource and therefore, resist the temptation to defect than individualists or competitors. Therefore, it is suggested that:

- H1. Social value orientation is a significant discriminating variable between green and non-green buyers.

Trust

In addition to social value orientations, individual differences in trust have also been studied in social dilemma literature. Individuals have been found to differ in their willingness to believe that others are honest or dishonest and as a result trusting others is risky or not (Yamagishi, 1988). It is suggested that such differences in trust has a strong bearing on the decision to cooperate or defect in social dilemmas, where, high-trusters are more likely to cooperate than low-trusters (van Lange *et al.*, 1992). Therefore, it is expected that:

- H2. Likelihood to trust is a significant discriminating variable between green and non-green buyers.

A key factor that influences consumers' decision to cooperate rather than defect is the conformity pressure they are likely to feel, both internally and from external sources, to make choices similar to those made by other group members (Komorita and Parks, 1996). Though social dilemma research has suggested that group size and communication influences individual choice to cooperate (Messick and Brewer, 1983), not much research has investigated into for whom and why such conformity pressure exists. This paper draws on reference group theory to explain the above phenomenon.

Reference group influence

A reference group is a person or a group that influences another person's decision. A person uses reference groups as a basis of comparison in forming affective and cognitive responses (Peter and Olson, 1999). Reference group influences has been widely used in the social sciences and numerous researches have examined reference groups in a consumer context. Because of the role of influence, reference groups can greatly impact behaviors. In addition, reference

groups are an important source of product information, meaning and brand selection (Bearden and Etzel, 1982; Childers and Rao, 1992; Escalas and Bettman, 2005; Moschis, 1985). The use of cultural heroes such as sports or television/film celebrities in endorsing products and services illustrate the belief that individuals who belong to a group to which other individuals aspire enact self-concept development, contribute to the formation of values and attitudes and influence purchase decisions (Bearden and Etzel, 1982; Childers and Rao, 1992; Sheth *et al.*, 1999). Reference group influence can be informational, utilitarian and value-expressive (Park and Lessig, 1977). Informational influence provides information to consumers that enhance knowledge or help the individual cope with the environment. Utilitarian influence occurs when the reference group mediates rewards and punishments. This is especially effective if the person believes his behavior will be public. Finally, value-expressive influence related to an individuals' self-concept. Value-expressive reference groups are used to bolster one's ego. In addition an individual may be influenced by value-expressive groups because he/she likes a particular group. All three types of influence can place pressure on a person to alter their behavior and strengthen or lessen the attitude – behavior inconsistency.

It is expected that reference group will influence green purchase behavior. If a group to which a person belongs or aspires to belong, displays behaviors congruent with their pro-environmental attitude, the individual is under more pressure to conform. In contrast when a reference group does not display congruent behaviors, the individual is less likely to translate their own behavior into action.

In-group identity

Research in social dilemma has demonstrated that enhancing in-group identity promotes cooperation in resource conservation dilemmas (Kerr, 1995). In an experiment, Dawes *et al.* (1977) found that when a member of a group had the opportunity to discuss the dilemma with the others, individuals were less likely to defect in pursuit of self interest. Within group communication fosters a greater likelihood of cooperation because of several factors (Messick and Brewer, 1983):

- establishes group norms and induces conformity pressures;
- enhances individual belief that others in the group are committed to cooperate;
- provides the opportunity to persuade members who might originally be inclined to defect by stressing on moral values to enhance collective gain; and
- builds a sense of group identity among members.

However, it has been indicated that the external validity of this finding in the case of real world dilemmas is somewhat limited since in a large collective society, members do not have the opportunity to discuss their choices with each other. Messick and Brewer (1983) and van Lange *et al.* (1992) suggest that one way to reap the benefits that stem from group communication is to foster social group identity. Research in the area of social categorization (Tajfel, 1981) suggests that salience of membership with a group fosters cooperation among its members. It has been suggested that when individuals strongly identify with a group, they are more likely to make decisions that are driven by collective rather than self interests (Kramer and Goldman, 1995). Simple

awareness of identity with the group increases conformity pressures to cooperate despite the absence of opportunity to discuss individual choice with the others (also Kollock, 1998). Individuals who identify with an in-group cooperate because they perceive other group members as trustworthy, honest and cooperative. They feel that their actions are representative of the group which increases awareness of the impact of individual choice by enhancing the degree of personal responsibility to maximize collective gain (Messick and Brewer, 1983). In addition, the perception of group identity also leads to the feeling of “we-ness” which reinforces social control and self-restraint when faced with the temptation to defect in a resource dilemma situation (van Lange *et al.*, 1992). Therefore, making group identity salient to the individual or increasing his awareness of his belongingness to the group has been shown to increase cooperation (Kollock, 1998). Two views explain how group identity influences cooperative behavior in social dilemmas (Kollock, 1998):

- 1 the process of categorization as suggested by social identity theory (Tajfel, 1981); and
- 2 belief of interdependency among the members and expectations of reciprocity among others (Yamagishi and Kiyonari, 2000).

Based on the above discussion, it is suggested that:

- H3.* In-group identity is a significant discriminating variable between green and non-green buyers.

Expectation of others' cooperation

Both social dilemma theory and reference group theory suggest a strong interrelationship between people's expectation of overall cooperation from the group members and their own decision to cooperate (Dawes, 1980; van Lange *et al.*, 1992). In social dilemmas, people are more likely to cooperate if they expect others to do the same and choose to not cooperate in order to protect themselves from being a “sucker.” Several explanations have been offered to explain the expectation-choice relationship (van Lange *et al.*, 1992):

- social norms play an instrumental role in social dilemma and individuals infer these norms when made aware of others' expectations;
- the tendency to conform;
- their own intended choice being the cause; and
- *post hoc* justification to explain choice in terms of others' expectations.

Therefore, it is suggested that:

- H4.* Expectation of others' cooperation is a significant discriminating variable between green and non-green buyers.

Perceived efficacy

Social dilemma research suggests that cooperation hinges on individuals' perceived efficacy, “. . . or the extent to which one believes that his or her own contributions help to achieve the collective goals” (van Lange *et al.*, 1992 p. 18). Studies reveal that individuals are less likely to defect or free ride if they believe that their cooperative actions will “make a difference” for the betterment of the common good (Sen *et al.*, 2001). This construct has also received attention in the environmental behavior literature (Berger and Corbin, 1992; Ellen *et al.*, 1991; Kinnear *et al.*, 1974). However, despite

producing positive results in experimental setting, Olson (1965) and Kerr (1989) show that perceived efficacy declines with group size and therefore, individuals in a large-scale social dilemma situation (i.e. energy conservation dilemmas) are more likely to defect than to cooperate. Therefore, in addition to previous studies that have examined the direct influence of perceived efficacy to explain green buying behavior (Berger and Corbin, 1992; Ellen *et al.*, 1991; Kinnear *et al.*, 1974) in large group settings (that suffer from lack of external validity), this study will also examine the indirect influence of perceived efficacy. It is suggested that individuals' perceived efficacy is likely to interact with their expectations of others' cooperation in moderating the relationship between pro-environmental attitude and behavioral intent. Specifically, when consumers believe that an individual's contribution will make an insignificant difference towards energy conservation (i.e. low efficacy) their pro-environmental attitudes will predict purchase intent largely under the influence of their expectations of others' cooperation. This is because consumers, under low efficacy conditions, are uncertain about the impact of their individual contribution and tend to be more inclined to others' opinions to guide their own decision (van Lange *et al.*, 1992). However, if consumers feel that their individual contribution will make a significant impact in energy conservation (i.e. high efficacy) then their expectation of others' cooperation will be less relevant in the attitude-behavior relationship. In other words, when consumers believe that they themselves can make a difference by cooperating, their likelihood of doing so is likely to be less contingent on how others behave (Wiener, 1993). Thus, it is expected that perceived efficacy will interact with expectation of other's cooperation in explaining green purchase behavior:

- H5a.* Perceived efficacy is a significant discriminating variable between green and non-green buyers.

- H5b.* The moderating influence of the effect of expectation of others' cooperation on green purchase behavior will be greater when perceived efficacy is low than when it is high.

Factors influencing the costs of cooperation

From a broader perspective, social dilemmas may be conceptualized in the context of social exchange theory (Thibaut and Kelley, 1959) that makes two assumptions:

- 1 all social interactions involve some type of bargaining relationships where people trade rewards and costs; and
- 2 people are always motivated to maximize rewards and minimize costs (Komorita and Parks, 1996).

As a result, social dilemma research acknowledges the pivotal role played by the costs associated with cooperation, where, individuals are required to make tradeoffs between accepting the cost of cooperation and the benefits that their cooperative behavior will produce for the group (Messick and Brewer, 1983). Apart from suggesting the type of costs such as loss of self-esteem, anxiety and guilt (Komorita and Parks, 1996) surprisingly little research has explicitly explored the effects of individual costs on cooperation.

If consumer boycotts are a form of social dilemma (Sen *et al.*, 2001), two factors borrowed from this literature are argued to influence the costs that consumers incur in their decision to cooperate in a resource dilemma. The first factor

stems from consumers' intrinsic preference for the green product: consumers with higher (versus lower) preference for green products will more likely cooperate and subsequently purchase green products. In this situation, the overall preference for the green product reduces the perception of individual cost of cooperating in a social dilemma. A second factor is related to consumers' perception of substitutability between the conventional and green products. When consumers perceive green and conventional products as substitutes, they will be more likely to purchase green products. In this case, the costs incurred to cooperate (i.e. buy the green product) is minimal if not non-existent to the consumer. However, in the event when green and conventional products are not perceived as substitutes, the likelihood that consumers will defect is high. This is the case because the cost of cooperation by buying a product that is an unacceptable substitute of the conventional version presents a big cost to the individual who will attempt to alleviate this cost by defecting and purchasing the conventional product.

According to social dilemma theory, the decision to not cooperate stems from their unwillingness to being seen as a "sucker" (see Komorita and Parks, 1996 for review), while the choice to cooperate leads to personal loss on account of "free riders" (i.e. non-cooperators who benefit from others' cooperation) benefit from individual's cooperation for collective gain. Research (van Lange *et al.*, 1992) suggests that consumers will be more willing to cooperate, despite free riders, when the costs of cooperation to be incurred by the individual are lower. Thus, when consumers' cost of cooperation is low (i.e. they perceive green and conventional products as substitutes or their product preference for conventional product is low), they less likely to be concerned about the issue of free riding and subsequently be more willing to cooperate. Conversely, when consumers' cost of cooperation is high (i.e. no substitutes for conventional products are available or product preference for conventional products is high), they are more likely to be concerned about being perceived as a "sucker," and will consequently be unwilling to cooperate.

H6a. Perception of substitutability is a significant discriminating variable between green and non-green buyers.

H6b. Product preference for green products is a significant discriminating variable between green and non-green buyers.

In the next section, the above hypotheses are tested empirically to support the argument made in the paper that the attitude-behavior gap in environmental consumerism exists because it presents a social dilemma to the consumers.

Study design

In order to test the hypothesized relationships, a survey instrument was developed that used scales to measure eight independent and one dependent variable. In addition, socio-demographic data was also collected about the study participants.

A pilot study was conducted with 29 undergraduate business students who were debriefed regarding the questionnaire items and the objective of the study. After completing the survey, students provided feedback on instructions that needed additional clarification, section

layout and order. Discussion with students allowed the researchers to modify the survey by re-arranging the question order both within a section and in the survey and providing easy to follow instructions to complete each section of the survey.

Independent variables

The scales utilized for the study were taken from existing literature. All responses for the interval scales with the exception of in-group identity and social value orientation were made on a seven-point Likert scale ranging from 1 = strongly disagree (negative) to 7 = strongly agree (positive).

Social value orientation

For this categorical variable, participants had to complete a cognitive task (Van Lange *et al.*, 1997) with nine choice situations where they had to select the most preferred option for themselves. Based on the choices made, participants were classified as co-operators, individualists or competitors. For the purpose of this study, any subject who made six or more consistent choices to be classified as a co-operator was coded as "1". The others that included individualists and competitors along with participants who made choices that were inconsistent with any of the three social value orientation classification schemes were coded as "0".

Trust

Four scale items (De Cremer and Stouten, 2003) with two reverse scored were used to measure this construct. Items included statements such as: "I trust that others buy CFLs; I do not trust that others will buy CFLs; I think that others trust me to buy CFLs and, I think that others do not trust me to buy CFLs" were measured on a seven point Likert scale (1 = strongly disagree and 7 = strongly agree). A Cronbach alpha score of 0.696 showed that the scale was reliable.

In group identity

To measure this variable subjects were asked to read a narrative profile of an average consumer and a celebrity, both committed to purchasing green products. Next, six pairs of circles that visually presented six different representations of identity overlap were presented to the participants (Aron *et al.*, 1992). In each pair, the blue circle represented the identity of the participant and the red circle represented the regular or celebrity consumer. First, subjects were asked to pick the pair of circles that best expressed their perception of identity overlap between themselves and the average consumer. Next, the similar set of circles was presented and the subjects performed the same choice task to indicate their perception of identity overlap between the self and the celebrity consumer. For each of the two measures of group identity, subjects who picked pairs 1, 2 and 3 (distantly spaced circles) were coded "0" (low group identity) while the subjects who selected pairs 4, 5 and 6 (closely overlapping circles) were coded "1" (high group identity).

Expectation of others' cooperation

Two items (Wiener and Doescher, 1994): "In time, most household consumers will purchase CFLs" and "Most people are willing to make sacrifices to help conserve energy" measured this construct by recording participants' (dis)agreement on a seven point Likert scale. Cronbach's alpha score was 0.578.

Personal efficacy

Two scale items (Ellen *et al.*, 1991): “There is not much that any one individual can do about energy conservation”, and; “The energy conservation efforts of one person are useless as long as other people refuse to conserve” were reverse scored on a seven point Likert scale. Cronbach’s alpha for the scale was 0.835.

Substitutability

Perception of whether CFLs and regular light bulbs are substitutable products was measured by asking respondents to indicate their view on a seven point semantic differential scale (where 1 = completely different and 7 = identical) for a total of four word pairs that included items such as “Are completely different/Identical”, “Not similar at all/Similar”, “Have few features in common/Have many features in common” and “Are very different/Are not different” (Sujan and Bettman, 1989). Cronbach’s alpha score was 0.896.

Product preference

Three items (Sen *et al.*, 2001) measured on a seven point Likert scale asked respondents to indicate their preference for CFL bulbs. Questions asked included: “How much would you say you like or dislike CFLs?”; “When you buy light bulbs, to what extent do you buy CFLs?”; and, “When you buy light bulbs, to what extent are you “loyal” to CFLs?” A Cronbach alpha score of 0.909 showed that the scale was reliable.

Attitude

Pro-environmental attitude was measured by asking respondents to indicate their view towards energy conservation on a seven-point semantic differential scale for a total of seven word pairs that included items such as Bad/Good, Harmful/Beneficial, Useless/Useful among others. These seven items from *Marketing Scales Handbook* (Bruner *et al.*, 2005) were selected for its close relevance for the question being examined. A Cronbach’s alpha score of 0.886 showed that the scale was reliable.

Dependent variable

The dependent variable, green buyer was measured as a binary variable. In order to identify green buyers from non-green buyers, the survey asked the respondents the following question: “When you buy light bulbs, to what extent do you buy CFLs?” Responses were measured on a seven-point Likert scale with 1 = Never Buy and 7 = Always Buy. From the above, a dichotomous dummy variable that used the polar extremes approach (Hair *et al.*, 1998) was created with respondents who answered 1 and 2 coded as “0” (non-green buyers) and those who answered 6 and 7 coded as “1” (green buyers). All other responses in the middle were eliminated from the dataset for all further statistical analysis. The rationale for polar extremes approach in building a discriminate model is that there is no clear division of characteristics associated with the middle group. Therefore for this study by eliminating the middle group the two extreme groups provide greater insight into which variables account for the differences between green and non-green buyers. After elimination of the middle group, 190 of the 321 respondents were left in the analysis.

Sample

To test the hypotheses, an internet based survey was administered. An online sample ($n = 321$) was recruited

from an internet panel owned by a private marketing research company. A total of 7,028 subjects were invited to participate through e-mail which provided a link to the web survey from which 26 partially and 321 entirely completed the survey. The subjects represented the general population (and were not exclusively university students), contributing to the external validity of the study results. No specific consumer criteria were used to recruit the sample. From the final sample of 190 participants, an additional 16 cases were not usable and subsequently eliminated from final analysis due to missing data. This reduced the final sample for the study to 174 where 59 were classified as non-green buyers and 115 as green buyers.

Further analysis of the demographic data (on the entire dataset, $n = 190$) show that 75 of the respondents were male (43.1 per cent) whereas 99 (56.9.4 per cent) were female. In terms of marital status, 58 (33.3 per cent) were single, 85 (48.9 per cent) were married, 22 (12.6 per cent) divorced, three (1.7 per cent) widowed and six (3.4 per cent) indicated other. Regarding education levels, 36 (20.7 per cent) had high school level education, 62 (35.6 per cent) had trade school or some college, 53 (30.4 per cent) had an associate or undergraduate college degree, and 16 (9.2 per cent) had master’s degree or higher. In terms of household income, 52 (29.9 per cent) indicated less than \$25,000, 57 (32.8 per cent) had between \$25,000 and \$50,000, 28 (16.1 per cent) between \$51,000 and \$75,000, 19 (10.0 per cent) indicated income between \$76,000 and \$100,000, 10 (5.7 per cent) between \$101,000 and \$150,000, and 8 (4.6 per cent) indicated household income over \$151,000.

Finally, in order to assess the respondents’ comfort level with taking an online survey, each was asked to rate his or her technical proficiency with a computer (1 = Not very proficient, 7 = Very proficient) and to report the number of hours per week spent on line, either for work or personal use. Results showed a fairly sophisticated technical group ($M = 4.95$ in proficiency) who spend an average of 22.95 hours per week on line.

Procedure

The survey instrument presented the invited participants with a brief description of the study, procedure, risks and benefits of participation, duration and offered them the opportunity to indicate their willingness to participate. A total of 321 subjects agreed to participate in the study while 15 subjects declined and subsequently were allowed to exit the survey. Next, each of the 321 subjects were asked to read a description of an incandescent light bulb and compact fluorescent light bulb and shown images of each product. Following this introduction, the survey measured presented all the measurement scales for the predictor variables. The survey instrument was programmed in a way that did not allow the respondent to return to the previous web page. Subjects were also required to respond to all questions in a section in order to progress to the next web page. The last page in the survey recorded socio-demographic data and finally thanked the subjects for their participation in the study.

Analysis

The objective of this paper stems from the general consensus in green marketing that unlike other consumption behaviors, consumer attitude is a weak and insignificant predictor of

green buying. Instead, this paper argues that attitude-behavior inconsistency in green buying exists because it presents itself as a social dilemma to consumers. Preliminary analysis of the study generates support for the attitude-behavior inconsistency in environmental consumerism where, the mean of consumer attitude for both the green ($M = 6.74$) and non-green buyer ($M = 6.00$) groups were high (measured on a scale of 1-7) though significantly different ($p < 0.05$).

Therefore, to discriminate and predict green and non-green buyers, classification with discriminant analysis (SPSS software) was used. Discriminant analysis is a multivariate technique used to study the differences between two groups with respect to two or more independent variables simultaneously (Johnson and Wichern, 1998). The sample size ($n = 174$) was large enough to place confidence in the results where 20 subjects per variable is considered adequate for a discriminant analysis (Stevens, 1992).

The classification was based on prior probabilities computed on the basis of group size. Missing values were excluded to provide a more robust analysis. The predictor variables used in the study were social dilemma variables (social value orientation, trust, in-group identity, expectation of others' cooperation, perceived efficacy) and variables related to costs of cooperation (substitutability and product preference). Two separate discriminant analysis models were built to test the hypotheses. The first analysis examined the predictive ability of the social dilemma and reference group influence variables in effectively discriminating between the green and non-green buyers. The second analysis focused on the costs of cooperation incurred by consumers in the purchase of green products (perception of substitutability and product preference) as the discriminating variables.

Results of discriminant analysis with social dilemma variables

Before hypotheses testing, statistical analysis first checked for multicollinearity between the independent variables. One of the key assumptions for discriminant analysis is that high correlation should not exist among the independent variables. It has been suggested that correlation coefficients among the independent variables should be less than 0.75. Table I shows that this assumption was met. Correlation coefficients ranged from 0.005 to 0.268 indicating that multicollinearity is not a concern in the data.

Additional analysis of the data also revealed no serious violation of the assumptions of independence and multivariate normality. To test the assumption of equal variance-covariance, Box's *M*-test statistic was applied. Though an initial examination of the test statistic, Box's $M = 43.087$; $F(21, 52599.285) = 1.963$; $p = 0.005$ suggests a violation of

the equal variance-covariance assumption it is important to note that this test might be sensitive to factors other than covariance differences (e.g. sample size) (Hair *et al.*, 1998). Test results show that the corresponding *F* value is only 1.963, which indicates that the departure from the null is not large (Noble and Schewe, 2003). In addition with large sample sizes when Box's *M* produces unexpected results log determinants of the group covariance matrices provide a better insight. Here, the log determinants are relatively equal at -4.148 and -3.702 , a difference of 0.45 that suggests that the two groups are drawn from the same distribution. Discriminant analysis is robust to the violation of homogeneity of variance assumption as long as there are no extreme outliers in the data (Meyers *et al.*, 2005). An examination of the data revealed no extreme outliers. Descriptive statistics of the groups (green versus non-green buyers) on the independent variables are shown in Table II.

The discriminant analysis model with the social dilemma and reference group influence variables showed that the overall multivariate relationship was statistically significant at the 0.05 level (Wilks' $\Lambda = 0.560$; chi square (6, $n = 174$) = 97.923; $p < 0.001$ indicating that green buyers differed significantly from non-green buyers in reference to the means of the independent variables. The predictive ability of the independent variables in discrimination was also supported by the statistic reflected in the group centroids (-1.230 versus 0.631) that clearly suggests that the two groups are different from each other. The model produced a canonical correlation of 0.663 that indicated that it accounted for 44 per cent of the variance in the dependent variable.

Finally, the univariate *F*-tests of the discriminant analysis (Table III) also indicate that significant differences exist between the means of the green and non-green buyers. With the exception of social value orientation, all other independent variables: trust, in-group Identity (both with average consumer and celebrity), expectation of others' cooperation and perceived efficacy significantly differentiated and predicted membership in the two groups. Therefore, with the exception of *H1*, *H2-H5a* were supported.

Additional support for *H2*, *H3*, *H4*, *H5a* and lack of support for *H1* is seen in the within group correlations between the predictors and the discriminant function as well as the standardized weights (Table IV). Based on these coefficients, expectation of others' cooperation and trust demonstrated the strongest relationship. Identification with a regular consumer, efficacy and identity with celebrity demonstrated moderate relationships. Social value orientation displayed the weakest relationship.

Further analysis examined the performance of the classification procedure (hit rate) as presented in Table V.

Table I Correlation coefficients between the independent variables

	Social value	Trust	In-group identity with average consumer	In-group identity with celebrity	Expectation of others' cooperation	Personal efficacy
Social value	1.000	-0.083	-0.058	-0.077	-0.065	-0.094
Trust	-0.083	1.000	0.117	0.112	0.165	0.246
In-group identity with average consumer	-0.058	0.117	1.000	0.211	0.005	0.268
In-group identity with celebrity	-0.077	0.112	0.211	1.000	0.148	0.225
Expectation of others' cooperation	-0.065	0.165	0.005	0.148	1.000	0.203
Personal efficacy	-0.094	0.246	0.268	0.225	0.203	1.000

Table II Descriptive statistics of the independent variables

Variable	Range of value	Green buyers means (n = 115)	Non-green buyers means (n = 59)	Green buyers standard deviation (n = 115)	Non-green buyers standard deviation (n = 59)
Social value orientation ^a	0 and 1	0.6174	0.5593	0.48815	0.50073
Trust	1-7	4.7630	3.3898	1.10811	1.19740
In-group identity with average consumer ^a	0 and 1	0.7913	0.4237	0.40815	0.49839
In-group identity with celebrity ^a	0 and 1	0.4435	0.1356	0.49897	0.34529
Expectation of others' cooperation	1-7	5.4130	3.8390	1.15330	1.26095
Personal efficacy	1-7	5.7913	4.6017	1.43726	1.46740

Note: ^a Categorical variable

Table III Univariate F-tests for the independent variables

Variable	Wilkes' Λ	F	Significance
Social value orientation	0.997	0.542	0.463
Trust	0.752	56.68	0.000
In-group identity with average consumer	0.864	27.133	0.000
In-group identity with celebrity	0.905	18.012	0.000
Expectation of others' cooperation	0.716	68.147	0.000
Perceived efficacy	0.867	26.338	0.000

Table IV Standardized coefficients and correlations of predictor variables of the discriminant function

	Correlation coefficients	Standardized coefficients
Expectation of others' cooperation	0.601	0.710
Trust	0.485	0.648
In-group identity with average consumer	0.344	0.448
Efficacy	0.093	0.442
In-group identity with celebrity	0.142	0.365
Social value orientation	0.182	0.063

Table V Classification accuracy – social dilemma and reference group influence variables

Actual group	Number of cases	Classification			
		Green buyers		Non-green buyers	
		Number	Percent	Number	Percent
<i>Results for the development sample:</i>					
Green buyers	115	106	92.2	9	7.8
Non-green buyers	59	42	71.2	17	28.8
<i>Results for the validation sample:</i>					
Green buyers	115	104	90.4	11	9.6
Non-green buyers	59	18	30.5	41	69.5

The analysis showed that 85.1 per cent of the cases in the dataset were correctly classified. As a cross-validation, to assess how well the classification procedure would predict in a new sample it is estimated that 83.3 per cent of the cases would be accurately classified using the leave-one-out technique.

In order to take into account chance agreement a Kappa coefficient showed a value of 1.00 indicating high accuracy in prediction ($p < 0.000$) Since the group sizes were unequal, the proportional chance criterion was used to calculate the

chance classification. Hair *et al.* (1998) suggests that the classification should be at least 25 per cent greater than chance for the discriminant function to be meaningful for interpretation. The proportional chance criterion is $[(59/174)^2 + (115/174)^2] = 55\%$. In addition the maximum chance criterion was also calculated. This criterion determines if the results exceed the per cent of respondents that would be correctly classified if all observations were assigned to the segment with the greatest probability of occurrence (Noble and Schewe, 2003). Because non-green

buyers occurred 66 per cent of the time (115/174), it would be correct 66 per cent of the time if all observations were assigned to this group (maximum chance criterion). Because the maximum chance criterion is larger than the proportional test criterion, the model is expected to outperform the 66 per cent level. The classification accuracy of 85.1 per cent is substantially higher than the proportional chance criterion (55 per cent) and the maximum chance criterion (66 per cent). Therefore it can be assumed that the model of the study is accurate.

Finally, to test *H5b* that suggested that green purchase behavior would be predicted by the interaction between expectation of others' cooperation and personal efficacy, a logistic regression was conducted. Results from the binary logit model showed that the interaction term was significant generating support for *H5b*. Results showed a regression coefficient for the interaction term was 0.101, Wald statistic = 33.889, *df* = 1 and *p* = 0.000. The Exp(B) for the interaction term was 1.107.

Results of discriminant analysis with costs of cooperation variables

The assumption that there should be no high correlation among the independent variables held true for the two variables considered in the discriminant analysis model with the variables that measured costs of cooperation. The correlation between substitutability and product preference is 0.022 indicating multicollinearity is not an issue. Further analysis of the data revealed no serious violation of the assumptions of independence and multivariate normality. To test the assumption of equal variance-covariance Box's M-test statistic was applied. Though the result where, Box's *M* = 21.405; *F* (3, 445252.721) = 7.040; *p* = 0.001 suggests a violation of the equal variance-covariance assumption similar group log determinants indicate equal variance covariance matrices. The log determinants are relatively equal at 0.018 and -0.283, a difference of 0.27, suggesting that the two groups are drawn from the same distribution. An examination of the data also revealed no extreme outliers; Descriptive statistics of the two groups (green versus non-green buyers) on the independent variables are shown in Table VI.

The discriminant analysis model with the costs of cooperation variables showed that the overall multivariate relationship was statistically significant at the 0.05 level (Wilks' Λ = 0.094; chi square (2, *n* = 174) = 442.236; *p* < 0.001 indicating that green users differed significantly from non-green users. Thus, overall the two cost of cooperation variables used in the study were able to discriminate between green and non-green users. Further examination of the group centroids clearly suggests that green and non-green users are different from one another (- 4.5284 versus 2.227). The model produced a canonical correlation of

0.952 that indicated that it accounted for 91 per cent of the variance in the dependent variable.

Finally, the univariate *F*-tests of the discriminant analysis (Table VII) showed that significant differences exists in the means of product preference between green and non-green buyers with no difference between the means for substitutability between the two groups. Therefore, the results supported *H6b* but failed to generate support for *H6a*. Additional support for *H6b* and lack of support for *H6a* is seen in the within group correlations between the predictors and the discriminant function as well as the standardized weights (Table VIII). Based on these coefficients product preference demonstrated the strongest relationship. Substitutability displayed a very weak relationship.

Additional analysis examined the performance of the classification procedure (hit rate) as presented in Table IX. The analysis showed that 99.5 per cent of the cases in the dataset were correctly classified. As a cross-validation, to assess how well the classification procedure would predict in a new sample it is estimated that 99.5 per cent of the cases would be accurately classified using the leave-one-out technique. In this case, the classification accuracy 99.5 per cent is substantially higher than the proportional chance criterion (55 per cent) and the maximum chance criterion (66 per cent), indicating an accurate model.

Discussion and contribution

Research in the area of consumer attitude suggests that people behave in ways consistent with their attitudes. However, research in environmental consumerism has produced inconclusive evidence in support of attitude theory. The goal of this research was to explain the attitude-behavior inconsistency in green buying by framing it as a social dilemma to provide an understanding of why consumers do

Table VII Univariate *F*-tests for the independent variables – costs of cooperation

Variable	Wilks' Λ	<i>F</i>	Significance
Substitutability	1.00	0.024	0.877
Product preference	0.094	1811.653	0.000

Table VIII Standardized coefficients and correlations of predictor variables of the discriminant function – costs of cooperation

	Correlation coefficients	Standardized coefficients
Substitutability	- 0.026	- 0.004
Product preference	1.0	1.0

Table VI Descriptive statistics of the independent variables – costs of cooperation

Variable	Range of value	Green buyers means (<i>n</i> = 115)	Non-green buyers means (<i>n</i> = 59)	Green buyers standard deviation (<i>n</i> = 115)	Non-green buyers standard deviation (<i>n</i> = 59)
Substitutability	1-7	3.01	3.05	1.62	1.27
Product preference	1-7	6.45	2.29	0.53	0.80

Table IX Classification accuracy – costs of co-operation variables

Actual group	Number of cases	Classification			
		Green buyers		Non-green buyers	
		Number	Per cent	Number	Per cent
Results for the development sample:					
Green buyers	125	125	100	0	0
Non-green buyers	65	64	98.5	1	1.5
Results for the validation sample:					
Green buyers	125	125	100	0	0
Non-green buyers	65	64	98.5	1	1.5

not purchase green products despite a positive attitude toward the environment. By drawing on theories of social dilemma and reference group influence, this article sheds light on the processes that underlie above consumer resistance (Sen *et al.*, 2001). In summary, this paper suggests that the decision to purchase green products presents itself as a social dilemma influenced by reference group effects and is driven by the motivation to maximize collective rather than individual gain. This article contributes to the understanding of cooperation in social dilemmas in several ways. First, though research in social dilemma literature has suggested that group characteristics i.e. size, cohesiveness and communication impact the likelihood to cooperate, this paper examines the nature of group influence on individual cooperation. By drawing on reference group theory, results from this study show that reference groups influence individual cooperation.

Results from the study reveal that several characteristics of the individual – trust, in-group identity, expectation of others' cooperation and perceived efficacy – were significant in differentiating between “non-green” and “green” buyers. Only one of the variables – social value orientation of the individual – was ineffective in discriminating between the two groups. Findings from the study indicate that green buyers generally are high trusters and expect that others would also engage in green buying behavior. This means that people who exhibit high trust levels will be more likely to buy green products because they believe that others will do the same. This finding supports the research in social dilemma which argues that high trusters are more likely to cooperate than low trusters who are more likely to defect as a result of the tendency to maximize self gain (van Lange *et al.*, 1992).

In-group identity was also significant in discriminating between green and non-green consumers. This finding supports the research in the area of social categorization (Tajfel, 1981) which suggests that individuals who strongly identify with a group are more likely to make decisions or perform behaviors that benefit the group rather than themselves (Komorita and Parks, 1996; Kramer and Goldman, 1995). In such situations, despite an absence of the opportunity to discuss individual choice with the group members, simple awareness of identity with the group enhance conformity pressures to comply with group choice (Kollock, 1998). Results from the study showed that individuals who closely identified with representatives of the green consumer segment – an average green consumer and a celebrity were more likely to cooperate by making green purchase decision. This finding on the predictive influence of in-group identity on green purchase behavior is also explained

by research (i.e. Childers and Rao, 1992) which suggests that consumption decisions are influenced by reference groups.

Expectation of others cooperation was the strongest factor that discriminated between green and non-green buyers. The green buyer made cooperative decision because they expect others to do the same. The non-green buyer has no such expectation, does not feel the pressure to conform and therefore chooses to not cooperate in a social dilemma. This finding is supported by research in social dilemma that suggests that people are more likely to cooperate when they expect others to do the same and avoid cooperation to protect them from being perceived as a sucker.

A surprising finding was that social value orientation was not significant in separating green and non-green buyers. Results from the study showed that more than half of each group members identified themselves as co-operators. An explanation for why an unexpectedly significant proportion of non-green buyers identified themselves as co-operators could be attributed to social desirability bias. In order to measure an individuals' social value orientation, study participants were asked to perform nine choice tasks which measured the tendency to maximize self or collective gain. It might be argued that since this choice task was performed in a hypothetical situation with no personal gain or loss participants might have answered in a socially desirable way instead of choices that are made in a real situation.

Perceived efficacy is the extent to which an individual believes his/her actions make a difference in achieving collective goals (van Lange *et al.*, 1992). This construct was significant and showed moderate influence in discriminating between green and non-green buyers. While both groups believe their actions make a difference, Green buyers have much stronger beliefs ($M = 5.8$) than non-green buyers ($M = 4.6$). Green buyers are less likely to defect in order to maximize self gain because they believe that their cooperation action will contribute to the betterment of the common good (Sen *et al.*, 2001). The predictive influence of perceived efficacy is also supported by research that has received much attention in environmental consumerism literature (Ellen *et al.*, 1991; Kinnear *et al.*, 1974).

Second, this paper extends the assertion made by social dilemma research that highlights the predictive role of perceived efficacy and expectation of others' cooperation on the likelihood to cooperate. Results from this study reveal an interaction between the two factors (Sen *et al.*, 2001) beyond its independent influence to impact cooperation in social dilemma situations. Results from this study show that when perceived efficacy is low the influence of the effect of others cooperation on green purchase behavior is high. Under low efficacy conditions consumers are not certain about the

impact of their actions and tend to use others' opinions to guide their behavior. At the same time, when people believe their actions matter the likelihood of buying green products is less contingent on how others behave.

Third, the results of this study supports earlier research by Sen *et al.* (2001) that identifies the influence of costs of cooperation on the individual decision to cooperate or withhold consumption. However, results from this study showed that only one of the two costs of cooperation variables was significant and contributed to the discrimination between green and non-green buyers. Specifically, the results showed that green buyers overwhelmingly exhibited a higher level of product preference for the green product than non-buyers. Unexpectedly, substitutability was not significant in contributing to the discrimination between green and non-green buyers (see Sen *et al.*, 2001). Results from the study showed that both the green and non-green buyers perceived the green and conventional products as different and hence not substitutable. The findings that failed to support the role of substitutability on the individual decision to cooperate suggests that marketing practice that highlight the parity between the green and conventional product might be ineffective and cooperation in such social dilemmas might require resorting to a structural solution.

Results from this study provide important information to help marketers accurately identify the green buyer segment. The results of the study offer several managerial implications. First, marketers should reinforce the role trust plays in solidifying collective action. Namely using themes such as "you can trust that others will follow your lead" may strengthen the trust consumers feel and subsequently weaken the desire to defect. By relaying messages that show the extent of others' action, consumers will feel confident that their trust is warranted. Such marketing communication will also persuade "low trusters" that it is worthy to believe others are engaging in pro-environmental behavior. Second, because of the strong influence of reference groups in green buying, marketing communications managers should use spokespeople who are relatable. In the event that a green marketer decides to use a celebrity, that person must be perceived as a role model for green behavior. On a related note, since study results showed that identification with a "regular" green consumer was stronger than with a "green" celebrity in discriminating between green and non-green buyers it is an indication for companies to save marketing dollars by using typical green consumers instead of celebrity spokespeople in marketing communications. Third, this study showed that expectation of others cooperation significantly identifies green buyers. For marketers, this finding presents an opportunity to communicate that other consumers make green choices. When people believe that other people similar to themselves make cooperative choices by buying green, they will be more likely to buy green as well. Marketing communication material could also display testimonials of green buyers. However, these messages must be constantly reinforced so that the individual does not feel that they are acting alone. Fourth, to address the perception of personal efficacy, it is important that green marketers emphasize the difference that individual action makes for the collective good. When people realize that their individual green behavior matter, they will be less likely to defect. Therefore in developing marketing messages, emphasis should be placed on how an individual's actions can contribute to the collective gain. These messages will reinforce beliefs that

actions do matter because it makes them feel good about their actions and in turn strengthens perceived efficacy. Also when people believe their actions matter, the likelihood of buying green products becomes less contingent on how others behave. This indicates that people with strong levels of perceived efficacy can become role models for others who are more susceptible to reference group pressure.

Substitutability was not a significant discriminating factor in the analysis indicating that both green buyers and non-green buyers did not perceive the green product (CFL light bulbs) and the conventional product (incandescent light bulbs) as substitutable. Both groups perceived the CFL and regular incandescent light bulbs as significantly different from each other. For green marketers, this result highlights the need to stress the benefits of green products. In the case of CFLs, positioning on product superiority, cost savings, energy conservation, and the lessened frequency of switching light bulbs are areas that could be stressed. In addition, marketers should shift focus from price of the green product to consumer value.

Finally, by using real consumers instead of student populations as is common practice in academic research this study increases the external validity of study results. Thus, green marketers can confidently use key findings of this study to not only identify the green buyer segment but also use this knowledge to make appropriate modifications to marketing strategy to target and subsequently convert non-green buyers to green buyers.

Limitations and future research

Although the strengths of the study outweigh the limitations, this study has potential methodological limitations that also present opportunities for future research. Many of this article's limitations are those found in survey research. For example, the internet was utilized as a delivery mechanism for the survey. Thus, people who do not have a computer or who do not feel comfortable using a computer would not be included in the survey. Future research should widen the base of participants by using other methods to investigate green buying behavior. In survey research much of the validity depends on a subject's ability to accurately assess their level of agreement with questions. Although analysis does not indicate that this is a problem, there may be some level of measurement error. A third limitation of the study was the single product used to measure green buying. The external validity of this study could be increased by future research that seeks to replicate findings of this study by investigating the consumption of other green products.

Other suggestions for future research are tied to the study results. Findings from this research showed that in-group identity is a valuable factor that influences green buying. A future research project might seek to investigate this influence further by examining the concept of source credibility. That is, in addition to identifying with a person how does credibility of the source help or hinder the effectiveness of the message to promote green buying. As suggested earlier, the lack of support for the influence of social value orientation in green buying may be attributed to the way the construct was measured in this study. Future research could develop alternative measurement tools that are more effective in capturing the individual's social value orientation and address any social desirability bias in participant response. A third limitation of the study is tied to the results for the variable –

trust. Social dilemma research argues that despite showing that individual personality differences (level of trust) explain cooperative or defective choices, this knowledge is not very useful as a solution to dilemmas (Kollock, 1998) because it does not shed light on how to increase the level of cooperation. Finally, Messick and Brewer (1983) offer two different types of solutions for a social dilemma: structural approaches that involve changing the structure of the social dilemma and individual solutions that attempt to alter individual choice. These solutions include offering rewards to promote cooperative behavior and enforce punishment or penalty for non-cooperative behavior. Future research in environmental consumerism could investigate which structural and individual solutions would be most effective in achieving its cooperative behavior for collective gain.

Future research should examine the interplay of social dilemma variable and product features on green buying. While energy conservation is a social good – it may be that other aspects of the product affect choice (i.e. aesthetics, safety, price, ease of replacement) and this may be product-dependent.

Conclusion

The conceptual framework offered in this paper directly responds to the need in environmental consumerism literature to explain attitude-behavior inconsistency. The framework presented in this paper contributes to the environmental consumerism literature by framing the attitude-behavior gap as a social dilemma and draws on reference group theory to identify individual factors to help understand the gap and suggest ways to bridge it. Study results are valuable to both practitioners and theoreticians in their effort to better understand the environmentally conscious consumers. For theoreticians, findings from hypotheses testing show that the likelihood purchasing green products depends on certain individual characteristics: trust in others, reference group influence (in-group identity, expectation of others' cooperation, perceived efficacy) and factors that influence the costs of cooperation to the individual (product substitutability and product preference). Since the success of green products is contingent on consumers' tendency to cooperate rather than to defect, it is imperative for green marketers to understand which individual factors encourage cooperation. For green marketers, therefore, the findings from the study help develop marketing strategy that persuades consumers to seek the value of collective gain over self-interest.

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