
Making Sustainable Consumption Choices: A Planned Behavior Approach

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EXECUTIVE SUMMARY

This study examines the antecedents of sustainable choices in the consumption of water bottles: Do people choose reusable water bottles? If so, what are the reasons and influencers? Using the well-established theory of Planned Behavior (Ajzen, 1991), we explore the role of values toward the environment, attitudes toward single use plastic bottles, perception of behavioral constraints to impact intentions to use reusable water bottles and subsequent behaviors. Efforts to influence the non-use of plastics is a global phenomenon and the limited success of these efforts is a source of frustration to policy makers and environmentalists. The theory of planned behavior has been used to study and influence many important societal problems like smoking, wearing seatbelts and not drinking and driving (Norman, Conner, & Bell, 1999). This paper thus has two objectives: one is to test this theory in a new context, which is among Hispanic consumers, thus validating the application of this theory to explain behavior in another ethnic group. Second, this paper hopes to understand the relative importance of the different antecedent variables in explaining the sustainable consumption choices.

Keywords: planned behavior, sustainable consumption, plastics

Importance of Studying Sustainable Consumption Behaviors

The Brundtland Commission (Our Common Future, 1987) defines sustainability as meeting the needs of the present generation without compromising the ability of future generations to meet their own needs. The premise of the United Nations World Summit on sustainable development in Johannesburg in 2002 was that fundamental changes in the way societies produce and consume are imperative to achieve sustainable development and to achieve this goal requires effort from governments, producers, and consumers. Since the focus of our study is the consumer, we address sustainability from a consumer's perspective, namely buying reusable water bottles.

The culture of consumption is the third force responsible for driving both consumption of energy and pollution of the environment. Personal consumption choices, especially among middle- and upper-class people, drive increases in the use of energy and transportation. Most water, land, and atmospheric pollution can be traced to the production and increased consumption of various products. Strong links between industrial production, mass marketing, and pride in consumption emerged in the late nineteenth century, when many sociologists believe the "culture of consumption" originated in the United States. US economist Thorstein Veblen (Trigg, 2001) coined the term "conspicuous consumption" to describe the US trend of displaying luxury items in order to enhance self-esteem, and to exhibit a higher social status. Harvard University economist Juliet Schor (1988) defines contemporary consumer culture as social systems in which "consumer satisfaction, and dissatisfaction, depend less on what a person has in an absolute sense than on socially formed aspirations and expectations [of what material accumulations one should have]" (p. 9).

Plastic waste is a global problem. According to an article written in the National Geographic (Parker, 2019), globally more than a million plastic bottles are sold every single minute. Use of plastic bottle brings into the conversation the issue of recycling. However, data shows that in the US only 30% of the plastic bottles are recycled. The half-life of plastics is 450 years, time required for plastic to be fully degraded. Finally, bottled water requires up to 2000 times more energy than required to produce tap water. The above shows that in every way using single use disposable water

bottles is harmful. This issue warrants study, since the US is the largest consumer of plastic water bottles followed by Mexico, Brazil, and China.

Theoretical Background

An important theoretical framework that guides this research is the theory of planned behavior (TPB) (Ajzen, 1991), stemming from the theory of reasoned action, which suggests that attitudes (A) and subjective norms (SN), mediated by behavioral intention (BI), have impacts on environmental behaviors (H). TPB model adds the perceived behavioral control (PBC) into the theoretical frame (Ajzen, 1991). Taylor and Todd (1997) use TPB to suggest the determinants of participation in waste management programs. Moreover, TPB has been applied to the studies such as household recycling (Kaiser & Gutscher, 2003), the purchasing of energy-saving light bulbs, the use of unbleached paper, water use, meat consumption (Harland et al., 1999), and general pro-environmental behavior.

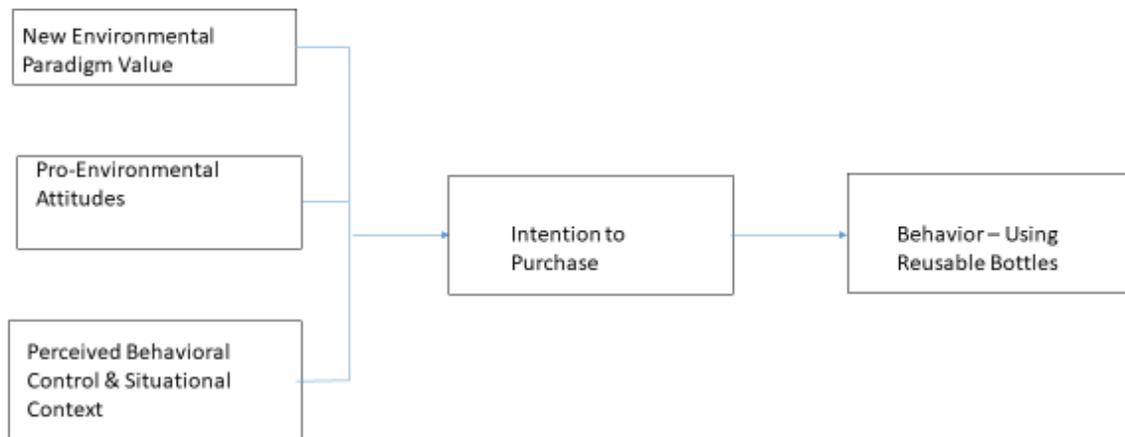
Theory of Planned Behavior

Fishbein and Ajzen's "theory of reasoned action" has generated a good amount of research, which focuses on the link between attitudes and behavior. Of late, researchers have turned to the boundary conditions of the theory of reasoned action (Bagozzi & Kemmel, 1995). Ajzen (1985), arguing that the theory of reasoned action applies strictly to behaviors under total volitional control (e.g., voting in a political election), proposed the theory of planned behavior as an explanation of actions not completely under volitional control (e.g., weight loss). Therefore, "to ensure accurate prediction of behavior over which individuals have only limited control, we must assess not only intention but also obtain estimates of the extent to which the individual is capable of exercising control over the behavior in question" (Ajzen & Madden, 1986, p. 456). Thus, the theory of planned behavior can be thought of as an extension of the theory of reasoned action in that it accounts for behaviors that an individual regards as potentially subject to interferences by internal and external impediments. The theory of planned behavior adds a new predictor of intentions and behavior: perceived behavioral control, which is defined as one's belief as to how easy or difficult performance of a behavior is likely to be (Bagozzi & Kemmel, 1995).

Summary of Conceptual Model

The outcome variables are intention to purchase a sustainable product, a reusable water bottle, and a behavior, actually using one. These two outcomes (intentions and behavior) are conceptualized as being impacted by new environmental values, attitudes toward plastics, and perceptions of constraints in the use of reusable water bottles. This model would demonstrate whether the theory of planned behavior provides a good model to understand intentions and behavior of a sustainable product and to understand the relative importance of the antecedent variables in the Hispanic sample.

Research Model



Study Constructs and Hypothesized Relationships New Environmental Paradigm

It is often suggested that people's values have an influence on their environmental attitudes and behaviors (Stern 2000). According to Rokeach (1973), values act as guideposts for behavior and serve as guiding principles in life. There is an impressive body of research which suggests that pro-environmental behaviors may be influenced by values that transcend self-interest and focus on collective over individual interests. For example, Karp (1996) demonstrated that Schwarz's values were significantly related to recycling behaviors, marketplace behaviors, and political actions aimed at protecting the environment. Poortinga, Steg, and Vlek (2004) studied the role of Quality of Life (QOL) value judgments on household energy use. They found that QOL value dimensions contributed significantly to the explanation of the acceptability of specific home and transport energy-saving measures.

A number of researchers have explored values concerning the environment. Dunlap and Van Liere (1978) posited that a new world view was emerging--one that differed dramatically from the Dominant Social Paradigm which upheld the public's belief in progress and development, science and technology, and a laissez-faire economy. Calling it the New Environmental Paradigm (NEP), the authors assert that this emerging outlook comprised such concepts as limits to growth and natural resource preservation. In this world view, people consider themselves an intrinsic and interdependent part of nature. The NEP implies membership in, not dominion over, the natural world. It recognizes a need to limit growth and achieve a balance with nature, and questions the "rights" of human beings to modify the environment.

H1: There is a positive relationship between environmental values and young adults' intentions to use reusable water bottles.

Pro Environmental Attitudes

Environmental issues have attracted the attention of researchers in the social sciences and marketing (Berger, 1997 and Pieters et al., 1998). Marketers have researched recycling issues in an effort at understanding consumer motivations underlying the purchase of environmentally friendly products and services (Bagozzi & Dabholkar, 1994), exploring the relationship between general psychological constructs and environmental behavior (Biswas et al., 2000), and identifying the antecedents of post-purchase/post-consumption behavior (Alwitt & Pitts, 1996; Shrum, McCarty, & Lowrey 1995). Interestingly, most of the research has been on Anglo consumers and with a small number of studies focusing on African Americans and Hispanics (Howenstine, 1993).

Psychological constructs such as attitudes are important and often researched antecedents because they are more amenable to influence and thus actionable. A well-known attitude in the ecological literature is the concern for environmental problems and a perception of their severity. Ecologically conscious consumers believe that current environmental conditions are deteriorating and represent serious problems facing the security of the world, whereas consumers who are less sensitive to ecological issues perceive that environmental problems in the long run will resolve themselves (Banerjee & McKeage, 1994). Environmental attitudes are conceptualized as abstract orientations and it is argued that sustainable behaviors are influenced by more specific psychological constructs, such as beliefs related to efficacy of behaviors. The above reasoning leads to the following hypotheses:

H2: There is a positive relationship between attitudes toward single use plastic water bottles and young adults' intentions to use reusable water bottles.

H3: There is a positive relationship between attitudes toward single use plastic water bottles and young adults' use of reusable water bottles- behavior.

Perceived Behavioral Control (PBC)

Perceived behavioral control is defined as a person's belief as to how easy or difficult performance of the behavior is likely to be. Beliefs about resources and opportunities may be viewed as underlying perceived behavioral control. Thus, if a person believes that he/she possesses the required resources, knowledge, and skill and expects few impediments in reaching the goal, the person's perceived control over behavior should be high. Many researchers have addressed this construct in the past. Triandis (1977) referred to "facilitating factors," Kuhl (1985) called it "action control," and Sarver (1983) referred to it as "context of opportunity." Perceived behavioral control has been identified as a predictor of intention toward consuming environmentally friendly products, such as laundry detergent products (Mainieri et al., 1997) and eco-friendly hotels (Han, Hsu, & Sheu, 2010). Also, past research suggests that factors such as lack of drinking water alternatives and preference for convenient drinking water access (e.g., when engaging in out-of-home activities) can contribute to bottled water consumption (De França Doria, 2010). These contingencies are perceived to be not within the control of an individual. From the above, it is seen that when behavioral control is perceived to be low, intentions may not translate into behaviors.

H4: There is a positive relationship between PBC and young adults' intentions to use reusable water bottles.

H5: There is a positive relationship between PBC and young adults' use of reusable water bottles - behavior.

Research Outcome: Intentions and Behaviors toward Reusable Bottles

The outcome variables that have been identified in this research are intentions to purchase and use of reusable bottles as representing behavior.

The link between attitudes and behaviors has been conceptualized as being influenced by intentions, which is understood as being a close proxy. There is a large body of literature that includes the intention behavior link in the models developed to explain behavior. Overall, it is seen that intentions are most frequently used to predict behaviors and this relationship is rather stable. Yet other perspectives suggest that intention could easily change according to the context or even under the influence of the measurement process, thus in many instances they may not be predictors. Since the research results are not unequivocal, we would like to state the below hypothesis being open if this is not supported.

H6: There is a positive relationship between intentions toward not purchasing single use plastic water bottles and young adults' behavior. Behavior as reflected by use of reusable water bottles.

RESEARCH METHODOLOGY

Selection of Cohort Group

The survey was administered to a sample of business students at a university located in the United States southwest. Data for the survey were collected from 155 students in upper-level marketing classes. Participation in the survey was voluntary and confidentiality was assured. After being provided with some general verbal instructions at the beginning of the data collection session, the respondents were allowed to work at their own pace. This age cohort is appropriate to study sustainable consumption behaviors, since this phenomenon of using water bottles or reusable bottles is very common on college campuses. I was also interested in not only testing the theory of planned behavior, but also to understand student values, attitudes, perception of constraints as they had an impact on the intention and purchase of reusable water bottles.

Questionnaire Development

The questionnaire was constructed based on 1) a review of existing literature and scales; 2) a review of business press and newspaper coverage of the topics of plastic use and environmental problems, attitudes, values, and perception of constraints in purchasing reusable bottles; and 3) the theoretical definition of study constructs that have been well established in the literature. Whenever possible, previously established scales were utilized. The final questionnaire consisted of 51 items.

Measurement Issues and Pre-testing of Research Instruments

Psychometric Evaluation. Initial factor analysis using the principal components extraction method using varimax rotation was performed to establish the dimensionality of the scales. Item-scale selection was done using a cut-off score of 0.40 on factor loadings (Rummell, 1967). Once the initial dimensionality or the factor structure of the scales had been established, the standardized alpha coefficients were calculated. There are two standards by which alpha coefficients are evaluated. One is a reliability of 0.50 (Nunnally, 1967), and the other is a reliability of 0.70 (Nunnally, 1978). These two levels of alpha coefficient are used to distinguish between exploratory scales and established scales. Confirmatory factor analysis was performed on the scales by using LISREL8 (LISREL8 for Windows v8.14).

Table 1. Summary of Measurement Scale Properties

Construct	Reliability
Pro-environmental Values	.89
Attitudes toward Reusable Bottles	.63
Perceived Behavioral Control	.66
Intentions	.95
Behavior	.95

Measurement Characteristics

We used structural equation modeling (Jöreskog & Sörbom, 1983) to evaluate the hypothesized model. In path analysis, the measurement model can be ignored and the measurement error for items can be assumed to be without error (Kelloway, 1998), if the alpha reliabilities of all variables are in excess of .70 (Pedhazur, 1982). However, it is important to point out that there are two standards by which alpha coefficients are evaluated. One is a reliability of 0.50 (Nunnally, 1967), and the other is a reliability of 0.70 (Nunnally, 1978). The reason we use these two levels is to distinguish between exploratory scales and established scales. Nunnally (1978) makes this point when he states, "In the early stages of research on predictor tests or hypothesized measures of a construct, one saves time and energy by working with instruments that have only modest reliability, for which purpose reliabilities of 0.60 or 0.50 will

suffice” (p. 226). Since ours is essentially an exploratory study, we feel comfortable with the reliabilities we obtained. The Cronbach alphas in our case ranged from .70 to .92. All of these values were within acceptable range. The factor loading values were well above the .40 recommended by Rummell (1967). The fit statistics for the confirmatory factor analyses indicated a very good fit of the model to the data.

RESULTS

Item Analysis: We report means and standard deviations of sample responses for some questionnaire items we think are very revealing. As the below Table 2 shows, overall the young adults in our study have demonstrated concern for the environment. They agree that humans are abusing nature and we are on a catastrophic path to ecological damage. Regarding plastic pollution, respondents in our study had very strong views and strongly agreed with the statement that plastics are harmful to the environment and ocean life. The link between using disposable bottles and overflowing landfills was weak. The respondents also agreed with statements that reusable water bottles save money and are inconvenient over statements that water in disposable bottles tastes better. Despite the above positive values and attitudes, respondents in our sample did not use reusable water bottles (3.6 on a 7-point scale).

Table 2: Item Analysis - Means and Standard Deviations of Sample Responses

Item	Mean	SD
The balance of nature is very delicate and easily upset	5.35	1.5
Humans are severely abusing the environment	5.88	1.4
If things continue on their course, we will soon experience a major ecological catastrophe	5.60	1.6
Using a reusable water bottle saves me money	5.4	1.9
Using a reusable water bottle is convenient	5.3	1.9
Buying disposable bottled water (Dasani) is more convenient	4.9	1.8
Bottled water tastes better	4.9	1.7
I am helping with reducing trash in landfills by not buying and using plastic disposable water bottles.	4.1	2.0
Plastic pollution is harmful to the environment	6.3	1.1
Plastic pollution is harmful to fish and ocean life	6.4	1.1
The next time you go grocery shopping how likely are you to purchase disposable water bottles	5.0	1.9
I use a reusable water bottle	3.68	2.34

Analysis. Path analysis was used to test the causal model to the extent the observed variables were representative of the latent constructs of the proposed model. Our model had the following fit statistics. The χ^2 was .116 ($p=0.7332$). Non-significant chi-square value in path analysis shows the goodness of fit model. The other fit statistics are good. The normed fit index (NFI) and comparative fit index (CFI) were .978 and 1.0, respectively. The root mean square residual (RMR), the standardized SRMR, and root mean square error of approximation (RMSEA) were .0032, .0031, and 0.0 respectively. The goodness of fit index (GFI) and the adjusted goodness of fit index (AGFI) were 1.0 and .966, respectively. The fit statistics for the path model indicate a good fit to the data.

Results. It was hypothesized that environmental values or the new environmental paradigm, attitudes toward plastics, behavioral controls would impact intentions to purchase and actual behavior like use of a reusable bottle. Table 3 below shows the results of the path analysis. The results we got are very interesting. For example, environmental values have no influence on intentions. This is interesting because item analyses reveals that the respondents have positive values toward environmental protection, but this does not influence intentions. We suggest that this is typical; persons can have values (abstract), but this may not translate to concrete behavior and intentions are a precursor to

behavior. The second surprising result was the non-relationship between intentions and behavior. Consumer behavior models give an importance to intentions and suggest that these signals by consumers are good indicators of behavior. What we think is that, again in our sample, intentions are not that important and do not represent or act as proxies to behavior. What our research does show is that negative attitudes toward plastic use influence both intentions and behaviors as do perception of constraints in using reusable bottles. These relationships make sense intuitively and it is gratifying that they are tested and show that respondents in our sample, who have negative attitudes toward plastics, do have both intentions to buy and in fact use a reusable water bottle. In addition, if a consumer perceives a disposable bottle as convenient, or a reusable bottle as taking too much work and effort, they will not have the intention to buy or use a reusable bottle.

Our results showed that the theory of planned behavior is a useful model to use in understanding behaviors among the Hispanic sample. This theory highlights the role of constraints in impacting behavior and for respondents in our sample this certainly holds true. Also, influencing attitudes toward the danger of plastics and the benefits of not disposing plastics can help. Further, making use of reusable bottles as convenient and good for the environment will remove the overarching perception that disposable bottles are convenient. To attach a cost to this convenience will reduce the role of constraints in influencing behaviors. When disposable plastic bottles are shown for the total cost on the environment, then the work associated with a reusable bottle will be perceived as less onerous.

Table 3: Path Model Results - Standardized Path Coefficients among Latent Variables

Path	Variables	Hyp.	Std. Coeff.	p-value
γ_{11}	New Environmental Paradigm – Intention to purchase	H1	.068	.419
γ_{12}	Pro-environmental Attitudes – Intention to purchase	H2	.188	.027*
γ_{13}	Behavioral Control – Intention to purchase	H3	.290	.000**
β_{21}	Pro-environmental Attitudes - Behavior	H4	.855	.000**
β_{22}	Perceived Behavioral Control - Behavior	H5	.076	.050*
β_{22}	Intention to Purchase - Behavior	H6	.045	.897
Explained Variance				
$R^2\eta_1$	Intention to Purchase		.133**	
$R^2\eta_2$	Behavior		.735**	

(Path coefficients significant at p-value < .05)

Contributions of this Research

The insights from this research will help a number of publics. First, it will help public policy officials understand the relative importance of the role of positive attitudes toward sustainable behaviors like using reusable water bottles. It will indicate to social marketing experts that influencing attitudes through public service communication can go a long way in affecting intention and behavior toward plastic bottles. Next, our research will throw light on the role of pro-environmental values. Instilling values requires many socializing agents like family, schools, and media to work together to depict the planet as worthy of our care. Our research shows that much work needs to be done in communicating the link with one's values and one's behavior. Also, to address the problem of every consumer doing one's part in addressing this problem. Finally, this research will provide a test of the theory of planned action by including the impact of perceived behavioral control. Often buying and using a reusable water bottle is perceived as being 'too costly' and 'inconvenient'. We suggest that social marketing efforts must address these constraints that are dominant in the minds of consumers and make them less important by mainly focusing on issues like the total cost of a disposable bottle, not just 50 cents but much much more when including all the externalities. The above have been the chief contributions of our research.

Finally, product strategy that is in line with consumer preferences provides a competitive advantage to the firm. Our research has shown that in the design of new products, increasingly companies will need to focus on values toward the environment. This research has shown that, for many consumers, protection of the environment by way of reducing plastic use is an important consideration. For companies that use plastics in their packaging, this is important information and will influence product design, thus providing competitiveness.

REFERENCES

- Ajzen, I. (1991). The theory of planned behavior: Some resolved issues. *Organization Behavior and Human Decision Processes*, 50, 179-211.
- Bagozzi, R. P., & Dabholkar, P. A. (1994). Consumer recycling goals and their effect on decisions to recycle: A means-end chain analysis. *Psychology & Marketing*, 11(4), 313-340.
- Banerjee, B., & McKeage, K. (1994). How green is my value: Exploring the relationship between environmentalism and materialism. *ACR North American Advances*.
- Berger, I. E. (1997). The demographics of recycling and the structure of environmental behavior. *Environment and Behavior*, 29(4), 515-531.
- Biswas, A., Licata, J. W., McKee, D., Pullig, C., & Daughtridge, C. (2000). The recycling cycle: An empirical examination of consumer waste recycling and recycling shopping behaviors. *Journal of Public Policy & Marketing*, 19(1), 93-105.
- Dunlap, R. E., & Van Liere, K. D. (1978). The "new environmental paradigm." *The Journal of Environmental Education*, 9(4), 10-19.
- Engel, J., Blackwell, R., & Kollat, D. (1978), *Consumer behavior* (3rd. ed.) New York: Holt, Rinehart, and Winston.
- Eagly, A. H., & Chaiken, S. (1993). *The psychology of attitudes*. Harcourt Brace Jovanovich.
- Howenstine, E. (1993). Market segmentation for recycling. *Environment and Behavior*, 25(1), 86-102.
- Joreskog, K., & Sorbom, D. (1983). *LISREL 8: User's guide*. Chicago, IL: Scientific Software International.
- Kaiser, F. G., Ranney, M., Hartig, T., & Bowler, P. A. (1999). Ecological behavior, environmental attitude, and feelings of responsibility for the environment. *European Psychologist*, 4(2), 59.
- Kuhl, J. (1985). From cognition to behavior: Perspectives for future research on action control. In *Action control* (pp. 267-275). Berlin, Heidelberg:Springer.
- Norman, P., Conner, M., & Bell, R. (1999). The theory of planned behavior and smoking cessation. *Health Psychology*, 18(1), 89.
- Nunnally, J. C. (1978). *Psychometric theory* (2nd ed.)
- Pedhazur, E. J. (1982). *Multiple regression in behavioral research*. Fort Worth, Tex.: Harcourt Brace.
- Poortinga, W., Steg, L., & Vlek, C. (2004). Values, environmental concern, and environmental behavior: A study into household energy use. *Environment and Behavior*, 36(1), 70-93.
- Schor, J. (1988). Does work intensity respond to macroeconomic variables? Evidence from British manufacturing, 1970-1986 (No. 1379). Harvard Institute of Economic Research, Harvard University.

- Shrum, L. J., McCarty, J. A., & Lowrey, T. M. (1995). Buyer characteristics of the green consumer and their implications for advertising strategy. *Journal of Advertising*, 24(2), 71-82.
- Stern, P. C. (2000). New environmental theories: Toward a coherent theory of environmentally significant behavior. *Journal of Social Issues*, 56(3), 407-424.
- Taylor, S., & Todd, P. (1997). Understanding the determinants of consumer composting behavior 1. *Journal of Applied Social Psychology*, 27(7), 602-628.
- Triandis, H. C. (1977). *Interpersonal behavior*. Monterey: Brooks.
- Trigg, A. B. (2001). Veblen, Bourdieu, and conspicuous consumption. *Journal of Economic Issues*, 35(1), 99-115.
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