Environmentally Friendly Products: Factors Affecting Search for Information



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Current research covers various forms of environmentally concerned consumer behavior, and their determinants. However, there is little research focus on the factors affecting search for information relating to environmentally friendly goods and services. An investigation was conducted into the role of perceived consumer effectiveness and income on search for information, through a national survey (n=213). Results support the hypothesis that 19 percent of the variation in search for information is accounted for by perceived consumer effectiveness, while six per cent is accounted for by income. The study theorizes the role of perceived consumer effectiveness, and offers research and other implications.

Keywords: Environmental Marketing, Consumer Behavior, Search for Information, Perceived Consumer Effectiveness, Green Marketing, Environmental Policy

1. Introduction

Consumer concern for the earth's physical and natural environment has grown rapidly since the 1990's (Egri and Herman [12], Keesling and Kaynama [18]). The understanding of environmentally concerned consumer behavior is of importance to consumers, business, marketing, educationists, public policy makers, thinkers and academicians (Egri and Herman [12], Joonas [16], Joonas, Ruiz, and Tandon [17], Keesling and Kaynama [18]). Research has been conducted on environmentally concerned consumers' search for information on pro-environmental goods and services (Ling-yee [20], Minton and Rose [21]). In addition, literature describes perceived consumer effectiveness as a determinant of environmentally concerned consumer behavior (Anderson, Henion, and Cox [4], Antil [5], Balderjahn [6], Henion [14], Kinnear, Taylor, and Ahmed [19], Roberts, [23], Rotter [27], Webster [29]). However, the role of perceived consumer effectiveness as an antecedent of search for information on environmentally friendly goods and services has not been examined in the literature. The first purpose of this study is to investigate the impact of perceived consumer effectiveness as an antecedent of search for information on environmentally friendly goods and services. Furthermore, the role of income in producing environmentally concerned consumer behavior has been examined in the literature, with equivocal results (Antil [5], Balderjahn [6], Ling-yee [20], Webster

[29]). Therefore, the second purpose of this study is to shed light on the direct effects of income on the formation of search for information.

The significance of this study lies in the fact that, in relation to environmentally conscious consumer behavior, search for information on environmentally friendly products comprises an important behavioral outcome (Ling-yee [20], Minton and Rose [21]). An empirical investigation of the direct linkage between antecedents of search for information, such as perceived consumer effectiveness, and income, would address the lacunae in this area.

2. Literature Review

The Search for Information Construct

The information processing theory (Bettman [7]) contains assumptions about how consumers respond to information provided by various sources, and then use the information in specific choice situations. "The basic elements of the theory are the concepts of processing capacity: motivation, attention and perception, information acquisition and evaluation, decision rules and processes, and consumption and learning. In addition, mechanisms for continually examining the environment (a scanner), and interrupting current behavior, if necessary, and means for handling conflict are needed … the operation of the theory is influenced by three other factors: individual differences, situational influences, and effects of different types of stimuli" (Bettman [7]).

Further, the search for information may be internal (retrieval from memory), or external (from Consumer Reports, retailers, friends and acquaintances). Again, the search for information may be active (when a person has a specific goal in mind, e.g. a purchase goal), or passive (e.g. when a person has no purchase goal in mind). Information is in many cases actively evaluated by customers. The particular information found may lead to interrupts or changes of goals.

In relation to environmentally conscious consumer behavior, search for information on environmentally friendly products comprises an important behavioral outcome (Ling-yee [20], Minton and Rose [21]). This includes, for instance, the frequency of comparing package label information, noticing and paying attention to advertisements, and talking to family, friends and co-workers about environmentally friendly products and activities. In this study, the term search for information is used per the definition of Minton and Rose [21].

Perceived Consumer Effectiveness and Its Main Effects

Perceived consumer effectiveness is defined as a measure of the subject's judgment in the ability of individual consumers to affect environmental resource problems (Antil [5]), and is similar to the concept of internal locus of control (Rotter [24], [25]). The environmentally conscious consumer is convinced that he can actually change the status quo of continued environmental deterioration (Henion [14]). Socially conscious consumers are convinced that they can do something about pollution (Webster [29]). In this study, I use Antil's [5] definition of perceived consumer effectiveness.

The concept of internal-external locus of control is rooted in social learning theory (Rotter [24], [25]). A distinction is made between internal versus external control of

reinforcement. Individuals with an external locus of control comprehend reinforcements resulting from behavior as a direct result of luck, chance, or fate. On the other hand, individuals with a faith in internal control understand the same reinforcements to be the linked with their own ability or actions (Rotter [25]). The earlier interpretation of locus of control related to learning processes was that the probability of behavioral change, following positive or negative behavioral reinforcement, is higher for individuals with a belief in internal control, as compared with individuals with a belief in external locus of control. Behavioral change is contingent upon the value of the reinforcement. For instance, individuals with an internal locus of control attach greater relevance to perceived reinforcements of value, since they believe that they have control over reinforcements; accordingly, they change their behavior. However, individuals with an external locus of control believe that all outcomes depend on luck, chance, powerful others, or destiny; consequently, they are less likely to change their behavior, for in their perception, a change in behavior would have no effect on their reinforcements (Rotter [25]).

Locus of control helped explain the linkage between certain cognitions and behavioral change; however, it is incorrect to assume that qualities of individuals with internal locus of control are all positive, and vice versa (Rotter [26]). The concept of locus of control was the key to the transition in research from trait-based to behavior-based research. In current literature, the heightened attention to locus of control lies in its utility in comprehending the way social problems are conceptualized in Western culture, and the resulting sense of powerlessness. This utility accounts for the proliferation of locus of control in several fields, including mental health (Rotter [27]).

A related concept is "intensity hypothesis" (Anderson, Henion, and Cox [4]), which these researchers had theorized and empirically tested. These researchers made a distinction between the "traditional" socially concerned consumer, and the environmentally concerned consumer. They hypothesized that the environmentally concerned consumer would possess certain demographic characteristics, and more so, psychological characteristics to a significantly greater degree than the (traditional) socially concerned consumer. This expectation, which was referred to as the "intensity" hypothesis was conceptually justified on the basis that the environmentally concerned consumer would be much more vehement about his desire to right the environmentally related wrongs of society (Henion [14]). Support was found for the intensity hypothesis on basis of the exceptions with respect to two of the psychographic characteristics, alienation and personal competency, that were especially revealing. Contrary to expectations, the environmentally concerned consumer was shown to be more alienated, and more competent, than the (traditional) socially conscious consumer.

The term "perceived consumer effectiveness" was first described Kinnear, Taylor, and Ahmed [19] as the conviction of the environmentally concerned consumer, that he can actually change the status quo of continued environmental deterioration. A mail survey was conducted among 500 members of Canadian Family Opinion, University of Western Ontario Consumer Panel. Environmental concern was the dependent variable (comprising attitude and purchase behavior), and the direct effects of ten predictors (comprising socio-economic and personality variables, one of them being perceived consumer effectiveness) were observed. Results from

multiple cluster analysis, a dummy variable regression procedure evidenced that consumers show more concern for the environment when they perceive that individuals can be effective in stemming pollution. Perceived consumer effectiveness was found to be the best among 10 predictors of ecological concern, with an MCA regression coefficient ranging from -2.49 for "low perceived consumer effectiveness" to 2.54 for "high perceived consumer effectiveness", with model mean= 11.31, and R^2= .28 (Kinnear, Taylor, and Ahmed [19]).

On the basis of a mail survey of 432 customers of a refuse collection agency in New England, Webster [29] describes environmentally concerned consumers as more accepting of the views of others (high tolerance scores), and willing to exercise initiative (dominance) on a conviction that their own actions can make a difference (perceived consumer effectiveness).

Based on the above findings, some researchers (Henion and Wilson [15]) examined whether the environmentally concerned consumer could be described in terms of locus of control. The results of the study lend support to the locus of control hypothesis. A correlation was undertaken, between the locus of control scale, and two separate measures of environmental concern. As expected, the scale and the index varied directly with internal-type, and inversely with two external-type measures of locus of control, viz. "chance" and "powerful others". So did the important attitude of perceived consumer effectiveness (Henion and Wilson [15]).

The construct perceived consumer effectiveness also finds support in the theory of planned behavior, which provides a conceptual framework to address the problem of incomplete volitional control (Ajzen [1], [2]). An extension of the theory of reasoned action, it accounts for the factor of volitional behavioral control. This factor refers to the perceived ease or difficulty of performing the behavior, and reflects past experience as well as expected impediments. The antecedents of perceptions of behavioral control are control beliefs of the person. These control beliefs may be based on past experience with the behavior, but may also be influenced by second-hand information about the behavior, and by observing the experiences of their acquaintances and friends. The more resources and opportunities individuals think they possess, and the fewer impediments they anticipate, the greater should be their perception of control over behavior (Ajzen [1], [2]). This reflects the locus of control construct (Rotter [24], [25], [26], [27]); however, in one conceptualization (Ajzen [1], [2]) the perception of control rests on information, which the individual accumulates either at first hand, or through personal or other sources.

The above results were further supported by subsequent empirical findings. For instance, Balderjahn [6] conducted a survey among 791 adults in the Federal Republic of Germany in 1980, and evaluated the direct effects of four determinants (i.e. demographic characteristics, socio-economic characteristics, personality, and attitude) on five dimensions of consumption (i.e., energy conservation, home insulation, energy curtailment, type of products purchased, support for an environmental organization, and the use of automobiles). Results from a multiple indicator measurement (LISREL) model revealed that, on the basis of path coefficients, that the attitude of perceived consumer effectiveness is an important determinant of environmentally concerned consumer behavior. Perceived consumer effectiveness has significant direct linkages with two dimensions of consumption, i.e., energy saving (path coefficient .24) and purchase of non-polluting products

(path coefficient .25). The model had a goodness of fit index of .866 (Balderjahn [6]).

The most striking results in support of perceived consumer effectiveness were obtained in a subsequent study (Roberts [23]). With the objective of segmenting environmentally concerned consumers in the U.S., a study was conducted on a random sample of 582 adults from six test-marketing regions. The dependent variable, environmentally concerned consumer behavior, was regressed on five demographic variables, viz. environmental concern, perceived consumer effectiveness, and liberalism. In a hierarchical model of multiple regression, it was observed that demographic variables explained only six per cent of the variance (R^2 = .06, F= 7.29, p≤ .0001, df= 5.531). However, in the full model, which included attitudinal and demographic variables, R^2 increased to 45 per cent (F= 52.52, p≤ .0001, df= 8.519). Perceived consumer effectiveness accounted for 33 per cent of the variation in behavior, compared to only five per cent for environmental concern, and two per cent for liberalism.

As noted earlier, literature has not probed the potential direct linkage between perceived consumer effectiveness and search for information. I will proceed to specify this direct linkage, which I will also empirically examine.

Some empirical studies evidence that consumers' difficulty in locating environmentally directed products is rooted partly in lack of information (Brown and Wahlers [8]). Further, environmentally concerned consumers, on the contrary, feel serious about the environment, are aware and informed, and take responsibility for preserving the environment. Environmentally concerned consumers are characterized by strong perceived consumer effectiveness, the conviction that they can actually change the status quo of continued environmental deterioration (Anderson, Henion, and Cox [4], Balderjahn [6], Henion [14], Henion and Wilson [15], Kinnear, Taylor, and Ahmed [19], Roberts [23], Webster [29]).

On the basis of the preceding theoretical and empirical support, I posit that:

H_1: Perceived consumer effectiveness will be significantly and positively related to search for information.

Income and Its Main Effects

Literature on environmentally concerned consumer behavior is equivocal on the effects of income. Various studies report the relationship to be nil (Antil [5]), negative (Roberts [23]) or positive (Balderjahn [6], Ling-yee [20]). The latter findings were supported in a study (Ling-yee [20]) which reports a moderating effect of income, on the direct relationship between collectivism and environmentally concerned beliefs and attitudes, on environmentally concerned purchase behavior.

Based on the preceding, I treat income as a control variable, and posit that:

H_2: Income will be significantly and positively related to search for information.

Below is described the methodology adopted for the present study.

3. Methodology

A national random survey was conducted on the web site of a school accredited by the Association to Advance Collegiate Schools of Business International (AACSB).

Respondents were members of environmental organizations in the U.S.A., who accessed the survey through a link on a Department of Natural Resources web site. Some of the Department activities included communication about environmental issues, organizing field trips on nature trails, and advocacy with business and government. Being highly concerned about environmental issues, and knowledgeable about the terms and concepts used in that context, such individuals might be suited to the purpose of the study; viz. to understand the behavior of environmentally concerned consumers. Data collection was completed by the winter of 2004. The survey was voluntary, anonymous, and structured. A cover letter described the objectives of the study and assured confidentiality.

Measures

The dependent variable, search for information (six items), is a scale from Minton and Rose [21], a 7-point Likert–type scale with 1= "almost never" and 7= "very frequently". Minton and Rose [21] reported an alpha of .90. Perceived consumer effectiveness (4 items) is taken from Roberts [23], rated on a 7-point Likert-type scale, anchored by 1= "strongly disagree" and 7= "strongly agree". Roberts [23] reported an alpha of .72. The control variable annual income in dollars was treated as a categorical predictor, and was dummy coded as 0= "9,999 or less", 1= "10,000-14,999", 2= "5,000-19,999", 3= "20,000-29,999", 4= "30,000-49,999", 5= "50,999-99,999", and 6= "100, 000 and over".

4. Statistical Analysis And Testing Of Hypotheses

Data were collated and analyzed with the use of SPSS software. Reverse coded items were recoded. Missing values were substituted by "trend at a point". Diagnostic tests were undertaken; extreme values were ascertained to be $\leq$.05 percent of observations; normality was confirmed; and no pattern was observed in the distribution of error terms. In addition, psychometric assessment of measurement scales was also undertaken: scale dimensionality through factor analysis using Principal Component Analysis, and scale reliability through item-total correlations and Cronbach's α. Hierarchical regression analysis and analysis of variance were conducted to examine the direct linkage between income, and perceived consumer effectiveness, on search for information. In $Model_1$, the dependent variable, summated, averaged score of on six items on the search for information scale (SCHINFO), was first regressed against the control variable income (HHY). In $Model_2$, the summated averaged score of the six items on the search for information scale (SCHINFO) was regressed against the control variable income (HHY), and the independent variable, the summated average score of perceived consumer effectiveness (PCEFFE). The best-fit model was assessed through comparing R^2, change in R^2, change in Regression F with the level of significance, and Model F, along with the level of significance.

The members of various environmental organizations formed the sampling frame for this study. A total of 231 surveys were received. However, 18 of them were incomplete. It was decided to utilize the 212 completed surveys for analysis. There was no indication of nonreponse bias.

The sample was about 31 percent male, with a median age of 35-44 years, and with a median income of $50,000- 99,999 per year. Of the sample, 3.7 percent had some

schooling, 6.6 per cent had some college experience, 31.6 percent held a college degree, 37.2 percent held a master's degree, and 21.2 per cent held a doctoral degree. In addition, 68.1 percent were in a technical or professional occupation, 8.6 percent worked in a managerial capacity, 7.1 percent held a clerical or sales position, 10.3 per cent were students, and 2.8 per cent were homemakers.

Discriminant validity was assessed through a correlation analysis. This ruled out a high correlation ($\geq .4$) among the study variables that, based on theory, should not be highly correlated. One significant correlation was greater than 0.40, perceived consumer effectiveness<-->search for information, and this was expected to be strongly correlated.

Data were confirmed to be adequate for factor analysis of the scales. The search for information scale showed KMO Measure= .813, Bartlett's test of sphericity= approx. χ^2= 796.919, df= 15, p=.000. Furthermore, the perceived consumer effectiveness scale had KMO Measure= .941, Bartlett's test of sphericity= approx. χ^2= 4326.871, df= 120, p=.000. With initial communalities ≥ 1, and item loadings $\geq .4$, factor analyses confirmed the unidimensionality of each construct (Hair, Anderson, and Tatham [13]).

Scale reliability was assessed by using the alpha method (Nunally [22]). For search for information n=6, Hoteling's T= 469.265, F= 92.082, df_1=5, df_2=208, p=.000, and Cronbach's α=.880 (.95 reported by Minton and Rose [21]). For perceived consumer effectiveness, n= 4, Hoteling's T was 226.857, F= 74.906**,** df_1=3, df_2=210, p=.000, and Cronbach's α= .506 (.76 reported in an earlier study (Ling-yee [20]). In view of this analysis, and to retain the original psychometric properties of the scale, all items were retained on each scale. Reliability estimates (Anderson and Gerbing [3]) are given in Table 1.

Table 1 *Reliability Estimates*

	Search for Information Scale Items	**Component 1**[a]
1.	How often do you compare package label information about the environmental safety of the product and/or package while you are in a grocery store?	.863
2.	How often do you notice advertisements about environmentally friendly products?	.854
3.	How often do you actually pay attention to advertisements about products which are safe for the environment?	.830
4.	How often do you talk to your neighbors about various environmentally friendly products or activities?	.752
5.	How often do you talk to your close personal friends about environmentally friendly products or activities?	.749
6.	How often do you talk to your family members about environmentally friendly products or activities?	.701

Scale alpha (N= 213, Scale n= 6, F= 92.082, p= .000) = .880

	Perceived Consumer Effectiveness Scale Items	Component 1[a]
1.	It is worthless for the individual to do anything about the environment.*	.527
2.	When I buy products, I try to consider how my use of them will affect the environment and other consumers.	.745
3.	Since one person cannot have any effect upon pollution and natural resource problems, it doesn't make any difference what I do.*	.784
4.	Each consumer's behavior cannot have a positive effect on society by purchasing products sold by socially responsible companies.*	.546

Scale Alpha (N= 213, Scale n= 4, F= 74.906, p= .000) = .506

** Reverse-coded.*
Extraction Method: Principle Component Analysis.
a. One component extracted. The solution cannot be rotated.

The selected scale items for the study variables were summated and averaged. Search for information was found to be normally distributed, with mean= 4.42, and standard deviation=1.21. Similarly, perceived consumer effectiveness was found to be normally distributed, with mean= 5.86, and standard deviation=0.88.

Hierarchical regression analysis (Cohen and Cohen [10], [11]) was conducted, as it helps isolates the unique contribution of study variables. In $Model_1$, the control variable income was entered as a predictor of search for information, while in $Model_2$, perceived consumer effectiveness was added as the predictor. Parameter estimates for the best model fit are presented in Table 2 ($Model_2$, R^2= .250, R^2_{change}= .196, F_{change}= 35.032, p<.000, df_1=1, df_2=210, F_{model2}= 54.868, p<.001). According to $Model_2$, at the .001 level of significance, about 14.6 percent of the variation in search for information was accounted for by income, and about 61.7 per cent of the variation in search for information was explained by perceived consumer effectiveness. The regression equation for this model was:

SCHINFO= .146 HHY + .617 PCEFFE

Where:

SCHINFO= summated average score of six search for information scale items

HHY= income

PCEFFE= summated average score of six perceived consumer effectiveness items.

5. Research Findings

Hypothesis H_1 suggested that perceived consumer effectiveness would be significantly and positively related to search for information. Regression results provided support for Hypothesis H_1. Perceived consumer effectiveness (b= .617, t= 7.407, p= .000) was evidenced to be significantly and positively related to search for information. Thus, a unit increase in perceived consumer effectiveness would result in a .167 units increase in search for information at the .001 level of significance. It may be noted that the direct linkage between perceived consumer effectiveness and

Table 2 *Results of Hierarchical Regression Analysis Predicting Search for Information*

Parameters	$Model_1$		$Model_2$	
	b	*t*-value	*b*	*t*-value
Constant	3.594	14.353***	n.s.	
Control Variable				
Income	.200	3.479***	.146	2.821**
Hypothesized Predictor				
Perceived Consumer Effectiveness	--		.617	7.407***
Model fit				
R^2	.050		.054	
R^2_{Change}	.250		.196	
F_{Model}	12.106***		54.868***	
F_{Change}	12.106***		35.032***	

*** *Significance < .001*

** *significance < .01*

N.s. not significant

search for information has not been examined earlier in the literature, and comprises a research contribution of this study.

Furthermore, Hypothesis H_2 posited that income would be significantly and positively related to search for information. Regression results indicate that income (b= .146, t= 2.821, p< .005) is significantly and positively related to search for information. In other words, at the .005 level of significance, a unit increase in income level would result in a .167 units increase in search for information.

6. Discussions and Conclusions

Hypothesis H_1 suggested that perceived consumer effectiveness would be significantly and positively related to search for information. Empirical results supported this hypothesis. Results are in line with extant literature (Anderson, Henion, and Cox [4], Balderjahn [6], Henion [14], Henion and Wilson [15], Kinnear, Taylor, and Ahmed [19], Roberts [23], Rotter [25], [26], [27], Webster [29]). This finding has implications for business and marketing, environmental groups, as well as public policy makers and local agencies.

The “well-baby” approach would be an effective tool, reinforcing the perception that individual efforts can, and do, impact the environment. Environmental compliance would be better achieved through the portrayal of a positive and achievable vision of the environment (Roberts [23]) as opposed to doomsday predictions (Carson [9]). The protection-motivation model might be relevant in this context (Tanner, Hunt, and Eppright [28]). Additionally, the role of educational institutions, particularly business schools, needs to be highlighted in relationto perceived consumer effectiveness. For instance, AACSB standards require business schools to incorporate environmental consciousness through the curriculum (Joonas,

Ruiz, and Tandon [17]). The focus of environmental education should be on strengthening the perceived consumer effectiveness of potential business executives and citizens. A similar strategy needs to be adopted by government and environmental groups, in their public communications. Such measures will encourage search for information on environmentally-friendly products. Finally, consumer groups need to intensify efforts to strengthen the perceived consumer effectiveness among consumers in general, so as to increase the search for information on environmentally friendly goods.

Furthermore, Hypothesis H_2 suggested that income would be significantly and positively related to search for information. Empirical results supported this hypothesis. Results are in conformity with extant literature (Ling-yee [20]). This would imply that in the short run, business and marketing should target their offerings at higher income group. Also, there is a need to undertake a concerted awareness campaign for environmentally friendly products among the middle income group. In the long run, however, attempts should be made to grow the market, and reap economies of scale, to make environmentally friendly products desirable and accessible across more income groups.

This study does not take into account numerous other factors that go into the making of search for information. Among demographic factors, only income has been considered as a control variable. In addition, the study is constrained by virtue of being cross-sectional in nature. A longitudinal study would shed light on the potential mutuality of cause and effect among the variables of interest. Furthermore, the study relies on scales that were developed during the nascent stages of the environmental movement, and may need closer examination.

In conclusion, it may be mentioned that the direct linkage between perceived consumer effectiveness and search for information has wide-ranging implications for the various environmental stakeholders, namely consumers, business and marketing, educational institutions, government, and environmental organizations, in their quest to preserve and protect the earth's physical and natural environment.

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