"Consumers' purchasing behavior towards green products in New Zealand"

AUTHORS	Christopher Gan (iD) https://orcid.org/0000-0002-5618-1651
	Han Yen Wee
	Luzie Ozanne
	Tzu-Hui Kao

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Christopher Gan (New Zealand), Han Yen Wee (New Zealand), Lucie Ozanne (New Zealand), Tzu-Hui Kao (Taiwan)

Consumers' purchasing behavior towards green products in New Zealand

Abstract

According to Hallin (1995) and McCarty and Shrum (2001), people engage in environmental behavior as a result of their desire to solve environmental problem, to become role models and a belief that they can help to preserve the environment. However, consumers' indications of positive attitude towards environmental issues do not necessarily lead to actual environmentally friendly purchasing behavior (Laroche et al., 2002). Majority of consumers do not purchase products based on the environmental concern alone and they will not trade-off other product attributes for a better environment (Yam-Tang and Chan, 1998).

New Zealand has always been perceived as a "clean and green" country. It is assumed that environmental consciousness among New Zealanders is high. However, there is little empirical evidence to suggest that the environmental values and attitudes are congruent with the consuming public's actions towards green products. In addition, most studies have focused on the general environmental behavior instead of specifically on consumers' purchasing behavior towards green products. Therefore, gaps exist in the literature with regards to understanding consumers' purchasing behavior towards green products. This research empirically examines the factors impacting consumers' purchasing behavior toward green products in New Zealand. The research also identifies factors that discriminate between those who purchase green products and those who don't.

Keywords: consumer behavior, green marketing, environmentally friendly products, logistic regression.

Introduction

Businesses and consumers today confront one of the biggest challenges – to protect and preserve the earth's resources and the environment. They have become more concerned with the natural environment and are realizing that their production and consumption purchasing behavior will have direct impact on the environment (Laroche, Bergeron, and Barbaro-Forleo, 2001). This awareness is congruent with the belief that the world's supply of natural resources is finite and the ecological balance of the environment may be at a critical disruption stage (Hayes, 1990). In addition, the great majority of our environmental problems – excess garbage, pollution, waste of energy and material, etc. are the result of consumers' consumptive behaviors.

The preferred mechanism for preserving the global and local environment is internalizing producers and consumer's practices and activities that have a negative effect on the environment. This mechanism takes the form of environmental standards such as the polluter pays principle, environmental taxes and penalties, and ecolabelling on products (also called environmental friendly products). Ecolabelling (also known as green labelling) has grown and spread over a number of countries (e.g., Germany, Singapore, India, United States, and Japan) and could be an effective tool in mitigating environmental problems. At present, however, the role of ecolabelled products has been viewed as modest and is seen simply as a part of a broader environmental agenda in most government regimes. With a better understanding of consumers' attitudes and behaviors, it will help correct the problem currently facing the environment and create markets for green products and services (Roberts, 1996).

According to Hallin (1995) and McCarty and Shrum (2001), people engage in environmental behavior as a result of their desire to solve environmental problem, to become role models and a belief that they can help to preserve the environment. However, the consumers' indications of positive attitude towards environmental issues do not necessarily lead to actual environmentally friendly purchasing behavior (Laroche et al., 2002). Majority of consumers do not purchase products based on the environmental concern alone and they will not trade-off other product attributes for a better environment (Yam-Tang and Chan, 1998).

New Zealand has always been perceived as a "clean and green" country. It is assumed that environmental consciousness among New Zealanders is high. However, there is little empirical evidence to suggest that the environmental values and attitudes are congruent with the consuming public's actions toward green products. In addition, most studies have focused on the general environmental behavior instead of specifically on consumers' purchasing behavior towards green products. Therefore, gaps exist in the literature with regards to understanding consumers' purchasing behavior towards green products. This research empirically examines the factors impacting consumers' purchasing behavior towards green products in New Zealand. The

research also identifies factors that discriminate between those who purchase green products and those who don't.

The remainder of this paper is organized as follows. Section 2 reviews previous studies on environmentally conscious consumer behavior and factors affecting their purchasing behaviors towards green products. Section 3 describes the data collection and the methodology employed. The results and their implications are discussed in section 4. Section 5 provides the conclusions.

1. The environmentally conscious consumer

The environment has become a critical issue that is influencing how products are developed, marketed, and disposed of. Previous research has shown that 84% of consumers expressed concern on issues related to the environment and some consumers are changing their consumptive and purchasing behaviors because of their concern (Schlossberg, 1990; Fisher, 1990). Such concern is also reflected in New Zealand where 41% of New Zealanders thought ozone depletion and greenhouse gases were the most important environmental issues at large, while 49% thought this was a major concern for New Zealand (Hamilton, 1990).

Morgan Polls (2006) showed that majority of consumers are environmental conscious about the environment. Previous studies also suggest that consumers who are willing to purchase green products are, in general, conscious about the environmental problem, concerned about the environment and believe that it is important to be environmentally friendly (Laroche et al., 2001; Schwepker and Cornwell, 1991). Furthermore, Antil (1984) discovered a positive relationship between environmental knowledge and pro-environmental attitudes. In other words, socially responsible consumers have more knowledge about environmental related issues and are likely to demonstrate positive attitudes toward the environment.

Previous studies found that people engage in environmental behavior as a result of their desire to solve environmental problem, to become role models (Hallin, 1995), and a belief that they can help to preserve the environment (McCarty and Shrum, 2001). Although these studies provide some insights into what motivates consumers to engage in green behaviors, it could not confirm that these motivations actually lead to consumers' green behaviors (e.g., recycling behavior) and in particular to green product purchasing behavior. Furthermore, most of these studies depend on self-reported data. These concerns raise questions regarding consumers' actual green behaviors, since consumers may only

claim to be green as a result of social acceptance and peers pressure (Kalafatis et al., 1999).

Research indicates that environmental concern is related but not necessary correlated with consumption behavior. Balderjahn (1988) found that an individual's attitude towards environmental problems has a positive effect on one's attitude towards environmentally conscious living. This suggests that individuals who are genuinely concerned about environmental problems are likely to take measures to prevent further environmental deterioration. Additionally, Balderjahn found that those having a positive attitude toward the environment tend to purchase environmentally friendly products. The research by Crosby et al. (1981) also demonstrates such a positive relationship.

Consumers in general will purchase products and services with a mix of attributes including environmental attributes that maximizes their utility. However, not all consumers are willing to pay a higher price for green products. This implies that consumers derive greater utility from the price and quality attributes rather than environmental attributes alone. The consumers may be willing to purchase the environmentally friendly products within certain constraints. However, huge price differentials and inconveniences associated with environmentally friendly products may deter consumers in buying them.

1.1. Factors affecting consumers' purchasing behaviors towards green products. A review of the literature shows that little attention has been paid to the issue of product attributes and green purchasing behavior. The product attributes play a very important role in product development since they affect consumer product choices and they help marketers to satisfy customers' needs, wants and demands. For example, Roozen and De Pelsmacker (1998) investigate the relative importance of different green product attributes to consumers. Their study is useful in understanding how consumers determine what product is a green product. However, the authors only focus on green attributes and ignore other product attributes that may affect consumer purchase decision.

Wessells et al. (1999) suggest that environmental attributes of a product are more difficult for a consumer to assess compared to other easily observable product attributes. A report by the Massachusetts Department of Environmental Protection (2002) also suggests that the difficulty in identifying and locating green products is one of the barriers to green product purchases. One way to overcome this issue is to utilize eco-labelling (or green labelling) programs to provide the customers with information

while at the same time addressing environmental issues. An eco-label is a voluntary claim that a product has fewer impacts on the environment with either production or consumption of that product (Blend and van Ravenswaay, 1999).

Previous studies suggest that consumers would purchase and are willing to pay more for green labelled products (see Bigsby and Ozanne, 2002; Vlosky et al., 1999; Ottman, 1992). However, green labelled products also contain potential dangers and drawbacks, especially when producers over-claim ecological responsibility or performance (Cary, Bhaskaran, and Polonsky, 2004). Some authors further suggest that consumers considered the information given on product labels inaccurate and confusing, thus they do not rely on these labels to make purchase decisions toward green products (D'Souza et al., 2006; Glegg, Richards, Heard, and Dawson, 2005).

Johri and Sahasakmontri (1998) showed that consumers do not base their purchasing decision on environmental concern alone. Product attributes such as convenience, availability, price, and quality play a more important role in the consumers' purchasing decision process. Anderson and Hansen (2004) also found that price was the most important attribute in American consumers purchase decisions for wood furniture. Their study also found that typical respondent is willing to sacrifice environmental certification for the sake of a lower price.

Although consumers are in general concerned about the environment, the previous literature found that consumers are extremely price sensitive towards green products (Massachusetts Department of Environmental Protection, 2002) and are unwilling to pay higher prices for green products (Ottman, 2000). Morgan Polls (2006) also found that a majority of consumers, including New Zealanders, perceived green products to be overpriced. D'Souza et al. (2006) further suggest that purchase probability for green product decreases as the price premium increases. Miller (1990) discovered that consumers are willing to pay up to 5% extra for a product under the environmentally friendly category (see Blamey, Bennett and Louivere, 1999). Thomas (1989) showed half of those interviewed would be willing to pay at least 10% more for ozone-friendly aerosols and recyclable products. Ozanne and Vlosky (1997) found that that consumers' willingness to incur a price premium for ecolabelled forest products varied depending on the value of the item considered, with a range from 4.4 to 18.7 percent.

According to Massachusetts Department of Environmental Protection (2002), consumers may per-

ceive green products as inferior in quality since some green products are manufactured with used or recycled materials, while others, such as green detergents, provide a lower level of technical performance compared to the conventional brands. Assael (1987) discovered that brand conscious consumers tend to purchase branded products based on loyalty, quality, and satisfactory performance of the products. Thus, this group of consumers may be reluctant to try non-branded and new products such as green products. Ng, Png, and Tan (1993) found some consumers would purchase green products if the prices were cheaper or comparable to normal products. Similarly, Simmons (1995) argued that environmentally conscious consumers might be willing to reduce their overall consumption levels to some degree but is highly price and convenience conscious.

Previous studies have also used demographic, socio-economic, cultural, personality variables and a host of psycho/socio factors such as alienation and attitudes, to identify the environmentally conscious consumer (Balderjahn, 1988; Antil, 1984). While the results are ambiguous, the environmentally conscious consumer tends to be better educated, higher income, and higher socio-economic status, and politically liberal people who are concerned about the environment (Balderjahn, 1988).

2. Methodology, theoretical model and data

Models for determining discrete choices such as whether to switch bank or not to switch bank, or to buy or not to buy green products fall into the realm of qualitative response models. Qualitative response models determine the probability (or likelihood) that a decision-maker, with a given set of attributes, makes one choice rather than the alternative (Liao, 1994). Economic agents are often observed making choices between activities rather than making choices involving levels of participation in markets. As a result, qualitative choice models have been used in analyzing participation in a variety of activities.

Utility from choices can be defined as the average utility from each choice plus a random error:

$$U_{i0} = U_{i0}\text{ave} + \varepsilon_{i0} = z'_{i0}\delta + w'_i\gamma_0 + \varepsilon_{i0} = \textit{utility from choice } 0, \tag{1}$$

$$U_{i1} = U_{i1}\text{ave} + \varepsilon_{i1} = z'_{i1}\delta + w'_i\gamma_1 + \varepsilon_{i1} = \textit{utility from choice } 1, \tag{2}$$

where U_{i0} and U_{i1} are the utilities from the two choices, U_{i0}ave and U_{i1}ave are the average utilities, z'_{i0} and z'_{i1} are vectors of attributes of the two choices as perceived by the ith consumer, w'_i is a

vector of the characteristics of the ith consumer, and ε_{i0} and ε_{i1} are random errors (Judge et al., 1993).

A consumer chooses to purchase green product if $U_{i1} > U_{i0}$. The observable choice of the purchase is denoted by $Y_i = 1$ and the observable choice of not purchasing green product is denoted by $Y_i = 0$. An unobservable choice variable, Y^*_i is given by $Y^*_i = U_{i1} - U_{i0}$. If $Y^*_i > 0$ then purchasing green product is chosen.

Y^*_i can be rewritten as:

$$Y^*_i = (z_{i1} - z_{i0})'\delta + w'_i(\gamma_1 - \gamma_0) + (\varepsilon_{i1} - \varepsilon_{i0}) = [(z_{i1} - z_{i0})', w'_i][\delta, (\gamma_1 - \gamma_0)]' + \varepsilon^*_i = x'_i\beta + \varepsilon^*_i. \qquad (3)$$

The explanatory variables (consumer characteristics and product attributes) are represented by x'_i, β is the vector of parameters associated with the variables, and ε^*_i is the error for the model for Y^*_i. The probability that the ith consumer $[Y_i]$ chooses alternative 1 is equal to one is:

$$Pr = Pr\,[Y_i = 1] = Pr\,[Y^*_i > 0] = Pr\,[\varepsilon^*_i - x'_i\beta]. \qquad (4)$$

If the random term (ε_i) is assumed to have a logistic distribution, then equation (3) represents the standard binary logit model. However, if we assume that the random term is normally distributed, then the model becomes the binary probit model (Maddala, 1993; Ben-Akiva and Lerman, 1985). The logit model will be used in this analysis because of convenience as the differences between the two models are slight (Maddala, 1993). The model will be estimated by the maximum likelihood method used in the LIMDEP software.

2.1. Impact of price consciousness, quality consciousness, environmental consciousness and brand loyalty on consumer purchasing decisions towards green products. Consumers are becoming more concerned about the environment. This concern may lead to a higher level of environmental consciousness (Miller and Layton, 2001) and green product purchasing behavior (Roberts, 1996). It is likely that if an individual has greater concern towards the environment in general he/she would most likely purchase green products. It is therefore expected that consumers who are environmentally conscious are more likely to purchase products and services which they perceive to have a positive (or less negative) impact on the environment (Roberts, 1996).

Consumers are price sensitive toward green products and the price attribute will affect consumers' purchasing decision toward green products (Anderson and Hansen, 2004; Ottman, 2000). In order to satisfy environmentally friendly consumers, a green product must also be priced competitively with alternatives (Miller and Layton, 2001). Thus price consciousness (PC) is hypothesized to negatively affect consumers' decision to purchase green products.

Previous studies reported that consumers perceived the performance of green products to be inferior when compared to normal brands (D'Souza et al., 2006; Glegg, Richard, Heard, and Dowson, 2005). As a result, consumers may feel that they are not getting value for money by purchasing green products (Glegg et al., 2005). These attributes are represented as quality consciousness (QC) in our model and are hypothesized to negatively affect consumers' decision to purchase green products.

Brand consciousness (BC) influences the purchasing behavior of the consumers (Assael, 1987). Miller and Layton (2001) suggest that consumers stay with a particular brand to be assured of the consistent performance and quality of the products they purchase. The consumers who are brand consciousness are less likely to desert current brands in favor of others or to try new products such as environmentally friendly products (Rose, 1995). Brand consciousness is represented as BC in the model and is hypothesized to negatively affect consumers' decision to purchase green products.

A consumer decision to purchase green product is hypothesized to be a function of price consciousness, quality consciousness, environmental consciousness, and brand consciousness. Implicitly, the empirical model can be written under the general form:

$$BUY = f(EC, PC, QC, BC, \varepsilon_n), \qquad (5)$$

where $BUY = 1$ if the respondent purchase green products; 0 otherwise; EC (+) = Environmental Consciousness; PC (-) = Price Consciousness; QC (-) = Quality Consciousness; BC (-) = Brand Consciousness; ε = Error term.

The discrete dependent variable, BUY, measures the decision to purchase green products. This dependent variable is based upon the question asked in the mail survey: "Have you purchased a green product in the last 3 months?"

2.2. The effects of product attributes and demographic characteristics on consumer purchasing behavior towards green products. Consumers' decision to purchase green product is hypothesized to be a function of product attrib-

utes, consumers' purchase intentions, and demographic factors. Implicitly, the empirical model can be written under the general form:

$BUY = f$ (*GL, HP, LQ, UB, IU, IB, Gender, Age, Marital Status, Education Level, Income Level, Ethnic Group, NC, ε_n*),   (6)

where *BUY* = 1 if the respondent purchase green products; 0 otherwise; *GL* (+) = Green Label; *HP* (-) = Higher Price (more expensive); *LQ* (-) = Lower Quality, *UB* (-) = Unfamiliar Brand (-); *IU* (-) = Inconvenient to Use (-); *IB* (+) = Intention to Buy (+); *Gender* (+/-) = 1 if respondent is a female; 0 otherwise; *Age* (+/-) = 1 if between the age of 18 and 45; 0 otherwise; *Marital Status* (+/-) = 1 if married or defector; 0 otherwise.

Education Level:

Secondary (+/-) = 1 if high school or less; 0 otherwise; *Trade* (+/-) = 1 if trade qualification; 0 otherwise; *Bachelor* (+/-) = 1 if Bachelor degree; 0 otherwise; *Postgraduate* (+/-) = 1 if Postgraduate qualification; 0 otherwise; *Income Level* (+/-) = 1 if household income $50k or more; 0 otherwise.

Ethnic Group:

Race _1 (+/-) = 1 if New Zealand born European; 0 otherwise; *Race_2* (+/-) = 1 if New Zealand Maori; 0 otherwise; *Race _3* (+/-) = 1 if other European; 0 otherwise; *Race _ 4* (+/-) = 1 if Asian; 0 otherwise; *Race _5* (+/-) = 1 if Pacific Islander; 0 otherwise; *NC* (+/-) = Number of Children; ε = Error term.

Socio-economic characteristics such as gender, age, marital status, education, income, and ethnic group income were hypothesized to influence the respondent's decision to purchase green products. For example, this study determines the probability of green purchase among age and gender groups whether a particular group is more likely to purchase green products than the other. Education was used to determine if more educated consumers would likely purchase green products. For example, the education variable contains five groups: primary only, high school, trade qualification, Bachelor degree, and Postgraduate degree. Only the later four dummy variables were included in the model. This is to avoid dummy variable trap, which results from the perfect multicollinearity with the explanatory variables that include constant term (Greene, 1993). Income was chosen to reflect sensitivity of product prices.

Products with environmentally friendly attributes are typically durable, non-toxic, made from recycled materials, or minimally packaged, and most importantly, have less negative impact on the environment (Ottman and Terry, 1998). Previous studies have also found that consumers would purchase green-labelled products (Bigsby and Ozanne, 2002; Vlosky, Ozanne, Fontenot, 1999). Green label is represented as GL in the model and is measured on a 5-point Likert-type scale. Thus GL is hypothesized to positively affect consumers' decision to purchase green products.

Previous studies suggest that non-green product attributes play an important role in affecting consumers' purchasing decision towards green products (Johri and Sahasakmontri, 1998; Shrum et al., 1995). This includes price, quality, brand, and convenience. Non-green product attributes are represented as NGP in the model and are hypothesized to negatively affect consumers' decisions to purchase green products.

Chan (2001) suggests that consumers' indication of their intention to purchase green products can be used as a predictor of green purchasing behavior. Intention to purchase is represented as IB in the model and is hypothesized to positively affect consumers' decisions to purchase green products.

2.3. Data. Data for this analysis are obtained through a mail survey to 2,000 households in New Zealand. The questionnaire gathered information on the household's attitudes towards green products, intentions to purchase green products, brand loyalty, their concern for the environment, and socio-economic characteristics. The mail survey was designed and implemented according to the Dillman Total Design Method (1978), which has proven to result in improved response rates and data quality. The questions were phrased in the form of statements scored on a 5-point Likert type scale, ranking from 1 "strongly disagree" to 5 "strongly agree". For several of the questions, based on the recommendations of Luzar, Diagne, Gan, and Henning (1995) and Lynne, Casey, Hodges, and Rahmani (1994) the scales have been reversed coded because the questions were posed in a negative or anti-environmental manner.

The names and addresses for this mail survey were drawn randomly from the 2004 New Zealand electoral roll. Of the total 2,000 surveys that were mailed, 600 surveys were returned. After adjusting the sample size for non-deliverable surveys and incomplete or otherwise unusable surveys, the adjusted response rate was 27%. A profile of the sampled respondents is presented in Table 1.

Table 1. Profile of respondents

Variable	Total	Valid percentage	Purchase percentage	Not purchase percentage
Gender:				
Male	296	56.8	41.7	48.1
Female	225	43.2	58.3	51.9

Table 1 (cont.). Profile of respondents

Age group:				
18-25	38	7.3	6.5	9.8
26-35	82	15.7	17.1	12.0
36-45	109	20.9	22.2	17.3
46-55	102	19.5	17.8	24.8
56-65	96	18.4	18.9	16.5
66-75	66	12.6	12.9	12.0
76 and over	29	5.6	4.7	7.5
Marital status:				
Single/never married	81	15.6	14.8	18.2
Married/De facto	373	71.7	72.8	68.9
Widowed/divorced/ separated	66	12.7	12.4	12.9
Number of dependent children:				
0	341	65.3	64.9	66.2
1	60	11.5	12.1	9.8
2	71	13.3	12.9	15.8
3	38	7.3	7.8	6.0
4 and above	12	2.3	2.4	2.3
Education background:				
Primary only	16	3.1	2.1	6.1
3 years secondary	94	18.2	18.0	18.9
School certificate	92	17.8	17.5	18.2
Higher school certificate	54	10.4	9.7	12.9
Bursary/University entrance	65	12.6	13.3	9.8
Trade	62	12.0	12.0	12.1
Bachelor degree	97	18.8	18.8	18.9
Postgraduate degree	37	7.2	8.6	3.0
Household income:				
Under $10,000	27	5.4	4.9	6.9
$10,000 to $19,999	51	10.2	10.4	9.2
$20,000 to $29,999	60	12.0	13.1	8.5
$30,000 to $39,999	72	14.5	13.7	16.9
$40,000 to $49,999	62	12.4	12.3	13.1
$50,000 to $59,999	63	12.7	12.8	12.3
Over $60,000	163	32.7	32.8	33.1
Ethnic group:				
New Zealand born European / Pakeha	392	75.2	74.4	77.4
New Zealand Maori	33	6.3	7.3	3.8
European	68	13.1	2.8	2.3
Canadian	1	0.2	12.4	15.0
Pacific Islander	5	1.0	1.0	0.8
South African	8	1.5	1.8	0.8
Asian	14	2.7	0.3	0.0

Table 1 shows the sample respondents comprised of 56.8% males and 43.2% females. Majority of the respondents are in the 36-45 years (20.9%) and 46-55 years (19.5%) groups, whilst the groups with the lowest percentage are the 18-25 years (7.3%) and over 76 years (5.6%). Majority of the respondents

were married or in a de facto relationships (71.7%) and had no dependent children (65.3%). The highest education level for the majority of the respondents is at the secondary level (59%). The median annual household income of the respondents is between NZ$40,000.00 to NZ$49,999.00. Finally, the main ethnic group is New Zealand born European (75.2%).

Theoretical construct for a priori determination of the factors that influence consumers' purchasing behavior towards green friendly products is not well developed. This research used factor analysis to identify factors affecting consumers' purchasing behavior towards green products. The most frequently used approach is principal components analysis (Cooper and Emory, 1995). This method transforms a set of variables into a new set of composite variables or principal components that are not correlated with each other.

The varimax rotation is performed and items are selected if the factor loadings are greater than 0.30 and loaded on a single factor, and a total of 59.3% of the variance explaining four constructs. The reliability test of each construct was then conducted, Cornbach's Alpha for Price Consciousness (0.712), Quality Consciousness (0.680), and Environmentally Consciousness (0.742) are above 0.60 (Hair et al., 1995), and therefore, these constructs are considered to be reliable. Cronbach's Alpha for Brand Loyalty (0.572) failed to meet the recommended criteria. However, the value is close to 0.60 as recommended and previous literature suggests that modest reliability in the range between 0.50 and 0.60 is acceptable (Shamdasani et al., 1993). Therefore, this construct was retained for the data analysis.

3. Empirical analysis

About 74.5% of the respondents indicated that they purchased green products, while 25.5% of the respondents indicated they did not purchase green products. The respondents were also asked to indicate their intention to purchase green products in the future. A significant proportion (63.2%) of the respondents indicated that they are somewhat likely or very likely to purchase green products in the future, while only 27% of them indicated that they are somewhat unlikely or very unlikely to purchase green products in the future.

3.1. Impact of price consciousness, quality consciousness, environmental consciousness and brand loyalty on consumer purchasing decisions towards green products. The estimated results are presented in Table 2. In general, the model fitted the data quite well. The chi-square test strongly rejected

the hypothesis of no explanatory power and the model correctly predicted 82.2% of the observations. Furthermore, environmentally friendly and brand consciousness are statistically significant and the signs on the parameter estimates support the priori hypotheses outlined earlier.

Table 2. Impact of price consciousness, quality consciousness, environmental consciousness and brand loyalty on consumer purchasing decisions towards green products

Number of observations: 519 Log likelihood function: -254.494 Restricted log likelihood: -294.298 Chi-squared statistics: 79.609 Degrees of freedom: 4 Significance level: 0.000 % Predicted right:: 82.2				
	Coefficients	Std. error	t-statistics	Marginal effects
Constant	-4.018	1.143	-3.514 *	-0.683
BRD CON	-0.305	0.143	-2.135 *	-0.052
ENV CON	1.832	0.238	7.713 *	0.311

Note: * denotes statistical significance at 0.05 level.

The results in Table 2 show that Environmental Consciousness and Brand Consciousness are statistically significant and the signs on the parameter estimates support the priori hypotheses outlined earlier. For example, Environmentally Consciousness positively impacts consumers' purchasing decision on green products and the marginal effect of Environmentally Consciousness on the probability of consumers purchasing green products is 31%. The result is consistent with Roberts's (1996) findings whereby environmentally conscious consumers are expected to score higher than those not so environmentally conscious.

On the contrary, Brand Consciousness negatively impacts consumers' green product purchasing decision and the marginal effect on the probability of consumers purchasing green products is -5.1%. Consumers who have developed brand loyalty to other conventional brands are also less likely to purchase green products. This may be because brand loyalty is hard to break; consumers who are brand loyal are less likely to switch to other brands or try new products (Miller and Layton, 2001).

However, Price Consciousness, and Quality Consciousness are not significant. The results contradict the findings in the literature (D'Souza et al., 2006; Glegg et al., 2005; Anderson and Hansen, 2004; Ottman 2000) that price and quality have significant effect on consumers' green purchasing

decision. This finding may be attributed to that most consumers in New Zealand are already price and quality conscious towards both green and non-green products, therefore not revealing significant consciousness of these two attributes on green purchasing behavior.

3.2. The effects of product attributes and demographic characteristics on consumer purchasing behavior towards green products. The estimated results are presented in Table 3. In general, the model fitted the data quite well. The chi-square test strongly rejected the hypothesis of no explanatory power and the model correctly predicted 77.2% of the observations.

The estimated coefficients indicate that Higher Price and Unfamiliar Brand have a negative impact on the consumers' likelihood to buy green products. The result is consistent with D'Souza et al.'s (2006) and Blend and van Ravenswaay's (1999) findings, whereby higher price has a negative effect on the probability of consumers purchasing green products. Consumers are less likely to purchase green products if the products are more expensive. In addition, consumers are less likely to purchase green products if it is not from a brand that they are familiar with (see Glegg et al., 2005; Johri and Sahasakmontri, 1998). Furthermore, D'Souza et al. (2006) suggest in their study that consumers' perceptions of green products as more expensive and inferior in quality are some reasons that cause their reluctance to switch brands. Purchase Intention is hypothesized to positively affect the probability to buy green products. This finding is consistent with previous finding where green purchase intention is a significant predictor of green purchase behavior (Chan, 2001).

However Green Label is not significant. This may be caused by the inclusion of "no other information" question in the survey questionnaire. D'Souza et al. (2006) argue that some consumers considered the information given on product labels inaccurate and therefore they do not rely on the labels to make purchasing decisions toward green products. Similarly, Lower Quality and Inconvenient to Use are not significant.

The demographic variables of Younger Age group, Postgraduate Degree, and Married are significant and positively impact the probability of consumers' green purchasing decision. Gender, Income, Ethnic, and Number of Children are not significant and they do not have an effect on the probability of consumers' green purchasing decision.

Table 3. The effects of product attributes and demo-
graphic characteristics on consumer purchasing
behavior towards green products

Number of observations: 519			
Log likelihood function :-188.599			
Restricted log likelihood: -282.458			
Chi-squared statistics: 187.718			
Degrees of freedom: 20			
Significance level: 0.000			
% Predicted right:: 77.2			

	Coefficients	Std. error	t-statistics	Marginal effects
Constant	27.922	1515593.100	0.000	2.987
IB	1.085	0.149	7.278 *	0.116
HP	-0.453	0.152	-2.987 *	-0.048
UB	-0.288	0.150	-0.923 **	-0.031
Age	0.598	0.311	1.924 **	0.063
Marital status	0.594	0.338	1.760 **	0.070
P Degree	1.587	0.946	1.678 **	0.104

Note: * denotes statistical significance at 0.05 level; ** denote
statistical significance at 0.10 level.

Additional information can be obtained through
analysis of the marginal effects calculated as the
partial derivatives of the non-linear probability func-
tion, evaluated at each variable's sample mean
(Greene, 2003). For example, the marginal effect of
Purchase Intention has the most positive impact on
the probability of consumers' decision to purchase
green products, revealing that consumers are more
likely (by 11%) to purchase green products if they
have a positive purchase intention. This is followed
by Postgraduate Qualification (.104), Married (.070)
and Younger Age (.063), indicating that a post-
graduate qualification, a married or in a De facto
relationship, and younger age consumers would
contribute to an estimated 10.4%, 7%, and 6.3%
increase in the probability of consumers purchasing
green products, respectively. Similarly, the marginal
effect of Higher Price (-.048) and Unfamiliar Brand
(-.031) indicates that a unit increase in price and
unfamiliar brand result in an estimated 4.8% and
3.1% increase in the probability that customers will
not purchase green products.

Conclusion

The research findings reveal that consumers who are
environmentally conscious are more likely to pur-
chase green products. Traditional product attributes
such as price, quality, and brand are still the most
important attributes that consumers consider when
making green purchasing decision. As D'Souza et
al. (2006) suggest there is an expectation on the part
of consumers that all products offered should be
environmentally safe without a need to trade off
quality and/or pay premium prices for them.

This research reveals that consumers who purchase
green products are between 18 and 45 years old,
hold a postgraduate qualification and have a positive

attitude towards the environment. The results also
showed that consumers who are married or in a De
facto relationship are more likely to purchase green
products. It is possible that this group of consumers
purchase green products because they care about the
health status of their family including their future
generations. Contrary to the expectation, ethnicity
group did not impact consumers' decision to pur-
chase green products. This may be due to the un-
equal sample distribution in this research, since the
majority of respondents are New Zealand European
and other Europeans.

Higher price has a negative effect on the probability
of consumers purchasing green products. Consum-
ers are less likely to purchase green products if the
products are more expensive. This is consistent with
D'Souza et al. (2006) and Blend and van Raven-
swaay's (1999) findings.

Unfamiliar brand also has a significant negative
effect on the probability of consumers' purchasing
green products. Consumers are less likely to pur-
chase green products if it is not from a brand that
they are familiar with. This finding is consistent
with previous studies (see Glegg et al., 2005; Johri
and Sahasakmontri, 1998). D'Souza et al. (2006)
suggest in their study that consumers' perceptions of
green products as more expensive and inferior in
quality are some reasons that cause their reluctance
to switch brands.

Consumers were asked if they are likely to purchase
a product that is labelled "green" given no other
information. Contrary to the expectation, a green
label did not affect consumers' decision to purchase
green products. D'Souza et al. (2006) argue that
some consumers considered the information given
on product labels inaccurate and therefore they do
not rely on the labels to make purchasing decisions
towards green products.

Implications and limitations

This research has provided both theoretical and
managerial implications. In terms of theoretical
implication, this research adds support to previous
research which showed that consumers are con-
cerned about the environment, but they are not nec-
essarily prepared to seek out or buy green products
(Foster, 1989; Wasik, 1992). In addition, this re-
search offers a theoretical basis for understanding
the impact of product attributes on consumers'
green product purchasing behavior and the impor-
tant factors that motivate and/or create barriers to-
wards green products purchasing behavior. While
previous studies have mainly focused on measuring
consumers' general environmental behaviors, this
research provided additional information in narrow-

ing the research gap with regards to understanding consumers' green purchasing behavior. In addition, the results of this research combined with the consumers' profile provide a better understanding of green product purchasers in New Zealand.

In terms of managerial implication, the profile of green product purchasers provides green marketers an indication of their target consumers. The research reveals that traditional product attributes such as price, quality and brand are still the most important ones that consumers considered when making purchasing decision. In order to fulfil individual needs and wants, including ensuring customers' satisfaction, the marketers need to make sure that their products are of high quality and competitively priced. The marketers also need to adopt a better marketing mix for their products in order to change consumers' negative perception towards green products. Successful green marketing entails much more than simply adding an environmental attribute into a product. It is important that marketers integrate green marketing strategies carefully into the company strategic plan.

While this study provides some important contributions to the green marketing theory and for green marketers, there are also limitations and future research agendas. Firstly, the sample used in this research was not equally distributed since majority of respondents are New Zealand European and other Europeans. The research findings may not be generalized to the entire population, since New Zealand is a multicultural society with different ethnic groups. Future studies should use samples which are equally distributed so that more insightful conclusions could be drawn. It would also be interesting to conduct cross-cultural studies. Secondly, the survey has used single item questions, which may have influenced the reliability of the constructs. Future studies should add more items to each construct to improve the reliability.

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