



Environmentally responsible purchase behaviour: a test of a consumer model

A test of a consumer model

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Abstract *A consumer model of environmentally responsible purchase behaviour was tested using covariance structural analysis. The model successfully predicted the purchase of environmentally responsible and non-responsible product alternatives. A hierarchical relationship from values to product specific attitudes to purchase intention to purchase behaviour was confirmed. Individual consequences, which take the personal implications of consumption into account, were found to be just as important in predicting intention as the environmental consequences of a product. The study empirically tested a values typology as a basis to explain attitude formation.*

Introduction

Over the last decade, environmentalism has matured into a significant social issue. Widespread public acceptance of the global environmental crisis has caused a gradual shift in the focus of the environmental movement. The question of how to achieve public acceptance of environmentalism has been replaced by discussions addressing the impact of environmentalism upon public policy (*National Wildlife*, 1995) and corporate policy (for example, see Porter and van der Linde, 1995). For marketers, environmentalism has become a criterion influencing consumer purchase behaviour. In North America, 60 per cent to 90 per cent of consumers are concerned about the environmental impact of their purchases (Dagnoli, 1990, 1991; Klein, 1990). As a group, environmentally responsible products have obtained market share between 20 per cent and 30 per cent in a number of retail product categories (Kohl, 1990).

Environmentally responsible consumption emanated from criticism that the marketing concept ignored the impact of individual consumption upon society as a whole (Feldman, 1971; Kotler, 1972; Lavidge, 1970). In response to "the challenge of rising consumption to human survival", Fisk (1973, p.24) called for government, consumers, and business to consider the environmental costs and benefits when making consumption decisions. Fisk (1973, 1974) stressed that consumers should reduce their consumption of resources in scarce supply and substitute their current products for ones that are ecologically less damaging.

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Webster (1975) defined a socially conscious consumer as a consumer who takes into account the public consequences of his or her private consumption or who attempts to use his or her purchasing power to bring about social change. That is, consumers incorporate social issues into their purchase decisions by evaluating the consequences of their consumption upon society. Consumers who consider the environment to be important will therefore evaluate the environmental consequences associated with the purchase of a product. For example, an individual concerned about the amount of garbage generated (an environmental issue) could consider the disposal of a product's packaging (an environmental consequence) to be important when shopping for products. If the environmental consequences are important enough to the consumer, the result may be the purchase of an environmentally responsible product. These products not only satisfy a consumer's immediate needs and wants, but also serve to benefit the environment in the long term.

Most of the research on environmental responsibility was conducted in the 1970s and 1980s when very few consumers seriously evaluated a product's impact upon the environment. During this time there were few environmentally responsible products available and so many studies of environmental responsibility focused on non-consumption behaviours, such as energy conservation and political activism. Consumption based behaviours have received significant interest recently but most of these studies have focused on post-purchase behaviours, such as recycling and waste separation.

The difficulty with investigating environmentally responsible purchase behaviour has been with its measurement. First, many of the measures are normative in nature and can lead to socially desirable responses (Roozen and De Pelsmacker, 1997). A scale composed of several statements all worded to represent positive environmentally responsible actions can produce a halo-effect that encourages respondents to over-report environmentally responsible behaviours. The result is an inflated level of environmentally responsible behaviour that does not correspond to actual market share data. Second, it is important for researchers to clearly delineate between environmentally responsible intention and behaviour. Environmentally responsible products in general tend to be viewed as the socially acceptable choice which can inflate intention relative to actual behaviour. Confusion between the measurement of these two concepts can be illustrated by the following example. Dahab *et al.* (1995) measured intent by asking respondents to indicate whether a recycling activity was something they are currently doing, something they definitely intend to do, something they may not do, or something they probably will not do. One end of their intent scale (something they are currently doing) is a measure of behaviour. Finally, researchers often combine a wide range of environmental purchase behaviours into a single measure. Studies investigating product purchase behaviour have either used product categories, such as organic foods, or broad generic measures, such as groceries with recyclable packaging. Antil and Bennett (1979) argued that environmental responsibility is a behavioural pattern that is exhibited in degrees, and is not

something that a consumer either has or does not have. Consumers often purchase both environmentally responsible and non-responsible products or exhibit compensating post-purchase behaviours. An example of the latter is a consumer who purchases a product in a non-returnable container but re-uses the container. For this reason Diamantopoulos *et al.* (1994) and Pickett *et al.* (1993) recommended that behaviour should be assessed for specific products and activities rather than general environmentally responsible purchase patterns. Given the rapid growth of environmentally responsible products over the last ten years, the objective of this study was to develop a model that could predict the purchase of a specific type of environmentally responsible product.

The model: antecedents of environmentally responsible purchase behaviour

Over the last five years, researchers investigating environmental responsibility have been interested in combining aspects of the Theory of Reasoned Action (Ajzen and Fishbein, 1980; Fishbein and Ajzen, 1975) with personal values. A hierarchy of values-attitudes-intention-behaviour has served as the conceptual framework for a number of studies; however, it has never been tested in its entirety in the context of predicting the purchase of a specific environmentally responsible product.

The predominant variable used to explain environmental responsibility has been an attitudinal measure of environmental concern (Hines *et al.*, 1987). In general, broad measures of environmental concern have not been found to be highly correlated with environmentally responsible behaviour especially at the individual level (Gill *et al.*, 1986; Schwepker and Cornwell, 1991). Balderjahn (1988) developed a causal model to predict environmentally responsible purchase behaviour, measured by three indicators; buy less packaged products, use returnables, and use fewer detergents. He did not find a significant relationship between attitude toward pollution and purchase behaviour, but did find a weak positive relationship between attitude toward ecologically conscious living and behaviour. Diamantopoulos *et al.* (1994) found weak but significant relationships between a broad measure of environmental attitudes and the purchase of recycled paper products, products not tested on animals, and ozone-friendly aerosols.

A possible explanation for the low correlations between attitude and behaviour is the omission of intentions. According the Theory of Reasoned Action the performance of a specific behaviour is determined by the intention to perform the behaviour (Ajzen and Fishbein, 1980; Warshaw, 1980). In the six studies that examined the intention-behaviour relationship in the environmental context, Hines *et al.* (1987) found a correlation coefficient of 0.49 between the two concepts. Most of these studies used a broad measure of intention developed by Maloney *et al.* (1975). This scale was composed almost entirely of non-consumption behaviours, such as joining an environmental group or riding a bicycle as an alternative to driving a car. Two studies measured intention as the subjective probability to perform a specific

behaviour and found significant relationships between intention and environmental voting behaviour (Gill *et al.*, 1986) and tin recycling behaviour (Kok and Siero, 1985).

The role of intentions in the attitude-behaviour relation is dependent upon the level of effort needed to perform the behaviour (Bagozzi *et al.*, 1990). When much effort is required the cognitive process is more deliberate and results in the formation of intentions. Dahab *et al.* (1995) found that perceived effort was strongly related to the intent to recycle. Most, if not all, environmentally responsible behaviours require additional effort on the part of the individual or involve some personal consequences. Therefore, we expect that the effects of attitudes on behaviour will be mediated by intention.

An environmentally responsible attitudinal measure is typically operationalized by combining statements reflecting concern for a variety of environmental issues (Antil and Bennett, 1979; Balderjahn, 1988; Samdahl and Robertson, 1989; Schwepker and Cornwell, 1991; Tucker, 1980). Gill *et al.* (1986), Olsen (1981), and Samuelson and Biek (1991) argued that a strong correlation between attitude and behaviour could only be obtained when an attitudinal measure and the behavioural measure correspond in specificity. Moderate correlations have been reported between general attitudinal measures and multiple-act behaviours. However, the correlation decreases for general measures and single-act behaviours as there is often a wide variety of specific behaviours that could be expressed from a general attitude (Fishbein and Ajzen, 1974; Sjoberg, 1982; Weigel and Newman, 1976). In an analysis of 51 environmental studies, Hines *et al.* (1987) found that the attitude-behaviour correlation was lower when attitude was operationalized as a general attitude toward the environment in comparison to an attitude toward a specific environmental behaviour. To illustrate, individual differences in the purchase of lead-free gasoline are better predicted by individual differences in attitude toward using lead-free gasoline than by individual differences in attitude toward ecology (Heberlein and Black, 1976). Consequently, if the behaviour of interest is a single act, such as the purchase of a specific environmentally responsible product, then the attitudinal measure must relate specifically to that act.

H1: There will be a positive relationship from attitude towards the environmental consequences (of the purchase of a specific environmentally responsible product) to environmentally responsible purchase intention.

As noted above, one of the difficulties in this area of research has been that consumers often purchase both environmentally responsible and non-responsible products. One explanation for this range of behaviour may be the negative consequences of environmentally responsible behaviour that affect an individual's personal satisfaction. For example, the environmental consequences of using bulk products and refillable containers are reductions in the amount of raw materials used and garbage generated. However,

there are individual consequences, such as the inconvenience of bringing a container to the store, that may be significant enough to override the importance placed on the environmental consequences. Measures of perceived inconvenience or personal effort have been included in studies investigating recycling behaviour. An increase in perceived personal effort was found to directly reduce the intent to recycle (Dahab *et al.*, 1995) and recycling behaviour (Kok and Siero, 1985; McCarty and Shrum, 1994; Thøgersen and Grunert-Beckmann, 1997). Like the product specific environmental attitude, the product specific individual attitude is expected to indirectly affect behaviour through intention.

H2: There will be a negative relationship from attitude towards the individual consequences (of the purchase of a specific environmentally responsible product) to environmentally responsible purchase intention.

Attitudes are based on values: beliefs that transcend specific situations and are used to resolve conflicts or make decisions (Homer and Kahle, 1988). Values are considered to be more stable and more abstract than attitudes, and act as standards upon which a large number of attitudes are based. Attitudes are composed of several beliefs concerning a specific object or act, whereas values are criteria used to evaluate behaviour and people (Schwartz, 1992). Theoretically, values can influence behaviour (Carman, 1977; Williams, 1979); however, because values are the most abstract cognition, values should influence behaviour indirectly through attitudes. Schwartz and Bilsky (1987) provided a comprehensive conceptual definition of values: values are concepts or beliefs, pertain to desirable end states or behaviours, transcend specific situations, guide selection or evaluation of behaviour and events, and are ordered by relative importance (Schwartz and Bilsky, 1990, p. 878). Rokeach (1973) argued that once a value is learned it becomes part of a value system, and it is this system that is used by the individual as a guide to behaviour.

Marketing studies involving values have used three instruments. The first, VALS/VALS2 (SRI International) is used for segmentation studies, but its use has been limited in academic research due to its complexity and proprietary nature. The second, List of Values (Kahle, 1983) was developed to assess the values of Americans. These nine values have been used to investigate a range of concepts from segmentation to product ownership. Homer and Kahle (1988) used structural equation modelling to test the hierarchical relationships between values (LOV), attitude, and behaviour. Although the path coefficients from values to attitude (toward nutrition) to behaviour (natural food shopping) were significant, the chi square statistic indicated a poor fit between the model and the data.

The third type of value measure is Rokeach's (1973) Value Survey, where individuals rank order 30 values. Schwartz and Bilsky (1987) proposed that the impact of values upon attitudes and behaviour can be more effectively interpreted by using a person's value system as opposed to ranking single values, and so they developed a classification typology of Rokeach's (1973) instrumental and terminal values.

Schwartz and Bilsky (1987) initially proposed a value typology based upon a collective-individual dichotomy. Collective values serve the interests of an ingroup, and were categorized into two motivational domains, prosocial and restrictive-conformity. Prosocial values reflect an active concern for the welfare of others and a desire to improve society. Restrictive-conformity values reflect a conscious conformity to social expectations. Opposing collective values are individual values that were subdivided into achievement and enjoyment motivational domains. The achievement values reflect performance in a society, and enjoyment values reflect pleasure and gratification. Schwartz (1990) criticised the typology on three accounts. First, there are values that can serve both individual and ingroup interests, such as wisdom. Second, there are collective values that serve a group beyond the ingroup, such as equality for all. Third, the typology implies that all individual values vary together and in opposition to collective values, which has not been demonstrated.

Schwartz (1992) revised the typology to account for empirical findings and more precise conceptualizations of the motivational domains. The prosocial domain was re-named self-transcendence, and it was composed of values that reflect the extent to which they motivate people to transcend selfish concerns and promote the welfare of others, close and distant, and of nature. Self-transcendence includes values reflecting benevolence, a concern for the welfare of people with whom one is in frequent personal contact, and universalism, encompassing a broader concern for all people and nature. We viewed self-transcendence as a social-altruistic value orientation (Stern *et al.*, 1995) and so did not include any of the biospheric values. Thøgersen and Grunert-Beckmann's (1997) social-altruistic value cluster was found to negatively relate to beliefs about the cost consequences (individual consequences) of recycling and waste prevention, and to positively relate to beliefs about the beneficial consequences (environmental consequences) of waste prevention. In another study of recycling solid wastes, McCarty and Shrum (1994) developed three new collectivist items as the LOV value items are individualistic. They found that these collectivist items were negatively related to a measure of recycling inconvenience but did not affect a measure of the importance of recycling. We hypothesized that the self-transcendence values would positively affect environmental attitude. That is, a strong underlying concern for the welfare for others would lead to a higher level of importance placed on the environmental consequences of a product because a product that damages the environment would be detrimental to society. In addition, we expect these individuals to place less importance on the individual consequences because they will sacrifice personal concerns when the resulting behaviour benefits the common good.

H3: There will be a positive relationship from self-transcendence values to attitude towards the environmental consequences of a product.

H4: There will be a negative relationship from self-transcendence values to attitude towards the individual consequences of a product.

The restrictive-conformity domain was re-named conservation to reflect a need to preserve the status quo and the certainty it provides in relationships with close others, institutions and traditions. Conservation comprised two types of values, conformity and security. A third value group, tradition, representing respect for one's cultural symbols and practices was not included in the study because we felt that tradition would be a constant within the sample. Conformity values reflect restraint of actions likely to upset others or violate social norms, and security values underlie the achievement of safe and stable social relationships. Thøgersen and Grunert-Beckmann (1997) found that conservation values were negatively related to beliefs about the beneficial consequences of recycling and positively related to the cost consequences of waste prevention. We propose that individuals who place a high level of importance on conservation values do not want to complicate their lives through change or do not want to be involved with something that is not the norm. Even though the majority of people are concerned about the environment in general, the use of specific environmentally responsible products is not the norm. Therefore, we hypothesize that these respondents will place a low level of importance on how the product directly impacts upon the environment, and will place a high level of importance on how the product will directly affect them.

H5: There will be a negative relationship from conservation values to attitude towards the environmental consequences of a product.

H6: There will be a positive relationship from conservation values to attitude towards the individual consequences of a product.

The individualistic values were re-named self-enhancement. These values reflect the extent to which they motivate people to enhance their own personal interests. Two values, happiness and cheerful, were deleted from the enjoyment domain to form a domain termed hedonism. This domain reflects pleasure or sensuous gratification for oneself. The achievement values were reorganized so that they reflect personal success within a society. A new domain, power, was created to reflect the attainment of social status and control over people and resources. Hedonism, achievement, and power, are all concerned with a self-centred orientation about one's physical needs and success. Self-enhancement values were not included in the study by Thøgersen and Grunert-Beckmann (1997), but these values are similar to McCarty and Shrum's (1994) self-gratification value factor. This factor was found to negatively affect the importance of recycling. We propose that the goals of self-indulgence and personal gratification are consistent with positive attitudes towards the individual consequences and negative attitudes toward environmental consequences. That is, respondents who place a high importance on self-enhancement values are expected to be very concerned about how a product will directly affect them, even at the expense of others.

H7: There will be a negative relationship from self-enhancement values to attitude towards the environmental consequences of a product.

H8: There will be a positive relationship from self-enhancement values to attitude towards the individual consequences of a product.

Schwartz's (1992) final value dimension, openness to change, was composed of self-direction and stimulation value clusters. Self-direction reflects independent thought and action, while stimulation represents a need for variety. Openness to change values have not shown any direct effects on environmental attitudes (Stern *et al.*, 1995; Thøgersen and Grunert-Beckmann, 1997) and were omitted from the study. The next section explains the focus of the study, how the measures were operationalized, and the sample used for model testing.

Model operationalization

The model was operationalized for the purchase of the baby diaper. Diapers have two product alternatives, disposable diapers and re-usable cloth diapers washed at home or at a laundromat. Disposable diapers made with unbleached paper and re-usable cloth diapers washed by a diaper service company were not widely available in the study area. The prevailing public perception has been that disposable diapers are environmentally non-responsible and cloth diapers are responsible (Becker *et al.*, 1990; Isaacs, 1991). They, therefore, appeared to be a suitable product purchase to assess environmentally responsible purchase behaviour. A survey of outside experts, members of Canada's oldest environmental organization – The Ecology Action Centre – was used to determine the relative rankings of environmental responsibility for the two product alternatives. A sample of 19 experts, ranked the two product alternatives from 1 (not environmentally responsible) to 10 (environmentally responsible). The cloth diapers were perceived to be significantly more environmentally responsible than the disposable diapers ($\mu_{\text{Disposable}} = 1.38$, $\mu_{\text{Cloth}} = 9.56$, $t\text{-value} = -32.02$, $p < 0.001$).

Pilot study

A difficulty in developing attitudinal measures of environmental responsibility is the selection of environmental issues to be included in the scale. The substantive issues used are often determined by the researcher a priori and cover a wide range of topics from general problems such as pollution and overpopulation to more specific problems such as packaging legislation and product boycotts. This is problematic as measures containing different substantive issues are not comparable and the substantive issue used can affect the relationships between the measure and other variables (Van Liere and Dunlap, 1981). The question of which substantive issue to choose is further complicated by the fact that issues gain and lose importance over time. For example, some studies in the 1970s had scale items that referred to the use of unleaded or leaded gasoline, yet leaded gasoline is no longer sold in North America. Furthermore, as new issues such as global warming and ozone

depletion gain public attention, they must be included in the possible set of issues. To minimize these problems, a pool of sample items was generated for each attitudinal variable using focus groups of disposable diaper users, cloth diaper users, and environmentalists. Items were structured for a five point Likert scale from strongly agree to strongly disagree. A questionnaire containing the two item pools was administered by mail to a sample of current diaper users, women who had a child in the last 6 to 12 months. Usable questionnaires were returned by 334 respondents, a response rate of 62 per cent. Four studies operationalized Churchill's (1979) scale construction paradigm to develop scales relating to environmental concern: Antil and Bennett (1979) (also see Antil, 1984), Bejou and Thorne (1991), Bohlen *et al.* (1993) and Leigh *et al.* (1988). A four-step procedure was used for item purification, which closely followed the methodologies used in these studies.

For each pool, the item with the lowest item-to-total correlation below 0.4 (Antil and Bennett, 1979) was deleted and the correlations were then recalculated for the remaining items. This step was repeated until all the remaining items had item-to-total correlations above 0.4. The second step, used as a follow-up to the correlation analysis by Antil and Bennett (1979) and Bejou and Thorne (1991), was based on Antil and Bennett's (1979) argument that an item's ability to discriminate between respondents can serve as a basis for item selection. As the scales were being designed to discriminate between the disposable and cloth user groups, item means should be significantly different between these two groups. *T*-tests were used to eliminate items that did not have significantly different mean scores at $p < 0.05$. The third step was a factor analysis with both the environmental and individual consequences item pools to confirm that each set of items was unidimensional. An item was eliminated if it did not have a loading above 0.4 (Ford *et al.*, 1986) on its primary factor. The objective of the first three steps was to produce scales that were reliable. As a final step, Churchill (1979) suggested that there should be evidence of construct validity, that is, do the scales "behave as expected" (p. 72). Discriminant analysis of the environmental and individual consequences item pools was used to provide a test of known group validity. Classification matrices were constructed using the split-sample technique (Frank *et al.*, 1965; Perreault *et al.*, 1979). Evidence of validity was provided if the total percentage of correct predictions exceeded the maximum chance criteria and if this percentage was statistically better than chance (Press's *Q*).

The item pool for the attitudinal measure Environmental Consequences contained 12 items that reflected the negative environmental consequences of using disposable diapers and the positive environmental consequences of using cloth diapers, for example "It is important to me whether a diaper adds to a landfill site". The contribution to garbage by disposable diapers is a negative environmental consequence. Strong agreement with the statement is indicative of high salience of the environmental consequences of diapers. Cronbach alpha for the 12 items was 0.76. Seven items were eliminated in the correlation

analysis and the final Cronbach alpha was 0.78. For the remaining five items, the mean scores were found to be significantly different ($p < 0.05$) between the disposable and cloth user groups.

For individual consequences, seven items reflected the positive individual consequences of using disposable diapers and the negative individual consequences of using cloth diapers, for example "It is important to me that a diaper comes in a wide range of sizes". Cloth diapers come in a limited range of sizes which is a negative individual consequence. Strong agreement with the statement is indicative of high salience of the individual consequences of diapers. Cronbach alpha for the seven items was 0.71. Three items were eliminated in the correlation analysis and the Cronbach alpha for the four remaining items was 0.75. The mean scores for the remaining four items were significantly different between the cloth and disposable user groups.

In the factor analysis, the five items representing Environmental Consequences loaded above 0.4 on the first factor and the four items for Individual Consequences loaded above 0.4 on the second factor. The discriminant function generated from the discriminant analysis was able to correctly classify 85.5 per cent of respondents, which is above the maximum chance criteria (77.2 per cent). Press's Q was above the critical value indicating that the total percentage is significantly higher than chance.

Main study

Churchill (1979) recommended that hypotheses testing should be conducted on a second sample, one not used to develop measures. A self-administered questionnaire was given to 1,000 women following the birth of their baby in a maternity hospital in Nova Scotia, Canada. In order to get an accurate measure of diaper intention it was important to have the questionnaires administered at a point as close to the birth of the baby as possible. We did not want the respondents to go home after the birth and possibly complete the questionnaire weeks after they had made the purchase decision. Therefore, the questionnaire was given to new mothers immediately following the birth as part of the hospital orientation material. In Canada, the usual time spent in a hospital following a birth is 48 hours, and this time period is often busy with information sessions, family visits, taking care of the baby, and recuperation. As a result, the sample size of 160, was somewhat low but this was due to the need to accurately measure intention. Diaper usage for the sample was comparable to national market share data for disposable and cloth diapers. In addition, no differences were found between the sample and the population of the maternity hospital in terms of age, number of previous children, or education.

The questionnaire contained the nine attitudinal items identified in the pilot study and marker values from Schwartz's (1992) typology: Self-Transcendence (universalism and benevolence), Conservation (conformity and security), and Self-Enhancement (hedonism, achievement, and power). To allow for the examination of an organized system of values each value item was measured

using a seven point rating scale from totally important to totally unimportant in response to the question; "How important are the following words to you, as guiding principles in your life?" A factor analysis was conducted to confirm the unidimensionality of each variable (Baumgartner and Homburg, 1996). See Table I for the factor analysis results and the Appendix for the scale items. All items loaded on their factors above 0.4 and the reliabilities were within Peter's (1979) acceptable range for basic marketing research.. The items for each variable were summed to form composite scales.

Intention was measured as the individual's estimation of the likelihood of actually performing the behaviour in the future (Warshaw and Davis, 1985).

Item	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
<i>Environmental consequences</i>					
Diaper adds to landfill	0.1041	0.7427	- 0.0518	0.0135	0.1525
Diaper depletes forests	0.0738	0.8707	- 0.0366	0.0170	0.0088
Diaper may affect environment	0.1327	0.8605	- 0.0378	0.0991	0.0930
Worry how diaper affect environment	0.0946	0.7034	- 0.0205	- 0.0719	- 0.1411
Energy used to make a diaper	- 0.0061	0.6077	0.0464	- 0.1259	- 0.2162
<i>Individual consequences</i>					
Diaper fits properly	- 0.0780	- 0.0874	0.0813	0.7085	0.3891
Diaper convenient to use	- 0.0359	- 0.1157	- 0.0720	0.6271	0.3800
Diaper absorbent	- 0.0794	- 0.0371	0.1309	0.7890	- 0.0401
Diaper in range of sizes	- 0.0062	0.0705	0.0086	0.8463	0.0914
<i>Self-transcendence</i>					
Equality	0.8131	0.1963	0.1998	- 0.0576	0.0795
Helpful	0.7870	0.2387	0.2028	- 0.0656	- 0.0022
Forgiving	0.7724	0.1241	0.2359	- 0.0753	- 0.1064
Loving	0.8777	- 0.0060	0.1617	- 0.0523	0.0180
<i>Conservation</i>					
Self-controlled	0.3175	0.0509	0.6400	- 0.0724	0.2226
Obedient	0.2993	- 0.0173	0.7567	0.0557	- 0.2574
Polite	0.3338	0.0056	0.7280	0.1078	- 0.0180
Clean	0.3509	- 0.1259	0.7060	0.0963	- 0.1202
<i>Self-enhancement</i>					
Ambitious	0.0998	- 0.0490	0.3811	0.0614	0.7467
Pleasure	0.2001	0.0163	0.1167	- 0.0233	0.6710
Social recognition	0.3062	0.0415	0.3168	- 0.0518	0.6694

Notes:

- Cronbach's alpha
- Environmental Consequences items 0.82
- Individual Consequences items 0.71
- Self-Transcendence items 0.89
- Conservation items 0.80
- Self-Enhancement items 0.64

Table I.
Factor analysis of
items for
environmental and
individual
consequences

Each respondent was asked to estimate the percentage of cloth diapers she will use in the first three months following the birth of her child. The higher the percentage of cloth diapers the respondent intended to use the higher the Environmentally Responsible Purchase Intention. Three months following the birth, respondents were contacted by telephone to determine the actual percentage of cloth diapers used. The higher the percentage of cloth diapers purchased by the consumer over the past three months, the greater Environmentally Responsible Purchase Behaviour was exhibited. Diaper usage for the sample is summarized in Table II.

Model estimation

To test the hypotheses, a covariance matrix of the measures was generated using PRELIS 2.14 (Jöreskog and Sörbom, 1993a) and the model was estimated using LISREL 8 (Jöreskog and Sörbom, 1993b) with the maximum likelihood procedure. The model is shown in Figure 1. Variable skewness, kurtosis, and the test for multivariate normality are shown in Table III. The only two variables with serious deviations from normality were Environmentally Responsible Purchase Behaviour and Environmentally Responsible Purchase Intention. However, by definition, these variables should have a bi-modal distribution as most consumers use or intend to use either 100 per cent disposable diapers or mostly cloth diapers. The assumption of multivariate normality will be addressed in the discussion of limitations. The ratio of observations per number of estimated parameters was at an acceptable level of ten (Hulland *et al.*, 1996).

The parameter estimates for the path coefficients are shown in Table IV. All variables were measured by a single indicator, so the loading between each construct and its underlying latent variable was fixed at 1.0 and the error variance was fixed (Anderson and Gerbing, 1988). For the variables using a composite of items (Environmental and Individual Consequences, Self-Transcendence Values, Conservation Values, Self-Enhancement Values), the error variance was fixed at (1-Cronbach alpha) times the variance of the indicator (Baumgartner and Homburg, 1996). Error variance for the two one-item indicators (Environmentally Responsible Purchase Behaviour and

	Disposable (%)	Cloth (%)	Number	% of sample
Purchase intention	100	0	53	33.1
	51-99	1-49	35	21.9
	0-49	51-100	72	45.0
Total			160	
Purchase behaviour	100	0	96	60.0
	51-99	1-49	14	8.8
	0-49	51-100	50	31.2
Total			160	

Table II.
Product usage by
respondent

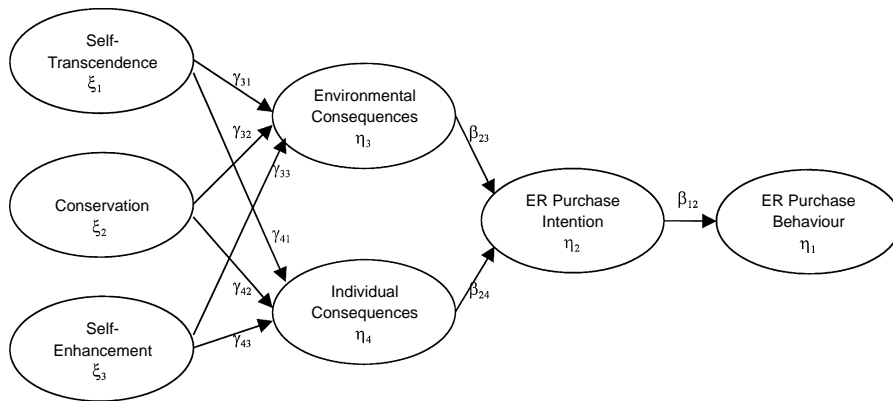


Figure 1. Hypothesized model of an environmentally responsible purchase

Variable	Skewness			Kurtosis		
	Value	z-score	<i>p</i>	Value	z-score	<i>p</i>
ER purchase behaviour	0.763	3.816	0.000	- 1.281	- 9.213	0.000
ER purchase intention	0.076	0.381	0.352	- 1.673	40.880	0.000
Environmental consequences	- 0.626	- 3.131	0.001	0.697	1.677	0.047
Individual consequences	- 0.554	- 2.770	0.003	0.110	0.545	0.293
Conservation values	- 0.524	- 2.618	0.004	- 0.413	- 1.040	0.149
Self-enhancement values	- 0.201	- 1.007	0.157	- 0.821	- 3.167	0.001
Self-transcendence values	- 0.448	- 2.240	0.013	0.227	0.808	0.210

Notes:

Multivariate normality

Skewness: z-score = 13.065, *p* = 0.000

Kurtosis: z-score = 3.688, *p* = 0.000

Skewness and Kurtosis: $\chi^2 = 184.301$, *p* = 0.000

Table III. Tests of univariate and multivariate normality

Intention) was fixed at a high level of 20 per cent times the variance (Hayduk, 1987). A sensitivity analysis was conducted for each latent variable, varying the estimated error from 10 per cent to 30 per cent. The chi square value did not significantly change within these error limits, thus providing confidence in the error estimates. The fit statistics indicated a satisfactory fit between the model and the data: $\chi^2(9) = 15.76$, *p* = 0.072, RMSEA = 0.071, *p-value for test of close fit* = 0.24, RMR = 0.060, GFI = 0.97, AGFI = 0.91, NFI = 0.95, NNFI = 0.95, CFI = 0.98, IFI = 0.98, RFI = 0.89.

The objective of the model was to predict Environmentally Responsible Purchase Behaviour. The path from Environmentally Responsible Purchase Intention to Environmentally Responsible Purchase Behaviour (β_{12}) was significant and 74 per cent of the variance in Environmentally Responsible Purchase Behaviour was explained by the model. Removing Environmentally Responsible Purchase Intention from the model reduced the amount of

Relationship	Parameter	Estimate	t-value	Hypothesis
<i>Basic model</i>				
ER purchase intention -> ER purchase behaviour	β_{12}	0.86	11.06	
Environmental consequences -> ER purchase intention	β_{23}	0.55	7.49	H1 supported
Individual consequences -> ER purchase intention	β_{24}	-0.63	-8.57	H2 supported
Self-transcendence values -> Environmental consequences	γ_{31}	0.48	4.01	H3 supported
Self-transcendence values -> Individual consequences	γ_{41}	-0.20	-1.68*	H4 not supported
Conservation -> Environmental consequences	γ_{32}	-0.30	-2.00	H5 supported
Conservation -> Individual consequences	γ_{42}	-0.02	-0.14*	H6 not supported
Self-enhancement values -> Environmental consequences	γ_{33}	-0.02	-0.16*	H7 not supported
Self-enhancement values -> Individual consequences	γ_{43}	0.37	2.77	H8 supported
<i>Alternative models</i>				
Environmental consequences -> ER purchase behaviour	β_{13}	-0.06	-0.57*	Rejected
Individual consequences -> ER purchase behaviour	β_{14}	-0.08	-0.68*	Rejected
Self-transcendence values -> ER purchase intention	γ_{21}	-0.01	-0.14*	Rejected
Conservation values -> ER purchase intention	γ_{22}	0.05	0.75*	Rejected
Self-enhancement values -> ER purchase intention	γ_{23}	0.08	1.09*	Rejected
Note: * Path coefficient not significant at 0.05				

Table IV.
Structural model
results

explained variance in Environmentally Responsible Purchase Behaviour from 74 per cent to 56 per cent. *H1* and *H2* were supported as the path coefficients from Environmental Consequences (β_{23}) and Individual Consequences (β_{24}) to Environmentally Responsible Purchase Intention were significant, similar in magnitude, and opposite in sign. Paths inserted between Environmental Consequences and Individual Consequences (β_{34} and β_{43}) were not significant, indicating that these concepts are unique and distinct. To determine the importance of intention in the model, direct relationships were specified between Environmental Consequences and Environmentally Responsible Purchase Behaviour (β_{13}), and Individual Consequences and Environmentally Responsible Purchase Behaviour (β_{14}). To test these relationships, an alternative nested model was specified containing the additional path coefficients. If the chi-square difference between the initial and nested models is non-significant, the constraint imposed by the initial model should not be rejected (Anderson and Gerbing, 1988; Bagozzi and Yi, 1988). The path coefficients and the chi-square difference between the two nested models were not significant for both relationships, thus indicating that the product specific attitudes affect behaviour indirectly through intention. The results suggest that faced with a specific product decision, an individual will evaluate both the environmental and individual consequences associated with consuming a product. Greater importance placed on the environmental consequences indirectly increases environmentally responsible purchase behaviour, and higher salience towards the individual consequences indirectly increases the purchase of the environmentally non-responsible product alternative.

Self-Transcendence values were found to be positively related to Environmental Consequences (γ_{31}), thus supporting *H3*. The results indicate that motivation to promote and enhance the welfare of others underlies positive environmental attitudes, which can then lead to the purchase of an environmentally responsible product. The path between Self-transcendence values and Individual Consequences (γ_{41}) was significant at 0.1 not 0.05, thus *H4* was not supported. The results provide some weak evidence that individual consequences may be reduced by high importance levels on Self-transcendence values.

The relationship between Conservation values and Environmental Consequences (γ_{32}) was significant and negative as stated in *H5*. A strong motivation to maintain social norms and personal stability in one's life reduces positive environmental attitudes. Despite the widespread general concern for the environment, the market share of cloth diapers is much smaller than disposable diapers, therefore attitudes towards the positive environmental consequences of cloth diapers is not the societal norm and so individuals motivated to adhere to the norm would find these attitudes unacceptable. Contrary to Thøgersen and Grunert-Beckmann (1997), Conservation values were not found to significantly influence Individual Consequences (γ_{42}). Because the items used to operationalize individual consequences are personal and have little social visibility, the lack of influence from values reflecting a restraint of actions likely to upset others is understandable.

Self-Enhancement values were found to be positively related to Individual Consequences (γ_{43}) but not Environmental Consequences (γ_{33}). Individuals who are highly concerned about their own personal needs and success are not willing to endure any negative individual consequences of using the environmentally responsible product alternative. A high level of concern for the individual consequences then leads to the purchase of the product with the lowest individual consequences, the environmentally non-responsible product.

Three alternative models were tested to examine direct relationships between the values variables and purchase intention. The parameter estimates for these paths (γ_{21} , γ_{22} , γ_{23}) and the chi square differences were not significant indicating that models containing these paths should be rejected. Evidence of an indirect relationship between values and behaviour through attitudes supports similar research with organic foods (Grunert and Juhl, 1995; Homer and Kahle, 1988) and recycling solid wastes (McCarty and Shrum, 1994).

Discussion

The growing number of consumers demanding environmentally responsible products and the need to remain competitive has prompted many marketing managers to seek information concerning environmentally responsible purchase behaviour. Much of the past research in this area has focused on non-consumption environmental behaviours, such as recycling and voting behaviours. Consumption based studies have focused on organic foods or a group of environmentally related products. Given the growth of the number

of environmentally responsible products and the positive change in consumers' concern for the environment, there is a need to examine the purchase behaviour of specific environmentally responsible products.

The supported hypotheses of this study confirm the theoretical relationships from abstract cognitions to specific behaviour, a values-attitudes-intentions-behaviour hierarchy. Direct relationships were not found between values and intention or attitudes and behaviour; therefore, omitting one variable in the chain of interrelated variables greatly reduces the predictive power of the model. The decision to purchase an environmentally responsible product or a non-responsible product alternative requires a deliberate conscious evaluation of the environmental and individual consequences associated with the product purchase. Individuals who felt that the environmental consequences of purchasing disposable diapers were important, were more likely to intend to purchase cloth diapers. In addition, those who felt that the individual consequences of using cloth diapers, such as limited sizes, convenience, fit, and absorbency, were important, were more likely to intend to purchase disposable diapers. It appears that intention is formed as the end result of an evaluation or trade-off between the environmental and individual consequences. The strong influence of the individual consequences on intention explains why some consumers can express high levels of environmental concern but do not exhibit pro-environmental behaviours. That is, the influence of positive environmental attitudes on intention are negated by the negative attitudes towards the individual consequences. The results are consistent with recent findings in studies investigating the relationship between inconvenience and recycling behaviour (Dahab *et al.*, 1995; McCarty and Shrum, 1994; Thøgersen and Grunert-Beckmann, 1997). This study underscores the importance of using a fully operationalized model for research involving environmentally responsible purchase behaviour. Perhaps because of the difficulty of collecting both pre-purchase and post-purchase data, the variable intention has been frequently omitted from models of environmental responsibility. Given the finding that the relationship between attitude and intention is indirect, the low correlation between environmental attitudes and behaviour reported in many of these studies is not surprising. The results support Bentler and Speckart's (1981) argument that the elimination of intention leads to a more parsimonious model, but one that is simpler than reality.

Our study contributes to a growing body of literature that purports the use of values in the study of attitude formation. Schwartz (1992) (and Schwartz and Bilsky, 1987) proposed that domains of values would allow researchers to specify a priori relationships involving certain values. Schwartz and Bilsky (1987) argued that the prediction of attitudes by values would be more reliable and clear when a number of value domains are used as opposed to the traditional ranking of values where one value is ultimately chosen. This study provides important evidence that the domains postulated by Schwartz (1992) can be used to generate and test hypotheses.

As expected, self-transcendence was positively related to environmental attitudes about disposable diapers. The more an individual holds benevolence and universalism as important guiding principles, the more likely they are to hold positive environmental attitudes. That is, a concern for the welfare of others indirectly results in an intention to purchase an environmentally responsible product. However, an absence of concern for the welfare of others did not significantly reduce individual attitudes that may affect personal satisfaction. In contrast, self-enhancement values were found to exert effects that were in opposition to self-transcendence. Individuals who are self-indulgent were found to be very concerned about how a diaper may impact upon their personal satisfaction. These results provide empirical support for Schwartz's (1992) argument that the self-transcendence values are in conflict with the self-enhancement values; "acceptance of others as equals and concern for their welfare interferes with the pursuit of one's own impulses and acceptance of externally imposed limits" (Schwartz, 1992, p. 15). The third values variable, conservation, was found to be negatively related to environmental attitudes. That is, the more conservative an individual is, the less likely that she will hold a positive environmental attitude and therefore, the less likely she intends to make an environmentally responsible purchase. Our results supports similar studies examining the role of values as determinants of attitude formation for recycling behaviour and the purchase of organic foods in general (see Grunert and Juhl, 1995; McCarty and Shrum, 1994; Stern *et al.*, 1995; Thøgersen and Grunert-Beckmann, 1997). We have extended these relationships and found that they hold at the product level.

There are several important implications of our work for marketing managers. First, in order to increase purchase intention of an environmentally responsible product, consumer promotion should address both environmental and individual product consequences. To change environmental attitudes, communications must explain the positive environmental consequences of the product and the negative consequences of the non-responsible product alternative. It is important that any communications focus on the product specific consequences, not generalized environmental consequences. For example, a company marketing environmentally responsible paint should not discuss the problems of global warming or waste management, but should address the specific hazards and disposal problems associated with the toxic compounds in competitive brands of non-responsible paint. As we noted above, it is not enough to just promote the positive consequences of an environmentally responsible product. Attempts must be made to reduce the negative individual consequences of an environmentally responsible product as well. Packaging and advertising could aim to communicate that the product is not as inconvenient or as difficult to use as the consumer might think. For example, packaging for cloth diapers could outline efficient procedures for handling and washing soiled diapers or provide instructions for properly fitting the diaper (these were both salient in this study). Individual consequences could also be used to direct research and development for

environmentally responsible products. Understanding the salient negative individual consequences and then modifying the product to reduce these consequences is an important strategy to bring about attitudinal change. It is, therefore, important for managers to adopt a proactive stance that will allow them to develop products that can satisfy a consumer's personal satisfaction as well as the long-term welfare of society.

An implication for public policy makers concerns the importance society places on individual consequences. In order to increase environmentally responsible intention, the importance placed on the individual consequences needs to be reduced. De-marketing individual consequences such as convenience, ease of use, and disposability will serve to reduce their importance as standards upon which products are evaluated. From a consumer's perspective this could complicate the purchase situation as it is usually easier to evaluate product attributes associated with individual consequences than environmental consequences. Furthermore, despite high levels of general environmental knowledge, there does not seem to be strong normative pressure to use environmentally responsible products. Public policy makers and environmentalists interested in promoting environmentally responsible behaviour may wish to develop normative pressure. Advertisements could be used that portray individuals exhibiting environmentally responsible behaviour as valued members of society.

The final implication concerns the use of values to stimulate attitudinal change. As values are desired end states, environmentally responsible attitudes and intentions can be portrayed as a means to achieving the values. That is, communications can promote an environmental consequence as being consistent with a particular value orientation. For example, the reduction in landfill sites resulting from using cloth diapers could be portrayed as beneficial to the welfare of others, which is a desired end state for those holding strong self-transcendence values. These consumers would then adopt positive environmental attitudes to support their value orientation.

Limitations and further research

The assumption of multivariate normality for the intention and behaviour variables was violated by the data. However, no improper solutions were found and the sample size is sufficient so one can assume that the parameter estimates and their associated errors will be approximately multivariate normally distributed.

The study was restricted to the investigation of one type of product. Diapers are a high-involvement product for most mothers with babies, and usually represent a substantial investment of time and money. The product is somewhat unique in that we were able to identify the beginning of a time period when purchasing would occur. Thus, from a theory-testing perspective the product works well because it was possible to get very clean measurements of intention and behaviour. The model should be tested with a number of low-involvement products that are purchased on a regular basis, such as paper

products and detergents. Because a person's value orientation is relatively stable over time it would be interesting to determine if values affect attitudes to some products more than others, and if so, why?

Many products now on the shelves can involve non-consumption post-purchase environmental behaviours such as recycling, sorting, and composting. Incorporating these behaviours into the model would allow the researcher to investigate the influence of compensatory behaviours on purchase behaviour. Measurements of non-consumption behaviours should be product specific, not general. For example, consumers should be asked if they plan to return a particular container to a recycling depot, as opposed to whether they recycle or not.

The population sampled was primarily young married women, who were new mothers. It is possible that there could be differences in the value orientation between the sample and the general population. However, the product, diapers, is mostly purchased by the population sampled and so the interrelationships between variables are valid and not problematic. Given the narrow demographic characteristics of the sample, one should be cautious when interpreting the results for the general population. Generalizability could be increased by applying the model to products used by a broader range of consumers.

Conclusion

This study provides a methodology to investigate the purchase of an environmentally responsible product and provides a theoretical contribution to understanding the determinants of this type of purchase behaviour. A rigorous procedure was followed to develop reliable and valid measures of product specific environmental and individual consequences. The hierarchical structure proposed in the model from abstract values, to product specific attitudes, to intention, to purchase behaviour was confirmed. The interrelationships between the variables are important in terms of designing persuasive communications to influence purchase intention and behaviour.

A second key finding of this study is that both the environmental and individual consequences of purchasing diapers were linked to behaviour through intention. The behavioural outcome appears to be a trade-off between environmental and individual consequences. Third, the study supports the use of values in the study of attitude formation with the value domains proposed by Schwartz (1992) to generate and test hypotheses. Finally, the findings emphasize the importance of including the intention variable in models predicting environmentally responsible purchase behaviour. The failure to do so in some previous studies may have contributed to the low correlation hitherto found between environmental attitudes and behaviour.

There now seems to be considerable demand for products that not only satisfy a consumer's immediate needs but also benefit the environment in the long term. Marketing managers must realize that the criteria used by consumers to evaluate products have changed. Consumers now consider the

environmental consequences of products before making their purchase decisions. A product that has negative environmental consequences can be severely disadvantaged as consumers consider the impact of that product upon the environment. However, a product with positive environmental consequences can be discarded if the consequences to the individual are considered to be significant enough. Faced with a product decision individuals evaluate both the environmental and individual consequences associated with consuming a product and then form purchase intentions based on the outcome of the evaluation.

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Appendix. Items for composite scales

Environmental consequences (Y₃)

- (1) How a diaper may affect the environment is important to me.
- (2) It is important to me whether a diaper adds to a landfill site.
- (3) It is important to me whether a diaper causes the depletion of forests.
- (4) I feel people worry too much about how disposable diapers may affect the environment. (reverse scale).
- (5) The amount of energy used to make a diaper is not important to me. (reverse scale)

Individual consequences (Y₄)

- (1) It is important to me that diapers come in a wide range of sizes.
- (2) It is important to me that a diaper be convenient to use.
- (3) It is important to me that a diaper is very absorbent.
- (4) It is important to me that a diaper fits my baby properly.

Self-transcendence values (X₁)

- (1) Universalism – Equality (brotherhood, equal opportunity for all).
- (2) Benevolence – Helpful (working for the welfare of others).
- (3) Benevolence – Forgiving (willing to pardon others).
- (4) Benevolence – Loving (affectionate, tender).

Conservation values (X₂)

- (1) Conformity – Self-controlled (restrained, self-disciplined).
- (2) Conformity – Obedient (dutiful, respectful).
- (3) Conformity – Polite (courteous, well-mannered).
- (4) Security – Clean (neat, tidy).

Self-enhancement values (X₃)

- (1) Achievement – Ambitious (hard-working, aspiring).
- (2) Hedonism – Pleasure (an enjoyable, leisurely life).
- (3) Power – Social recognition (respect, admiration).