

# The Influence of Environmental Values on Green Purchase Behaviour: Direct, Indirect, or Both?

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Received: September 22, 2015

Accepted: October 13, 2015

Online Published: November 25, 2015

doi:10.5539/ijbm.v10n12p234

URL: <http://dx.doi.org/10.5539/ijbm.v10n12p234>

## Abstract

This paper aims to examine the influence of environmental values on green purchase behaviour through environmental attitude only, green purchase attitude only, or a combination of both from Malaysian consumers' perspectives. The result shows that the unidimensional structure of environmental values from the combination of altruistic and biospheric values does not directly influence green purchase behaviour. It demonstrated an indirect effect on green purchase behaviour via environmental attitude (two-path mediated effect) as well as through a combination of both environmental attitude and green purchase attitude (three-path mediated effect). A specific attitude towards green purchases acts as a better predictor of green purchase behaviour, as compared to the general attitude towards the environment. This offers a useful insight to the practitioners in better formulating and implementing marketing strategy to go green in Malaysia.

**Keywords:** biospheric-altruistic values, environmental attitude, green purchase attitude, green purchase behaviour, Malaysia

## 1. Introduction

In Malaysia, the government actively promotes sustainable development to ensure balanced development between economic growth and environmental sustainability. Several laws, regulations, incentive schemes, and environmental programs, such as environment-friendly technology, clean production, pollution prevention, the Environmental Management System, and the ISO 14000 series certification, for environmental management purposes were established. Most of the firms have started to incorporate the environmental issues in their business models and begun to develop green products to meet the demand of environmentally conscious consumers. However, the number of green product buyers and the motivations to purchase green products are still under-explored in Malaysia.

Given the limited information from the demand side, firms are having difficulty in assessing the feasibility of entering or expanding their operations in the green market. There is a high need for firms to understand the important factors that drive the consumers to purchase green products which certainly helps to provide a useful insight in better formulating and implementing marketing strategy to go green. Values are often regarded when studying environmental attitude and behaviour (Kim, 2011; 2002; de Groot & Steg, 2008; 2007). Past studies have suggested that it is valid to consider biospheric values independently from altruistic values in research (Schuitema & de Groot, 2015; de Groot et al., 2012). However, the distinction between these two values is still debating and inconclusive. Therefore, this paper aims to address three research objectives: (1) to determine the dimension(s) of environmental values from the combination of biospheric and altruistic values; (2) to investigate the prominent predictor(s) of green purchase behaviour; and (3) to examine the influence of environmental values on green purchase behaviour through environmental attitude only, green purchase attitude only, or a combination of both from Malaysian consumers' perspectives. A framework of green purchase behaviour extended from the Value-Attitude-Behaviour model (Homer & Khale, 1988) is proposed in this paper.

## 2. Literature Review

In this section, several underpinning theories and relevant empirical studies which help to develop the main idea and research framework proposed in this paper are discussed.

## 2.1 Value Orientation

Schwartz (1992) defined value as a desirable transsituational goal varying in importance, which serves as a guiding principle in the life of a person or other social entity. Several conceptualisations of value theories have been used in previous environmental behavioural studies such as the List of Values (Kahle, 1983), Schwartz Value Theory (Schwartz, 1992), and the shorter value orientation items derived from Schwartz Value Theory (Stern et al., 1998; 1995; 1993).

### 2.1.1 List of Values (LOV)

Kahle (1983) proposed the List of Values (LOV) which consists of nine items, namely, excitement, fun and enjoyment of life, warm relationships with others, self-fulfilment, being well-respected, sense of belonging, sense of accomplishment, security, and self-respect. These nine items have been grouped into external and internal values (Kahle, 1983), and external, internal, and interpersonal values (Homer & Kahle, 1988). The scale has been applied in several empirical behavioral studies such as in the context of natural food shopping (Homer & Kahle, 1988), mall shopping (Shim & Eastlick, 1998), e-shopping (Jayawardhena, 2004), milk product purchase (Humayan & Hasnu, 2009), recycling (McCarty & Shrum, 2001; 1994), organic food purchase (Chrysohidis & Krystallis, 2005), and environmental behaviour (Nagy et al., 2012). However, Hansen (2008) commented that LOV places too much emphasis on general consumer life.

### 2.1.2 Schwartz Value Theory (SVT)

Schwartz Value Theory (Schwartz, 1992) is the most commonly theory employed in recent environmental studies (Harring & Jagers, 2013; Saris et al., 2013; de Groot & Steg, 2008; 2007). Schwartz presented 10 different types of values and grouped them into four separate dimensions (self-enhancement, self-transcendence, openness to change, and tradition values) or two conflicting dimension spaces (self-enhancement versus self-transcendence values, and openness to change versus tradition values). Self-enhancement values emphasise on self-interest, such as power and achievement values, and self-transcendence values focus on the welfare and interests of others, such as universalism and benevolence values. Openness to change values emphasise independent actions, thoughts, and feelings as well as the readiness for new experiences and consist of self-direction, hedonism, and stimulation values. Conversely, tradition values focus on self-restriction, order, and resistance to change and include the values of security, conformity, and tradition (Schwartz, 1994; 1992). However, researchers claimed that the value instrument with 66 items is too lengthy and time consuming to be used in surveys (de Groot & Steg, 2008; 2007; Stern et al., 1993).

### 2.1.3 Egoistic, Altruistic, and Biospheric Values

In 1993, Stern and colleagues reduced the number of value instruments in SVT and suggested three types of value orientations to predict environmental attitude and behaviour. These three are (a) egoistic values, (b) altruistic values, and (c) biospheric values. An individual with an egoistic value focuses on his/her self and self-oriented goals, such as health, quality of life, prosperity, and convenience. This value appears indistinguishable from the self-enhancement value proposed in SVT. Individuals with an altruistic value focus on other people or human elements, such as children, families, the community, and humanity. This value appears to correspond closely to the self-transcendence value clustered in SVT. Individuals with a biospheric value emphasise on the well-being of living things or non-human elements, which can include plants, animals, and trees. Stern et al. (1995) then developed biospheric–altruistic values by combining biospheric and social-altruistic values. They reported that biospheric value is the strongest predictor of environmental attitude. In addition, Deng et al. (2006) named altruistic and biospheric values as environmental values. They examined the similarities and differences of these two values in Chinese in Canada and Anglo-Canadians.

### 2.1.4 Environmental Values: Can Biospheric and Altruistic Values Be Distinguished?

There were two groups of results reported from the past studies concerning the dimensionality of environmental values. First, researchers examined whether value orientations can be distinguished separately (altruistic and biospheric values) and concluded that both value orientations can be distinguished into two dimensions (Schuitema & de Groot, 2015; Lopez-Mosquera Sanchez, 2012; de Groot et al., 2012; Steg et al., 2011; de Groot & Steg 2008, 2007; Deng et al., 2006; Steg et al., 2005). Second, the researchers did not observe an independent distinction between altruistic and biospheric values (Kim, 2011; 2002; Milfont, 2007; Kim & Choi, 2005; 2003; Dietz et al., 2002; McCarty & Shrum, 2001; 1994; Grunert & Juhl, 1995). Only cultural values and Schwartz value items were addressed in the second group of studies.

## 2.2 General Attitude: Environmental Attitude

Environmental attitude is a popular construct that has been extensively discussed and published in many

environmental psychology studies (Milfont et al., 2010). Milfont (2007, p. 12) defined environmental attitude as the “psychological tendency that is expressed by evaluating perceptions of or beliefs regarding the natural environment, including factors affecting its quality, with some degree of favour or disfavour.” It is the sum of beliefs, affects, and behavioural intention an individual has about environmental activities (Schultz et al., 2004) and usually deals with the factors that affect its quality (Gallagher, 2004). Cherian and Jacob (2012) and Lee (2008) defined environmental attitudes in a similar manner, namely, all environmental attitudes are related to the cognitive judgment of an individual to protect and promote the environment. Several researchers adopted the terms “environmental attitudes” and “environmental concern” in a similar manner to measure the environment as a whole (Dunlap & Jones, 2002). However, a number of scholars emphasised the differences between these two terms (Sinnappan & Abd Rahman, 2011; Wahid et al., 2011; Lee, 2008; Mostafa, 2007).

### 2.3 Specific Attitude: Green Purchase Attitude

Hines et al. (1987) identified two types of attitudes related to the environmental behavioural studies: attitudes towards the environment as a whole and attitudes towards undertaking a specific types of environmental behaviour, such as recycling, conserving water and energy, and green purchase behaviour. For specific types of attitudes towards undertaking a specific type of environmental behaviour, “importance” and “inconvenience” are the most common attitudinal variables (Laroche et al., 2001). Several studies have investigated the effect of attitude towards the “importance of recycling” and “inconvenience of recycling” on recycling behaviour (McCarty & Shrum, 2001; 1994). Whereas, in the context of green purchases, customers will be more interested in purchasing and paying more for green products if they hold positive attitudes towards the “importance” of being environmentally friendly and find engaging in environmentally friendly behaviour is “convenient” (Cheah & Phau, 2011; Ng, 2009; Majláth, 2008; Tsen et al., 2006; Laroche et al., 2001). On the other hand, several researchers (e.g., Ali et al., 2011; Mostafa, 2007; Chan, 2001; Chan & Lau, 2000) investigated green purchase attitude in general, and revealed its positive influences on green purchase intention and behaviour.

### 2.4 Green Purchase Behaviour

Green purchase behaviour is a type of pro-environmental behaviour (Durif et al., 2012; Wahid et al., 2011; Kim, 2011; 2002; Mostafa, 2007; Kim & Choi, 2005; 2003). It refers to the behaviour of purchasing products that have least impact on the environment (Mainieri et al., 1997). Chan (2001) defined green purchase behaviour as a type of environmentally friendly behaviour that allows customers to show their concern for the environment. In addition, it is related to any action of consuming products that can be conserved, bring benefit to the environment, and demonstrate positive attitudes towards the environment (Lee, 2008). In this study, the meaning of green purchase behaviour mainly refer to the action taken by the consumers to purchase green products offered in the market.

### 2.5 Value-Attitude-Behaviour Model (VAB)

Homer and Kahle (1988) presented a cognitive hierarchy model called Value-Attitude-Behaviour (VAB) model (Figure 1). This model implies a hierarchy of cognitions in which “the influence should theoretically flow from more abstract values to mid-range attitudes and specific behaviours” (p. 683). Values are conceptualised as determinants of attitudes, and attitudes in turn lead to specific decision-making behaviour. Homer and Kahle (1988) investigated the relationships among value, attitude, and behaviour in a specific context, which was shopping behaviour towards natural food. They discovered that values have an indirect effect on shopping behaviour with attitudes towards natural food acting as a mediator. They concluded that “values have distinct dimensions that are important in the formation and development of attitudinal and behavioural tendencies” (p.645) and suggested that the causal effects among VAB should also be tested in other products or in other industrial context.

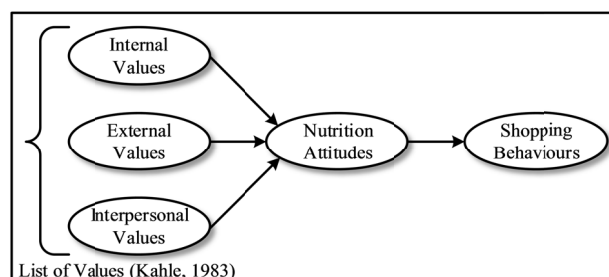


Figure 1. Theoretical framework of value-attitude-behaviour model (Homer & Kahle, 1988)

The VAB relationship has been investigated in several studies. For instance, Jayawardhena (2004) indicated that values such as self-direction, enjoyment, and self-achievement values have a significant and positive effect on attitudes towards e-shopping and subsequently result in e-shopping behaviour. In this study, attitude functions as a mediating variable between personal values and behaviour. Watchravesringkan and Yurchisin (2007) also reported that values affect an individual's perception of the positive and negative roles of price; in turn, the perception of the positive and negative roles of price affects the ongoing search behaviour. Other similar studies empirically tested food shopping behaviour (Goldsmith et al., 1997), mall shopping behaviour (Shim & Eastlick, 1998), retail career choice behaviour (Shim et al., 1999), and consumers' willingness to buy groceries online (Hansen, 2008).

In the context of environmental studies, Grunert and Juhl (1995) confirmed the explanatory power of values for environmental attitudes and reported a positive relationship between environmental attitudes and purchase of organic food. Besides, McCarty and Shrum (2001; 1994) demonstrated the presence of the VAB hierarchy regarding recycling in an American setting. In both studies, values did not affect behaviour. Two cultural values (i.e., collectivism and individualism values) were reported to have direct effects on attitude towards the importance of recycling and attitude towards the inconvenience of recycling. Both attitudinal variables mediate the relationship between values and behaviour. However, both studies did not include biospheric and altruistic value orientations as well as environmental attitudes as predictors of recycling behaviour.

Kim (2002) employed the VAB model in a causal approach to analyse the effect of values and environmental attitudes on pro-environmental behaviour in two national groups (United States and Korea). In Kim's study, Schwartz's value theory with 22 items was employed to measure the value dimensions. Kim and Choi (2005; 2003) and Kim (2011) reported consistent findings that support the mediating roles of attitudinal variables between values and behaviour in a causal approach among Korean consumers in the green purchase behaviour context. Similarly, the dimensionality of altruistic and biospheric values was not distinguished in these studies.

#### 2.5.1 Value Linked to Attitude

Altruistic and biospheric values have been reported to have two independent dimensions (Schuitema & de Groot, 2015; Lopez-Mosquera & Sanchez, 2012; Steg et al., 2011; Lopez & Cuervo-Arango, 2008; de Groot & Steg, 2008, 2007; Deng et al., 2006; Steg et al., 2005). Several researchers have further investigated the effects of altruistic and biospheric values, together with egoistic values, to explain environmental attitude (NEP scale) in their studies. For example, Steg et al. (2005) in Netherlands, Deng et al. (2006) in Canada, and de Groot and Steg (2007) in the United States demonstrated that biospheric values are positively related to environmental attitude, whereas altruistic values are not related to environmental attitude. Meanwhile, egoistic values are negatively related to environmental attitude (e.g., de Groot & Steg, 2007; Steg et al., 2005) but not significantly related to environmental attitude (e.g., Lopez-Mosquera & Sanchez 2012). However, egoistic values were not tested in the study of Deng et al. (2006). Generally, the effect of biospheric values on environmental attitude is relatively stronger than that of altruistic values because environmental behaviour are usually delivered more benefits to the biosphere than to people (Lopez-Mosquera & Sanchez, 2012; de Groot & Steg, 2008, 2007; Steg et al., 2005). Thus, it is vital to consider biospheric values separately from altruistic values in environment-related studies (de Groot et al., 2012).

#### 2.5.2 Value Linked to Behaviour

Several environmental-behavioural studies reported that environmental behaviours are related to certain values either positively or negatively (Harring & Jagers, 2013; Ramayah et al., 2010; de Groot & Steg, 2007; Aoyagi-Usui, 2001; Laroche et al., 2001; Stern et al., 1999; Stern et al., 1993). For instance, a recent study conducted by Harring and Jagers (2013) in Sweden reported that egoistic values are negatively related to the support for pro-environmental taxes, whereas altruistic values are positively related to such behaviour. This finding is consistent with the finding reported by Lopez and Cuervo-Arango (2003) pertaining to general environmental behaviour. De Groot and Steg (2007) reported that egoistic values are not related to environmental behaviour, whereas both biospheric and altruistic values are positively related to donating intention. In Japan, Aoyagi-Usui (2001) reported that altruistic and biospheric-tradition values are both related to recycling behaviour and green purchase behaviour. Lastly, in Malaysia, Tsen et al. (2006) revealed that individuals with collectivism values are willing to pay more to purchase green products, and Ramayah et al. (2010) demonstrated that self-enhancement values are negatively related to purchase intention towards buying cloth diapers.

#### 2.5.3 Attitude Linked to Behaviour

Previous studies have revealed that environmental attitude is the direct predictor of general environmental

behaviour (Lopez & Cuervo-Arango, 2008; Majláth, 2008; Milfont, 2007; Meinhold & Malkus, 2005; Kim, 2002). In terms of purchasing decisions towards green products, many studies report that environmentally conscious consumers transform their general environmental attitudes to green purchase behaviour (Sinnappan & Abd Rahman, 2011; Wahid et al., 2011; Kim, 2011; 2002; Lee, 2008; Tilikidou, 2007; Kim & Choi, 2005; 2003; Aoyagi-Usui, 2001), and to the willingness to spend more money for the purchase of green products or services that are being offered in the market (Jang et al., 2011; Hu et al., 2010; Tsen et al., 2006; Laroche et al., 2001).

However, several researchers commented that a gap exists between attitude and behaviour; many researchers reported that consumer concern for the environment must have been over estimated because it is not always translated into actual green purchase behaviour (Muhmin, 2007; Gupta & Ogden, 2006; Peattie, 2001; Maineiri et al., 1997). Environmentally conscious consumers do not necessarily observe pro-environmental behaviour (Ohtomo & Hirose, 2007). In contrast, certain researchers report that the share from green market activities is still insignificant (Peattie, 2001). Bamberg (2003, p. 25) addressed that “only situation-specific cognitions are direct determinants of specific behaviour, future research should no longer view environmental concern as a direct, but as an important indirect determinant of specific behaviour”. He argued that general attitudes, like environmental attitudes, should not be assumed as direct determinants of specific environmental behaviour. Sun and Wilson (2008) suggested that general and specific attitudes should be studied simultaneously rather than separately in an empirical research. Therefore, researchers must investigate the relationship between general and specific attitudes as well as the mediating roles of attitudinal variables in the relationship between values and environmental behaviour (Kim, 2011; 2002; Kim & Choi, 2005; 2003; McFarlane & Boxall, 2003; Thøgersen & Olander, 2002; McCarty & Shrum, 2001; 1994).

## 2.6 Research Framework and Hypothesis Development

Based on the previously cited theoretical and empirical literatures, Figure 2 shows a proposed research model used to examine the influence of environmental values on green purchase behaviour directly and indirectly.

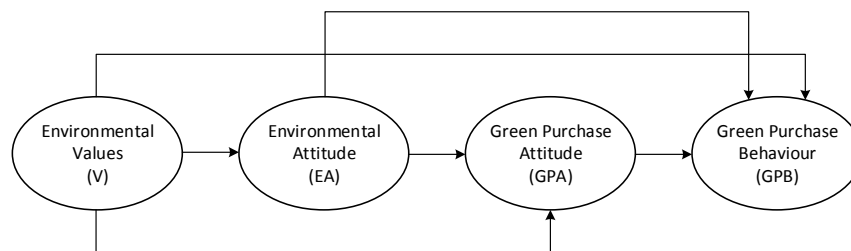


Figure 2. A proposed framework of green purchase behaviour

Note. V= Environmental Values, EA= Environmental Attitude, GPA= Green Purchase Attitude, GPB= Green Purchase Behaviour.

Hence, 6 hypotheses were developed to achieve the research objectives. H1, H2, and H3 were developed to determine the prominent predictor of green purchase behaviour. The hypotheses are developed as follows:

- H1:** Environmental values directly influence green purchase behaviour. ( $V \rightarrow GPB$ )
- H2:** Environmental attitude directly influences green purchase behaviour. ( $EA \rightarrow GPB$ )
- H3:** Green purchase attitude directly influences green purchase behaviour. ( $GPA \rightarrow GPB$ )

Then, to test the influence of environmental values on green purchase behaviour through environmental attitude only, green purchase attitude only, or a combination of both as addressed in research objectives 3, three hypotheses have been developed (H4- H6). H4 and H5 test two-path mediated effect that involves a single mediator (i.e., environmental attitude and green purchase attitude respectively), and H6 tests three-path mediated effect which take account of two mediators (i.e., environmental attitude and green purchase attitude) between environmental values and green purchase behaviour. Therefore, the following hypotheses are examined:

- H4:** Environmental values indirectly influence green purchase behaviour through environmental attitude. ( $V \rightarrow EA \rightarrow GPB$ )
- H5:** Environmental values indirectly influence green purchase behaviour through green purchase attitude. ( $V \rightarrow GPA \rightarrow GPB$ )
- H6:** Environmental values indirectly influence green purchase behaviour through environmental

*attitude and green purchase attitude. (V→EA→GPA→GPB)*

### 3. Research Methodology

#### 3.1 Measures

In order to obtain reliable information from the respondents, established and validated scale was selected for data collection. A brief version of Schwartz's value scale from the self-transcendence cluster (8 items) developed by de Groot and Steg (2008, 2007) was adopted in this study to measure environmental values (i.e., biospheric and altruistic values). A revised NEP scale with 15 items (Dunlap et al., 2000) was used to measure the environmental attitude. Besides, four items indicate the importance and inconvenience of green purchases (e.g., Ng, 2009; Majláth, 2008; Tsen et al., 2006; Cheah & Phau, 2006) plus extra three items from the previous researchers (e.g., Ali et al., 2011; Mostafa, 2007; Chan, 2001; Chan & Lau, 2000) were adapted to measure green purchase attitude in this study. The items used to measure green purchase behaviour were adapted from the previous studies (e.g., Kim, 2011; 2002; Sinnappan & Abd Rahman, 2011; Lee, 2008; Tilikidou, 2007; Kim & Choi, 2005; 2003; Lee, 2008). All items were measured based on 7-point likert scale.

#### 3.2 Data Collection and Sample Profile

Through the pilot study conducted with 50 respondents, a positive feedback on the structure and delivery of the questionnaire was obtained. The data from the pilot study were analysed for reliability through SPSS and showed a moderate coefficient alpha above 0.70 for each construct. Then, the final questionnaires were administered to 600 respondents in Klang Valley Malaysia; via convenience sampling method which was consistent with that employed in previous studies related to green purchase behaviour (e.g., Aman et al., 2012; Kim, 2011; Sinnappan & Abd Rahman, 2011; Ali et al., 2011; Kim & Choi, 2005; 2003; Kim, 2002). After removing missing data and outliers, the sample was found to be adequate (i.e., 500 respondents, an 83.33% response rate). Among the analysed sample (N = 500), 56.6% of the respondents were female, 38% were aged between 26 and 35 years, 54.4% had a bachelor's degree, and 39.2% earned a monthly income of RM 3501 to RM 5000. In terms of occupational level, a majority were executives (33.8%) and students (31.2%).

### 4. Results

This section provides the results of each analysis to achieve the research objectives of this study.

#### 4.1 Exploratory Factor Analysis (EFA)

Via Exploratory Factor Analysis (EFA), several items were removed from the constructs of environmental attitude (EA1, EA2, EA4, EA8, EA10, EA11, EA12, and EA14), green purchase attitude (GPA7), and green purchase behaviour (GPB1 and GPB2) because of the low values of communalities (<0.50) and poor loadings (<0.50). The Kaiser-Meyer-Olkin (KMO) measures of sampling adequacy for all constructs were above 0.80 (>0.50). The factor loadings of 0.70 and higher for all the construct items are considered significant for interpretative purposes (Hair et al., 2010). Finally, the Cronbach's alpha values reported for all constructs were greater than 0.80 (>0.60), indicating the high internal consistency of items for all the research constructs (Hair et al., 2010).

#### 4.2 Assessment of Measurement Model

A two-step model-building approach (Anderson & Gerbing, 1988) was applied to test the measurement model (relationships between observed items and latent constructs) before the hypothesised linkages on the structural model (relationships between latent constructs) was examined. In contrast to EFA, Confirmatory Factor Analysis (CFA) is a confirmatory technique driven by theory (Schreiber et al., 2006). In terms of the estimation method, most researchers (e.g., Hair et al., 2010; Kline, 2010) have recommended maximum likelihood (ML), a common method and a default method in SEM programs. The adequacy of the four-factor measurement model (V; EA; GPA; GPB) was evaluated by examining its goodness-of-fit indices, its reliability, and the convergent and discriminant validity of the construct. The results of the CFA were shown in Table 1. The overall goodness-of-fit indices showed that the four-factor model had an acceptable fit with the data (CMIN/df= 1.383, GFI=0.926, RMSEA= 0.028, NFI= 0.943, CFI= 0.984, and TLI= 0.982). All items were significantly loaded above 0.50 on their specified latent construct ( $p < 0.01$ ). The construct reliabilities for V= 0.85, EA= 0.82, GPA= 0.66, and GPB = 0.82 respectively. These values exceeded the recommend threshold suggested by Bagozzi and Yi (1988), indicating the internal consistency of items for each construct. Then, a variance extracted test was employed to examine convergent and discriminant validity. The results showed that all average variance extracted (AVE) values (i.e., V= 0.69, EA= 0.53, GPA= 0.53, GPB= 0.72) were above the suggested cutoff of 0.50 (Fornell & Larcker, 1981) and the values were greater than the square of the correlation between any pair of factors. These findings confirmed convergent and discriminant validity

Table 1. Correlations and squared correlations among study constructs and AVE (Correlations among study constructs (squared))

Measure	V	EA	GPA	GPB	AVE
V	1.000				0.69
EA	0.57 (0.33)	1.000			0.53
GPA	0.15 (0.02)	0.31 (0.10)	1.000		0.53
GPB	0.08 (0.001)	0.21 (0.05)	0.28 (0.08)	1.000	0.72
Construct reliability	0.85	0.82	0.66	0.82	
Mean	5.392	5.177	4.996	4.513	

Model measurement fit: CMIN/df=1.383;  $p < 0.001$ ; GFI=0.926; RMSEA=0.028; NFI=0.943; CFI=0.984; TLI= 0.982.

#### 4.3 Assessment of Structural Model

As a next step, SEM was tested. The results of ML estimation suggested that the structural model fit to the data well (CMIN/df=1.634, GFI=0.905, RMSEA=0.036, NFI=0.934, CFI=0.973, and TLI=0.971). No further modification or improvement was required. All of the links were significant and positive, except the links between V→GPA and V→GPB. As shown in Table 2, the unidimensional structure of environmental values (i.e., biospheric-altruistic values) had a positive significant effect on environmental attitude ( $\beta = 0.58$ ,  $t = 10.73$ ,  $p < 0.001$ ) but did not influence green purchase attitude ( $\beta = -0.06$ ,  $t = -0.92$ ,  $p > 0.05$ ) and green purchase behaviour ( $\beta = -0.07$ ,  $t = -1.16$ ,  $p > 0.05$ ). By contrast, environmental attitude ( $\beta = 0.20$ ,  $t = 3.06$ ,  $p < 0.01$ ) and green purchase attitude ( $\beta = 0.23$ ,  $t = 4.23$ ,  $p < 0.001$ ) had positive significant effects on green purchase behaviour. The effect of green purchase attitude ( $\beta = 0.23$ ) on green purchase behaviour was slightly stronger than that of environmental attitude ( $\beta = 0.20$ ).

Table 2. Parameter estimates, standard error, critical ratio, and p-value of structural paths

Structure Path	Standard error	Critical ratio (t-value)	p-value	Standardised parameter estimates
V→EA	0.05	10.73	***	0.58
V→GPA	0.06	-0.92	ns	-0.06
EA→GPA	0.07	5.18	**	0.36
V→GPB	0.08	-1.16	ns	-0.07
EA→GPB	0.10	3.06	***	0.20
GPA→GPB	0.08	4.23	***	0.23

Note. ns means not significant, \*\*( $P < 0.01$ ), \*\*\*( $P < 0.001$ ).

#### 4.4 Results of Objective 1: Dimensions of Environmental Values

In this study, only one component is extracted for the environmental values (8 items) with total variance explained at 73.27% and an alpha value of 0.94 via EFA. Via CFA, the MI of the environmental value scale indicated that V2 and V3 should be removed and that one error covariance path was added between V1 and V8. After the original measurement model of the environmental value construct has been improved, 6 items of this construct were retained for further analysis. Next, the unidimensional measure of the construct is further confirmed via CFA with a CFI of 0.99 ( $> 0.90$ ) for the analysed model, indicating no violation of unidimensionality (Teh, 2010; Sureshchandar et al., 2001). Hence, the results of this study clearly indicate that both biospheric and altruistic values cannot be distinguished empirically in the Malaysian context. Thus, this construct is recommended as a unidimensional structure and is named as environmental values (i.e., biospheric-altruistic values). The respondents view both dimensions of biospheric and altruistic values under the same cluster of environmental values to guide them in focusing on the well-being and interest of others (i.e., human and non-human elements).

#### 4.5 Hypothesis Testing

The results of the six hypotheses tested were reported in this section.

##### 4.5.1 Results of Objective 2: Predictors of Green Purchase Behaviour

**Hypothesis 1 [H1]:** Environmental values directly influence green purchase behaviour (V→GPB).

As indicated by the structural coefficients and associated significance levels in Table 3, the influence of

environmental values (i.e., biospheric–altruistic values,  $\beta = -0.07$ ) on green purchase behaviour was not significant at the 0.05 level ( $V \rightarrow GPB$ ). Thus, H1 is not supported. Although numerous environmental behavioural studies have reported that environmental behaviours are either positively or negatively related to certain values, the unidimensional structure of the environmental values (i.e., biospheric–altruistic values) reported in this study only indirectly influenced green purchase behaviour. This result implies that holding strong environmental values as a guiding principle in life is not sufficient to lead to green purchase behaviour of an individual, if without the intervening variable between the relationship.

**Hypothesis 2 [H2]:** *Environmental attitude directly influences green purchase behaviour (EA→GPB).*

Table 3 shows that environmental attitude ( $\beta = 0.20$ ,  $p < 0.01$ ) was positively and significantly related to green purchase behaviour (EA→GPB), thus supporting hypothesis H2. This result indicated that general environmental attitude was the significant predictors of green purchase behaviour. In terms of decisions on purchasing green products, the commitment of buyers was often based on their environmental attitudes.

**Hypothesis 3 [H3]:** *Green purchase attitude directly influences green purchase behaviour (GPA→GPB).*

As indicated in Table 3, hypothesis H3 was supported because green purchase attitude ( $\beta = 0.23$ ,  $p < 0.001$ ) had a significant and positive direct effect on green purchase behaviour (GPA→GPB). Hence, it is apparent that when the consumers like the ideas of green purchases, believe that it is important to purchase green products to save the natural environment, and find it convenient to purchase, then this favorable attitudes will be translated to the action to purchase green products offered in the market. The link between green purchase attitude and behaviour ( $\beta = 0.23$ ) was stronger than the path linking environmental attitude and green purchase behaviour ( $\beta = 0.20$ ). It means that both attitudinal variables are the prominent predictors of green purchase behaviour, but the specific green purchase attitude can serve as a better and closer predictor as compared to the general environmental attitude. Therefore, specific behaviour should be predicted with a specific attitudinal variable to gauge a closer association between these two variables.

Table 3. Results of hypotheses testing (H1, H2, H3)

Hypotheses	Structure Path	t-value	p-value	Standardized coefficient ( $\beta$ )	Results
H1	$V \rightarrow GPB$	-1.16	ns	-0.07	Not supported
H2	$EA \rightarrow GPB$	3.06	***	0.20	Supported
H3	$GPA \rightarrow GPB$	4.23	***	0.23	Supported

Note. ns means not significant, \*\*( $P < 0.01$ ), \*\*\*( $P < 0.001$ ).

#### 4.5.2 Results of Objective 3: Influence of Environmental Values on Green Purchase Behaviour (Indirect Effect)

To examine the influence of environmental values on green purchase behaviour through environmental attitude only (i.e., H4), green purchase attitude only (i.e., H5), or a combination (i.e., H6), both two-path and three-path mediated effects were tested. Three-path mediated effects referred to the effect passing through both mediators (i.e., environmental attitude and green purchase attitude), while two-path mediated effects channeled the attention to the effect passing through only one of the mediators (i.e., environmental attitude or green purchase attitude). To assess the mediated effects of both general and specific environment-related attitudinal variables among environmental values and green purchase behaviour, the “joint significance test” suggested by MacKinnon et al. (2002) was used. According to MacKinnon et al. (2002) and Taylor et al. (2008), two criteria support the presence of a mediating effect in a single-mediator model. The first criterion is that the independent variable must be significantly related to the mediating variable. The second criterion is that the mediating variable must be significantly related to the dependent variable. These two criteria can be generalised into a three-path mediational model (Taylor et al., 2008). In this model, the joint significant test confirmed a mediation effect when the three paths of the mediated effect in the model were significant and non-zero (Taylor et al., 2008).

**Hypothesis 4 [H4]:** *Environmental values indirectly influence green purchase behaviour through environmental attitude ( $V \rightarrow EA \rightarrow GPB$ ).*

The results of the joint significance method (Mackinnon et al., 2002; Taylor et al., 2008) (Table 4) indicated that environmental attitude mediated the relationship between environmental values (i.e., biospheric–altruistic values) and green purchase behaviour. This result was demonstrated by the indirect effect with a path coefficient of  $\beta = 0.12$ , which was significant at  $p < 0.001$  compared with the direct effect with a path coefficient of  $\beta = -0.07$ , which was not significant. The result also indicates the total effect with a path coefficient of  $\beta = 0.05$  ( $p < 0.001$ ), which



was greater than the direct effect of  $\beta = -0.07$  with a non-significance level. Therefore, H4 was supported ( $V \rightarrow EA \rightarrow GPB$ ). This finding indicates that consumers with strong environmental values in life will purchase green products if they have a favorable attitude towards the environment.

**Hypothesis 5 [H5]:** *Environmental values indirectly influence green purchase behaviour through green purchase attitude ( $V \rightarrow GPA \rightarrow GPB$ ).*

As shown in Table 4, the specific green purchase attitude did not mediate relationship between environmental values (i.e., biospheric–altruistic values) and green purchase behaviour with evidence of an indirect effect with a path coefficient of  $\beta = -0.01$  ( $p > 0.05$ ) and a total effect of  $\beta = -0.08$  ( $p > 0.05$ ). Although green purchase attitude ( $\beta = 0.23$ ,  $p < 0.001$ ) has significant and positive influence on green purchase behaviour ( $GPA \rightarrow GPB$ ), environmental values did not influence this specific attitudinal variable ( $V \rightarrow GPA$ ). To meet the criterion suggested in the joint significant test, both tested paths should be significantly related. However, the independent variable (i.e., environmental values) was not significantly related to the mediating variable (i.e., green purchase attitude), although the mediating variable (green purchase attitude) was related to the dependent variable (i.e., green purchase behaviour) at the significant level. Therefore, the mediating effect of specific green purchase attitude did not exist because environmental values did not influence green purchase attitude ( $\beta = -0.07$ ,  $p > 0.05$ ). Therefore, H5 was not supported ( $V \rightarrow GPA \rightarrow GPB$ ). The result of this finding concluded that GPA serves as a prominent predictor of GPB, but not acting as a mediator to mediate the relationship between environmental values and green purchase behaviour.

**Hypothesis 6 [H6]:** *Environmental values indirect influence green purchase behaviour through environmental attitude and green purchase attitude ( $V \rightarrow EA \rightarrow GPA \rightarrow GPB$ ).*

H6 tested the influence of environmental values (i.e., biospheric–altruistic values) on green purchase behaviour through both mediators (environmental attitude and green purchase attitude). As presented in Table 4, environmental attitude and green purchase attitude together had a significant mediating role in the relationship between environmental values and green purchase behaviour with evidence of an indirect effect with a coefficient of  $\beta = 0.05$  ( $p < 0.001$ ) compared with a direct effect with a path coefficient of  $\beta = -0.07$  ( $p > 0.05$ ) at a non-significant level. The mediated effect can be demonstrated by the significant paths from  $V \rightarrow EA$ ,  $EA \rightarrow GPA$ , and  $GPA \rightarrow GPB$  with coefficient values of 0.58, 0.36, and 0.23 ( $p < 0.001$ ), respectively. Therefore, the results were aligned with the joint significant test of Taylor et al. (2008) applied in the three-path mediational model to confirm a mediation effect when the three paths of the mediated effect in the model were significant and non-zero. Therefore, H6 was supported ( $V \rightarrow EA \rightarrow GPA \rightarrow GPB$ ). Besides, the indirect effect of  $V \rightarrow EA \rightarrow GPB$  discussed in H4 ( $\beta = 0.12$ ,  $p < 0.001$ ) was stronger than that of  $V \rightarrow EA \rightarrow GPA \rightarrow GPB$  presented in H6 ( $\beta = 0.05$ ,  $p < 0.001$ ). The results concluded that environmental values indirectly influence green purchase behaviour through environmental attitude as well as via a combination of environmental attitude and green purchase attitude. Both two-path and three-path mediating effects exist in the context of green purchase behaviour in Malaysia.

Table 4. Results of hypotheses testing (H4, H5, H6)

	Direct effect	Indirect effect (through EA) $V \rightarrow EA \rightarrow GPB$ (H4)	Indirect effect (through GPA) $V \rightarrow GPA \rightarrow GPB$ (H5)	Indirect effect (through EA&GPA) $V \rightarrow EA \rightarrow GPA \rightarrow GPB$ (H6)
Environmental Values (V)	-0.07 (ns)	0.58 x 0.20=0.12 (***)	-0.06 x 0.23=-0.01 (ns)	0.58 x 0.36 x 0.23= 0.05 (***)
Results		Supported	Not supported	Supported

A final framework of green purchase behaviour is presented in Figure 3, with all the significant coefficient paths indicate between the variables. Two structural links are found between environmental values and green purchase behaviour: (1)  $V \rightarrow EA \rightarrow GPB$ , and (2)  $V \rightarrow EA \rightarrow GPA \rightarrow GPB$ . The framework shown that environmental values influenced green purchase behaviour indirectly; its direct influence on such behaviour was not found.

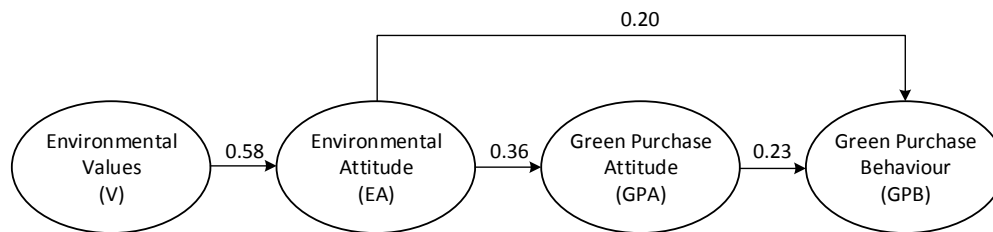


Figure 3. A final framework of green purchase behaviour

## 5. Discussion

In this study, the unidimensional structure of environmental values from the combination of biospheric and altruistic values does not directly influence green purchase behaviour. Environmental values do not predict green purchase behaviour. No direct relationship between values and behaviour is found in instances when mediating constructs are not explored (Kim, 2011, 2002; Kim & Choi, 2005, 2003). Thus, this finding further confirms that the common practice of relying on the direct effects of value orientations to predict a specific environment-related behaviour may be inappropriate because it may overlook the importance of indirect effects in the relationship. Therefore, it is important to find out the intervening variable(s) which link those who are high in environmental values to engage in green purchases. Besides, the segregation of biospheric and altruistic values into two dimensions among Malaysian consumers is not required because these two values belong to the same construct of environmental values.

Surprisingly, the results of this study indicate that environmental attitude is an important predictor of green purchase behaviour. These findings are consistent with past findings, which show that environmentally conscious consumers translate their environmental attitude to green purchase behaviour (Sinnappan & Abd Rahman, 2011; Kim, 2011, 2002; Wahid et al., 2011; Lee, 2008; Tilikidou, 2007; Kim & Choi, 2005, 2003; Aoyagi-Usui, 2001). This finding contradicts Bamberg (2003), Hines et al. (1987), Weigel and Newman (1976), and Fishbein and Ajzen (1975), who rejected the use of a general attitude to measure a specific behaviour. A general attitude, such as environmental attitude, is a direct determinant of green purchase behaviour reported in this study.

Next, Fishbein and Ajzen (1975) warned against the use of general attitudes to predict specific behaviour. A specific behaviour should be studied with a specific attitudinal measure to obtain a close association between the attitude and behaviour (Bamberg, 2003; McCarty & Shrum 2001; 1994). In line with previous findings, the results indicate that green purchase attitude is a stronger predictor of green purchase behaviour, compared with the path between environmental attitude and green purchase behaviour. Specific attitude towards green purchases is a stronger predictor to predict green purchase behaviour than general environmental attitudes. Overall, the findings confirm that green purchase attitude is the most important predictor, followed by environmental attitude, in leading customer behaviour to green product purchases in the market. Hence, the best way to encourage customers to purchase green products is to improve their attitudes towards green purchases, followed by increasing the level of their environmental consciousness. Marketers should first enhance customers' attitudes towards green purchases by highlighting the ideas of purchasing green products, as well as the importance and convenience of their green purchase behaviour, and then increase their awareness of the seriousness of environmental deterioration.

With the joined significance method (Taylor et al., 2008; Mackinnon et al., 2002), the results indicate that environmental values indirectly influence green purchase behaviour through a single mediator (i.e., environmental attitude), and through both mediators (i.e., environmental attitude and green purchase attitude), as presented in the causal link of  $V \rightarrow EA \rightarrow GPA \rightarrow GPB$ . These findings are consistent with previous studies that highlight the mediating roles of attitudinal variables to link value orientation to behaviour both in non-environmental (Hansen, 2008; Jayawardhena, 2007; Watchravesringkan & Yurchisin, 2004) and environmental behavioural studies (Kim, 2011; Milfont, 2007; Kim & Choi, 2005; Schultz et al., 2004; McFarlane & Boxall, 2003).

One significant interesting finding derived from the context of green purchase behaviour is that the indirect effect of one mediator (two-path mediated effect, i.e.,  $V \rightarrow EA \rightarrow GPB$ ) is stronger than that of two mediators (three-path mediated effect, i.e.,  $V \rightarrow EA \rightarrow GPA \rightarrow GPB$ ) between environmental values and green purchase behaviour. This shown that environmental attitude have both direct and indirect effects on green purchase behaviour through green purchase attitude. Thus, a favorable environmental attitude is a necessary condition that

contributes to green purchase behaviour, and environmental attitude is also a requirement state to derive a positive green purchase attitude and develop the final behaviour to purchase green products. The mediating effect of a specific green purchase attitude between environmental values and green purchase behaviour is not observed in this study ( $V \rightarrow GPA \rightarrow GPB$ ). Although green purchase attitude is the most prominent predictor of green purchase behaviour compared with general environmental attitudes, it is not an intervening variable influencing both environmental values and green purchase behaviour. Hence, mediating role of environmental attitude in the relationship between environmental values and green purchase behaviour should not be omitted. People who focus more on the welfare of others might be highly motivated to purchase green products by having stronger concern for the environment.

## 6. Conclusion

This study aims to determine the dimension of environmental values, investigate the predictors of green purchase behaviour, and link environmental values and two environment-related attitudinal variables (i.e., environmental attitude and green purchase attitude), to better predict and explain green purchase behaviour from Malaysian perspectives. The results indicate that although the unidimensional structure of environmental values fail to predict green purchase behaviour directly, these value orientations contribute significantly to forming such behaviour through environment-related attitudinal variables. In line with previous attitude-behaviour studies, specific attitudinal variable, namely, green purchase attitude acts as better predictor for green purchase behaviour. Unexpectedly, a general attitude variable, such as environmental attitude, both directly and indirectly affects green purchase behaviour. The significant roles of environment-related attitudinal variables (i.e., general and specific) in green purchase behaviour formation as well as their mediating roles in linking environmental values and such behaviour can motivate industry practitioners to integrate the final structural model confirmed in this study into their existing green business models. Finally, the unsustainable practices fueled by wasteful runaway consumerism will be reduced if each individual makes small changes to his or her lifestyle and consumption habits by selecting green products or services. Thus, each individual can make a worthy contribution to preserving the environment.

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