



Marketing Intelligence & Planning

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Article information:

To cite this document:

The Ninh Nguyen Antonio Lobo Steven Greenland , (2017)," The influence of cultural values on green purchase behaviour ", Marketing Intelligence & Planning, Vol. 35 Iss 3 pp. -

Permanent link to this document:

<http://dx.doi.org/10.1108/MIP-08-2016-0131>

Downloaded on: 18 March 2017, At: 10:19 (PT)

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The Influence of Cultural Values on Green Purchase Behaviour

Abstract

Purpose - This research aims to investigate the influence of consumers' collectivism and long-term orientation (LTO) cultural values on their purchase intention in relation to environmentally friendly products.

Design/methodology/approach - This research adopts a hypo-deductive research design. A unique conceptual model was developed by linking cultural values to key determinants of green purchase behaviour. This model was then tested using a quantitative survey of 682 shoppers in popular Vietnamese electrical appliance stores.

Findings – Analysis using structural equation modelling reveals that consumers with greater adherence to collectivism and LTO tend to engage in green purchase behaviour owing to their positive environmental attitudes, strong subjective norms, and tolerance of inconvenience associated with eco-friendly product purchase. Gender is found to moderate the relationship between the determinants and purchase intention.

Practical implications – Marketers including manufacturers and policymakers must endeavour to reduce or eliminate perceived inconvenience associated with green purchases. They should also effectively communicate messages stressing that eco-friendly product purchases are crucial for environmental protection and benefit consumer groups including family, peers and society in the long run.

Originality/value - This research is the first of its kind which links consumers' cultural values at a personal level to all the elements of the Theory of Planned Behaviour. This research also extends current knowledge about green purchase behaviour in emerging markets by focusing on Vietnam.

Keywords cultural values, collectivism, long-term orientation, green purchase behaviour, energy-efficient electrical appliances, emerging market, Vietnam

Paper type Research paper

1. Introduction

Promoting consumer pro-environmental behaviour is imperative (Steg and Vlek, 2009), and should be prioritised in emerging markets (Hsu, 2016; Keho, 2016). Many serious environmental problems are wrought by human activity (IPCC, 2014; UENP, 2015), and households are a key contributor to greenhouse gas emissions (Niemeyer, 2010; Pothitou *et al.*, 2016), particularly in emerging markets where consumer power is rapidly rising and the highest consumption growth rates are observed (Reusswig and Isensee, 2009; Keho, 2016). Hsu (2016) demonstrates that climate change mitigation in emerging countries is a global issue. Although public awareness of climate change and its associated environmental issues is higher than ever (IPCC, 2014), the proportion of consumers taking personal environmental responsibility remains limited (Cleveland *et al.*, 2012).

Pro-environmental behaviour denotes “any action that enhances the quality of the environment, either resulting or not resulting from pro-environmental intent” (Steg *et al.*, 2014, p. 104) and has been investigated for more than 40 years (Urien and Kilbourne, 2011). Green purchase refers to buying products that are environmentally beneficial (Mainieri *et al.*, 1997, p.189) and has the most direct positive impact on the environment (Mostafa, 2007). Previous research into the drivers of pro-environmental behaviour and green purchase has examined various factors ranging from the personal level of demographic and psychological variables, to the macro level including social and cultural value orientations (Leonidou *et al.*, 2010). From the 1970s to the 1990s, socio-demographics were the main focus of interest in profiling green consumers (Straughan and Roberts, 1999). Factors such as age, gender, income, education and social status were found to create differences in consumers’ environmental concerns and behaviour (e.g., Jackson, 1983; Zimmer *et al.*, 1994; Roberts, 1996). However, Diamantopoulos *et al.* (2003) comprehensively argue that, even though the influence of socio-demographics cannot be neglected, they are actually of limited value in profiling green consumers. One possible remedy for the inconsistent predictive validity of socio-demographics is to consider such variables as moderators, rather than as determinants (Peattie, 2010; Leonidou *et al.*, 2015).

In the past two decades, a growing volume of green consumer studies have focused on psychological factors. These combined value orientations such as personal values, cultural and country value orientations with components of Ajzen’s (1991) Theory of Planned Behaviour (TPB) including environmental beliefs and attitudes, subjective norms, and perceived behavioural control (PBC) to predict pro-environmental purchase behaviour (e.g.,

Follows and Jobber, 2000; Chan, 2001; McCarty and Shrum, 2001; Cheah and Phau, 2011; Soyez, 2012; Egea and de Frutos, 2013). The theoretical justifications for such a nexus are that values serve as standards or criteria for evaluating actions, people and events (Schwartz and Bilsky, 1987), and that values typically influence behaviour indirectly via determinants such as beliefs, attitudes and norms (Steg and De Groot, 2012). However, there is still no clear consensus on the interrelationships between values and green purchase behaviour (Tilikidou and Delistavrou, 2014; Nguyen *et al.*, 2015); and pro-environmental behaviour often varies across cultural contexts (Soyez, 2012).

Culture is defined as “a collective programming of the mind which distinguishes one group from another” (Hofstede, 1980, p. 25) and is an important dimension of consumer behaviour. Culture is represented as a set of value orientations (Kroeber and Kluckhohn, 1952) and studies of its impact on green consumption behaviour have frequently involved five cultural dimensions: power distance; individualism versus collectivism; uncertainty avoidance; masculinity; and long-term orientation (LTO) (Hofstede, 2001). Several studies have investigated cultural orientations at the national level (e.g., Soyez, 2012; Boeve-de Pauw and Van Petegem, 2013). However, examining cultural values at the personal level is particularly beneficial for two interrelated reasons. First, culture is embedded within every individual, forming distinctive thoughts and practices (Cho *et al.*, 2013, p. 1053). Second, cultural values may significantly vary among individuals within the one culture (McCarty and Shrum, 2001).

This research therefore develops and tests a model that links consumers’ cultural value orientations at the personal level with determinants of green purchase intention and indeed to all the elements of the TPB, which has not been attempted previously. The cultural values of collectivism and LTO have been selected as they are the most widely accepted drivers of pro-environmental behaviour (Leonidou *et al.*, 2010; Cho *et al.*, 2013). These cultural value orientations influence the determinants of TPB – namely environmental attitudes, subjective norms and PBC – which in turn affect consumer intention to purchase eco-friendly products. Furthermore, owing to the inconsistent results relating to the role of socio-demographic factors, this research also examines the moderating effects of gender on the relationship between the determinants and purchase intention. The issues relating to gender have received somewhat limited attention in environmental studies (Zeleny *et al.*, 2000), especially those performed in the Asian context (Lee, 2009).

A further contribution made by this study relates to its emerging market context. Most research has been conducted in Western, developed countries (Bodur and Sarigöllü, 2005;

Ramayah *et al.*, 2010). Several notable studies of green purchases in emerging countries found that consumers' attitudes towards green products and brands positively affected their purchase intention and commitment in countries such as China (Chan, 2001), Egypt (Mostafa, 2007), Taiwan (Huang *et al.* 2014) and India (Prashant and Bhimrao, 2015). However, whilst Ha and Janda (2012) confirmed the role of subjective norms in predicting Taiwanese consumers' intention to purchase energy efficient products, Paul *et al.* (2016) concluded that Indian consumers' green purchase intentions were not affected by social pressure. Wang *et al.* (2008) identified the limited availability and lower performance of energy efficient appliances as being key barriers for Chinese consumers. Regarding socio-demographic variables, a study in Hong Kong (Lee, 2009) revealed that males and females had distinct environmental concerns and green purchases, whereas an Indian consumer survey (Arpita, 2014) demonstrated that age, gender, education, and marital status exerted no influence on such behaviour. Clearly, given these inconsistent research findings, as well as the burgeoning environmental degradation occurring in these markets, further research into the drivers of green behaviour in emerging markets is essential.

To extend the current knowledge about green purchase in emerging markets, this study focuses on Vietnam, which is an important emerging market in South-East Asia. Vietnam's population of 92 million (General Statistics Office of Vietnam, 2015) is characterised by the predominant cultural values of collectivism and LTO (Hofstede, 2001). In 2015, the Gross Domestic Product (GDP) in Vietnam was \$193.599 billion, and the Gross National Income (GNI) per capita was \$1,980 (World Bank, 2016). The rapid growth of an energy-dependent economy and population, together with unsustainable consumption, have caused severe environmental problems and have doubled the carbon dioxide emissions (Taylor *et al.*, 2010; World Bank, 2016). Additionally, Vietnam has a low Environmental Performance Index, reflecting poor performance on the protection of human health and the ecosystem (Hsu, 2016). Despite government initiatives and corporate strategies aimed at enhancing green purchases, Vietnamese consumers still indicate a lack of ability (i.e. knowledge and money) and therefore opportunity for sustainable consumption (De Koning *et al.*, 2015). Hence, in addition to the theoretical contribution, this research should assist policymakers as well as marketers seeking to promote pro-environmental behaviour and to increase consumer demand for eco-friendly products, both in Vietnam and other markets.

2. Literature review and hypotheses development

2.1 Cultural values in the environmental domain

Collectivism and LTO are key considerations in understanding pro-environmental behaviour (Leonidou *et al.*, 2010). Collectivism refers to the conviction that individuals are closely linked as part of one or more groups such as family, peers and society (Triandis, 1995). Most collectivists are willing to prioritise group goals over their own personal ones (Sharma, 2010); hence, they are more likely to act in an environmentally friendly manner because it is good for the group. They are therefore more likely to demonstrate cooperative behaviour and forgo personal benefits when facing social dilemmas associated with green purchase behaviour (Kim and Choi, 2005; Leonidou *et al.*, 2010). LTO is the “fostering of virtues oriented towards future rewards, in particular, preservation and thrift” (Hofstede, 2001, p. 359). It reflects the extent to which an individual exhibits a pragmatic future-oriented point-of-view rather than a conventional historic or short-term perspective (Fuller *et al.*, 1993; Hofstede, 2001). Bearden *et al.* (2006) extended this definition by indicating that long-term oriented individuals value both the past and the future; thus, they emphasise long-term planning, tradition, hard work and persistence. In an environmental context, Leonidou *et al.* (2010) suggested that long-term oriented consumers are more likely to protect the natural environment to ensure sustainable conditions for their families and themselves to prosper in the future.

2.2 TPB in the environmental domain

The TPB developed by Ajzen (1991) claims that individuals are likely to engage in certain behaviour if they believe it will provide them with positive consequences (favourable attitudes) and social approval (subjective norms), and if they have greater control over performing the behaviour (PBC). In the environmental domain, consumer attitudes are central to the profiling of green consumerism (e.g., Stone *et al.*, 1995; Straughan and Roberts, 1999; do Paço and Raposo, 2009; Albayrak *et al.*, 2013). Prior literature has investigated general attitudes that reflect beliefs about environmental issues, as well as specific attitudes including judgments about certain eco-friendly products and environmentally-friendly behaviours. Given that pro-environmental behaviours often involve conflict between individual and collective gains, social norms may serve as a reference point for inducing individuals to contribute to environmental preservation (Biel and Thøgersen, 2007). Indeed, a consumer survey by Lee (2008) revealed that social influence is most important driver of green purchase behaviour.

Despite consumers' positive environmental attitudes and subjective norms, many do not actually make green purchases because they lack the opportunities and resources to conduct

such behaviour (i.e. low PBC). Ajzen (1991, p. 188) explains PBC as being “the perceived ease or difficulty of performing the behaviour.” Some pro-environmental studies have operationalised PBC as consumers’ control beliefs about different aspects such as cost, time, availability and product labelling (Tanner and Kast, 2003; Barbarossa and De Pelsmacker, 2016), which generally indicate perceived barriers or inconvenience relating to environmentally responsible behaviour. Indeed, Tanner and Kast (2003) used perceived time and monetary barriers as the key indicators of perceived control.

2.3 Relationships between cultural values and the TPB

2.3.1 Collectivism

Given that collectivists are more willing to prioritise the goals of groups over their own (Kim and Choi, 2005; Sharma, 2010), they are often more concerned for the public good including the environment. Many feel personally obliged to protect the environment so that their groups can enjoy prosperity (McCarty and Shrum, 1994; Cho *et al.*, 2013). The positive relationship between collectivism and environmental attitudes and concerns has been demonstrated in various early studies of environmental behaviour including green purchases (e.g., Chan, 2001; McCarty and Shrum, 2001; Leonidou *et al.*, 2010). Hence, the following has been hypothesised:

H1a. Consumers’ collectivism values will positively influence their environmental attitude associated with green purchases.

Consumers in a collectivist culture emphasise interpersonal relationships and develop a strong sense of responsibilities with regard to their groups including family, friends and colleagues (Hofstede, 2001; Cho *et al.*, 2013); hence, their behaviour is generally motivated by social norms (Sinha and Verma, 1987). Collectivists also often pay even more attention to social norms than attitudes to achieve social approval (Triandis, 2004). Hence, the following hypothesis has been developed:

H1b. Consumers’ collectivism values will positively influence their subjective social norm associated with green purchases.

Collectivists believe in the effectiveness of pro-environmental behaviour (Kim and Choi, 2005), and are therefore more likely to forgo personal costs and the added inconvenience associated with such behaviour. As illustration, such individuals who value group goals believe that recycling is important and disagree that it is too much trouble (McCarty and Shrum, 1994; 2001). Hence, the following hypothesis has been formulated:

H1c. Consumers' collectivism values will negatively influence their perceived inconvenience associated with green purchases.

2.3.2 Long-term orientation

Long-term oriented individuals generally show respect for traditions and families, and plan for future success. Consequently, they develop attitudes toward protecting the environment for their families and themselves to prosper in the future (Leonidou *et al.*, 2010). In relation to environmental protection, some empirical studies have confirmed that consumers with LTO recognise the high environmental impact of cars (Joireman *et al.*, 2004), and that they generally display higher concern and attitude toward the environment (Sarigöllü, 2009; Milfont *et al.*, 2012; Polonsky *et al.*, 2014). Hence the following has been hypothesised:

H2a. Consumers' LTO will positively influence their environmental attitude associated with green purchases.

Given that consumers with LTO are more likely to carefully manage money and consider alternatives when making purchase decisions (Hofstede, 2001; Sharma, 2010), they are assumed to search for opinions and support from others that are important to them. This is particularly relevant in an environmental context, where consumers may be uncertain about the consequences of pro-environmental behaviour (Bratt, 1999). Furthermore, long-term oriented consumers are socially-conscious and emphasise future relationships within their society (Hofstede, 2001; Bearden *et al.*, 2006); thus they tend to avoid the violation of social norms. Hence, the following hypothesis has been formulated:

H2b. Consumers' LTO will positively influence their subjective social norm associated with green purchases.

Long-term oriented consumers value benevolence and morality (Hofstede, 2001; Bearden *et al.*, 2006), which have commonly been identified as motivators for engaging in pro-environmental behaviour regardless of personal costs (e.g., Thøgersen and Grunert-Beckmann, 1997). Furthermore, such consumers are generally hardworking, persistent and innovative (Soares *et al.*, 2007; Yoo *et al.*, 2011), and are therefore likely to overcome barriers such as extra effort and uncertainties in relation to products and eco-labels associated with green purchasing. The following hypothesis has therefore been formulated:

H2c. Consumers' LTO will negatively influence their perceived inconvenience associated with green purchases.

2.3.3 Environmental attitude

Scholars including Mainieri *et al.* (1997) and Tanner and Kast (2003) argued that consumers with positive environmental attitudes are more likely to actually perform corresponding behaviour. For example, Pagiaslis and Krontalis (2014) revealed that individual beliefs about biofuels positively influence behavioural intention. Another study by Ha and Janda (2012) pointed out that consumers' positive attitudes toward energy-efficient products are significantly correlated with their intention to purchase such products. Hence, the following has been hypothesised:

H3. Consumers' environmental attitude associated with green purchases will positively influence their green purchase intention.

2.3.4 Subjective norm

Consumers that are uncertain about the consequences of pro-environmental behaviour may seek support from others (Bratt, 1999). Even though Thøgersen and Zhou (2012) suggested that subjective norms play no role in predicting purchase intention towards green products such as organic food in China, other studies demonstrate contradictory results. For example, Wang (2014) indicated that subjective norms exert a significantly positive influence on green purchasing, as compounded by Moons and De Pelsmacker's (2012) finding that they are significant influences on electric car usage. Hence, the following hypothesis has been developed:

H4. Consumers' subjective social norm associated with green purchases will positively influence their green purchase intention.

2.3.5 Perceived inconvenience

Green purchasing generally requires consumers to overcome barriers and inconveniences such as lack of information, high prices, greater efforts and limited availability (Kalafatis *et al.*, 1999; Steg, 2008; Gleim *et al.*, 2013; de la Rue du Can *et al.*, 2014; Barbarossa and Pastore, 2015). For instance, Tanner and Kast (2003) reported that consumers who perceive higher time barriers generally buy less green food. More recently, Barbarossa and De Pelsmacker (2016) confirmed that consumer perceptions of inconvenience when green purchasing exert a negative influence on their purchase intention and behaviour. Hence, the following hypothesis has been developed:

H5. Consumers' perceived inconvenience associated with green purchases will negatively influence their green purchase intention.

2.4 Moderating effects of gender

Because of differences in biology, socialisation and value orientations, females and males tend to think and behave diversely (Stern *et al.*, 1993; Zelezny *et al.*, 2000; Putrevu, 2001). Several studies have investigated the moderating effects of gender and concluded that the environmental attitude-behaviour correlation is higher for females than males (e.g., Schahn and Holzer, 1990; Tarrant and Cordell, 1997). A possible explanation for this difference is that females have higher environmental concern and are more environmentally responsibility compared to males (Lee, 2009). Hence, the following has been hypothesised:

H6a. The positive influence of environmental attitude on green purchase intention will be stronger for female than for male consumers.

Women assign more importance to social goals and group connectedness, whereas men are less concerned with social affiliations (Straughan and Roberts, 1999; Hofstede, 2001). Women were found to be motivated by social interaction more than men (Noble *et al.*, 2006). Lee (2009) also demonstrated that female consumers were more susceptible to peer influence on green purchases. Hence the following hypothesis has been developed:

H6b. The positive relationship between subjective social norms and green purchase intention will be stronger for females than for male consumers.

Women generally place more emphasis on self-transcendence values reflecting concern for the welfare of others, compared to men who advocate stronger adherence to self-enhancement values motivated by personal outcomes (Schwartz, 1992; Schwartz and Rubel, 2005). Previous studies have revealed that, while consumers who endorse self-transcendence values are more concerned about the environment when making purchases, those with strong adherence to self-enhancement values are more likely to associate green purchase with negative personal outcomes (e.g., Follows and Jobber, 2000; Ramayah *et al.*, 2010). It can therefore be argued that women will be less influenced by perceived inconvenience associated with green purchases as compared to men. Hence, the following hypothesis has been formulated:

H6c. The negative influence of perceived inconvenience on green purchase intention will be weaker for female than for male consumers

The hypothetical relationships between each of the variables examined in this study are next depicted in Figure 1.

[Insert Figure 1 about here]

3. Method

3.1 Selected product category

Energy-efficient electrical household appliances were selected as the product category to study for four reasons. First, energy efficiency has the most potential to reduce greenhouse gas emissions globally (Sonnenberg *et al.*, 2011), particularly in emerging markets like Vietnam (Taylor *et al.*, 2010). Second, the factors that influence consumption of energy-efficient products are still not fully understood (Tangari and Smith, 2012). Third, the Vietnamese Government already promotes the use of energy-efficient appliances through its National Energy Efficiency Standard and Labelling Program (Energy Efficiency and Conservation Office, 2012). Fourth, Vietnam has skyrocketing electricity prices, which should increase consumers' interest in energy-efficient appliances (Euromonitor International, 2014).

3.2 Measures

Collectivism was operationalised in the questionnaire using five items which were adapted from scales developed by McCarty and Shrum (2001) and Sharma (2010). These items were intended to capture respondents' relationships with their preferred group in terms of striving for group goals, participating in group activities, cooperating and looking after the wellbeing of the group, and spending time with the group. *Long-term orientation* was operationalised using six items adapted from scales developed by Sharma (2010) and Yoo *et al.* (2011). These items were intended to capture respondents' perceptions of the importance of money management, perseverance, planning for the long term, long-term stability, hard work and making sacrifices to gain success in the future.

Environmental attitude was operationalised by adapting four items from the former studies of McCarty and Shrum (1994) and Tanner and Kast (2003). These items were designed to seek the respondents' perceptions of the importance of environmental protection when purchasing household appliances, and in terms of how energy-efficient appliances contribute to

environmental preservation. Four items operationalising *subjective norms* were also developed using inputs from Thøgersen (2008) and Wang (2014). These items sought respondents' perceptions on the influence of people close to them in purchasing energy-efficient household appliances. Another four items for measuring *personal inconvenience* were also developed using inputs from Barbarossa and De Pelsmacker's (2016) and Tanner and Kast's (2003). These items sought to understand respondents' perceived barriers relating to the purchase of energy-efficient appliances, such as price, time, and confidence in energy rating labels. This study focuses on similar barriers because they appear to be the key elements which hinder the purchase of energy efficient products in several countries including Vietnam (de la Rue du Can *et al.*, 2014; De Koning *et al.*, 2015). Finally, to measure *purchase intention* during the next 12 months, four items were adapted from Wang (2014) and Mostafa (2007).

The items operationalising all the constructs outlined above were measured using 7-point scales. To measure cultural values, attitudes, subjective norms, perceived inconvenience and purchase intentions, the scale was anchored at 1 for 'strongly disagree' and 7 for 'strongly agree'. To measure purchase behaviour, the scale was anchored at 1 for 'never' to 7 for 'always'.

3.3 Pre-testing

A two-round pre-test was conducted prior to data collection. To ensure the representativeness and suitability of survey items, eight business academics and industrial experts were invited to discuss and scrutinise the survey instrument. This was followed by separate in-depth interviews with six selected consumers for the purposes of diagnosing and eliminating potential problems relating to instrument clarity, question wording, and time to complete. Subsequent to the pre-tests, several minor changes were made to the survey instrument.

In designing the questionnaire, care was taken to avoid any item-context effects, such as priming due to the order of questions (Podsakoff *et al.*, 2003). Furthermore, the survey instrument was split into two parts, to separate the exogenous variables from the endogenous.

3.4 Respondents and Procedure

The respondents were Vietnamese citizens aged 18 years and above who had been involved in purchasing electrical appliances and expressed interest in energy-efficient electrical appliances. This ensured that respondents had a certain level of knowledge and interest relating to the product category; thus improving the prediction of purchase intention.

Data were collected from eligible shoppers who visited five busy electronics and appliance specialist stores - three in Hanoi in the north and two in Ho Chi Minh City in the south. Trained interviewers were stationed at these five stores to identify eligible respondents and distribute the questionnaires. Given the absence of a sampling frame, non-probability volunteer sampling was used (Saunders *et al.*, 2012). Shoppers were selected by approaching every fifth person entering the stores, and each was presented with the informed consent statement and asked to complete the survey in store. Facilities were provided for those respondents who agreed to participate in the survey. Respondents' anonymity and confidentiality were assured, and it was emphasised that there were no right or wrong responses. This assisted in minimizing respondents' evaluation apprehension and social desirability when providing answers (Podsakoff *et al.*, 2003).

The 703 completed questionnaires were screened to examine for missing data, outliers and normality of distribution. Subsequently, 13 responses were removed that contained missing values, whilst another 8 were eliminated as being multivariate outliers. Hence, a final effective sample of 682 responses was achieved.

As stated by the General Statistic Office of Vietnam (2015), the ratio of men to women in Vietnam is 49:51, which is similar to that obtained in our sample. According to the Population and Housing Survey published by the General Statistic Office of Vietnam (2014), the percentage of persons aged 20-29, 30-39, 40-49, 50-59 and 60-69 was 18.90%, 15.60%, 13.30%, 8.60% and 4.10% respectively. The age groups in our sample were arranged in a similar descending order, i.e. 18-29, 30-39, 40-49, 50-59 and 60+ years. The percentages of respondents in these age groups was 29.60%, 24.50%, 22.60%, 14.40% and 8.90% respectively. As can be seen from these figures, the percentages of the various age groups of the sample closely resembles that of the population. Slight differences occur owing to the sample age groups being 18-29 and 60+ as compared to the published population age groups of 20-29 and 60-69 years. Additionally, the marriage incidence of people in our sample for people aged 18+ was 62%, which is similar to that published in the population data. Finally, our sample closely represents the trend in Vietnam for the vast majority of people to hold degree qualifications. This is owing to the Education Reform and the presence of 445 universities and colleges nationwide (GSO, 2015). Generally speaking, our sample is fairly representative of the national profile data.

4. Data analysis

The data analysis consisted of four stages. Initially, preliminary analysis was performed to assess the potential effects of common method bias and scale reliability. Second, confirmatory factor analysis (CFA) was run to examine the validity of the measurement model. Third, the hypotheses were tested using structural equation modelling (SEM). Finally, the moderating effects of gender were investigated using multi-group SEM.

The goodness-of-fit (GOF) of the model was examined using widely-applied fit indices including χ^2/df (Chi-square to degree of freedom ratio), GFI (goodness-of-fit index), CFI (comparative fit index), TLI (Tucker and Lewis index), and RMSEA (root-mean-square error of approximation). According to other studies such as Hu and Bentler (1999) and Hair *et al.* (2010), the model fit is good when $\chi^2/df < 3$, the values of GFI, CFI, TLI $\geq .90$, and RMSEA $\leq .08$.

4.1 Preliminary analysis

Given that common method bias may cause measurement error which affects relationships between measures, Harman's single-factor test was conducted (Bagozzi and Yi, 1990; Podsakoff *et al.*, 2003). Accordingly, all measurement items used in this study were subjected to an exploratory factor analysis using SPSS 23. The un-rotated factor solutions revealed that the single factor explained only 26% of the variance in the variables. Hence, it was assumed that common method bias was unlikely to affect this study's measures and the sample data (Malhotra *et al.*, 2006). To further address the concern about common method bias, latent common methods factor was also used and the results are presented later in this section.

In addition, reliability analysis demonstrated that Cronbach's alpha (α) values for constructs ranged from .81 to .88. Moreover, corrected item-to-total correlations were all greater than .50. Hence, it is reasonable to assume that all the measures have good internal consistency of reliability (Churchill, 1979; Hair *et al.*, 2010).

[Insert Table 1 about here]

4.2 Measurement Model Validity – CFA

To assess the measurement model fit, all constructs were subjected to CFA (maximum likelihood estimation) using AMOS 23.0. The resulting statistics were all above the acceptable level ($\chi^2(309) = 454.77$, $p < .001$; $\chi^2/df = 1.47$; GFI = .95; CFI = .98; TLI = .98;

RMSEA = .03). These indices therefore revealed a good model approximation to the sample data.

Construct validity was assessed using both convergent and discriminant validity. As recommended by Hair *et al.* (2010), convergent validity was assessed based on these three conditions: (1) standardised factor loadings values were above .50; (2) composite reliability (CR) was higher than average variance extracted (AVE), and CR was above .70; and (3) AVE was above .50 (Hair *et al.*, 2010). As shown in Table 1, the relevant data indicated strong convergent validity. Furthermore, Table 2 shows that the square root of the AVE of each measure was higher than its bivariate correlation coefficients with other constructs, confirming discriminant validity (Fornell and Larcker, 1981). In addition, all correlations between constructs were less than .70, thus possible problems of multi-collinearity were non-existent (Grewal *et al.*, 2004).

To confirm the assumption about common method effects, another CFA was conducted for all constructs and an added common method factor (Podsakoff *et al.*, 2003). Specifically, all measured items were allowed to load on their respective theoretical constructs, as well as on the unmeasured common method factor. The results showed that the method factor accounted for only 13% of the total variance, which was much less than the typical method variance (25%) reported by Williams *et al.* (1989). Hence, it is reasonable to conclude that common method bias did not affect the results observed in this study.

[Insert Table 2 about here]

4.3 Hypotheses Testing – SEM

SEM was used to test the proposed hypotheses. The resultant indices were $\chi^2 (314) = 563.46$, $p < .001$; $\chi^2/df = 1.79$; GFI = .94; CFI = .97; TLI = .96; RMSEA = .03. These GOF measures altogether indicated a good fitting model which explained a significant 24% of the variation in consumer intention to purchase energy-efficient appliances.

[Insert Table 3 about here]

The results of hypotheses testing are depicted in Table 3. As indicated, all the relationships between each of the variables were significant at the .001 level; thus H1, H2, H3, H4 and H5 were accepted. Collectivism was positively associated with positive environmental attitude ($\beta = .31$) and strongly with subjective norm ($\beta = .47$), and it was negatively correlated with perceived inconvenience ($\beta = -.29$). Similar relationships were found between LTO and environmental attitude ($\beta = .41$), subjective norm ($\beta = .15$) and perceived inconvenience ($\beta = -.16$). Furthermore, collectivism had the strongest impact on subjective norm, whereas LTO exerted the strongest influence on environmental attitude. As expected, attitude ($\beta = .16$) and subjective norm ($\beta = .26$) exerted a significant positive influence on green purchase intention. Notably, perceived inconvenience was a strong barrier for purchase intention ($\beta = -.28$).

4.4 Testing for moderating effects of gender

Multi-group SEM (Hair *et al.*, 2010) was performed to examine proposed moderating effects of gender on the influence of the determinants on green purchase intention. This technique comprises two main stages: measurement invariance; and structural invariance (i.e. structural model estimate). Whilst the former determines whether relationships between latent constructs and measured variables are invariant between groups, the latter examines whether regression weights for each of the structural paths are statistically invariant between the groups (Byrne, 2004; Hair *et al.*, 2010).

In this study, the sample was divided into two consumer groups: males ($n = 336$); and females ($n = 346$). The measurement invariance analysis consisted of configural invariance and metric variance. The configural invariance model showed good fit ($\chi^2(618) = 784.09$, $p < .001$; $\chi^2/df = 1.27$; GFI = .92; CFI = .98; TLI = .97; RMSEA = .02), confirming that the same number of constructs and items associated with each construct existed in the two groups. Given full metric invariance was not supported ($\Delta\chi^2(27) = 51.21$, $p < .01$), partial metric invariance (PMI) was employed by freeing three of the most restrictive constraints (Byrne *et al.*, 1989). PMI was confirmed ($\Delta\chi^2(24) = 34.75$, $p > .05$), ensuring that the factor loadings were equivalent across both consumer groups.

As the measurement invariance was ensured, a structural model estimate was assessed to test the hypotheses about the moderation. This analysis started with estimation of a fully unconstrained model in which all paths were set free across both groups, followed by estimation of a constrained model in which the path of interest was constrained to ensure equality between the two consumer groups. According to Hair *et al.* (2010), paths under

examination are statistically different if the group model fits differ significantly (i.e. the Chi-square difference ($\Delta\chi^2$) is significant).

The results of the structural invariance analysis showed that the environmental attitude-purchase intention path ($\Delta\chi^2(1) = 5.94, p < .05$); and perceived inconvenience-purchase intention path ($\Delta\chi^2(1) = 6.61, p < .05$) significantly differed, whereas the subjective norm-purchase intention path ($\Delta\chi^2(1) = .06, p > .05$) did not significantly differ across females and males. These results imply that gender moderated the relationship between green purchase intention and the two determinants: environmental attitude; and perceived inconvenience. Hence, H6a and H6c were accepted, whilst H6b was rejected. Specifically, environmental attitude exerted a stronger impact on purchase behaviour for females ($\beta = .26$) than for males ($\beta = .02$). Additionally, female consumers ($\beta = -.17$) were less affected by perceived inconvenience than male consumers ($\beta = -.43$). Finally, there was no moderating effect of gender on the subjective norm-purchase intention association.

5. Discussion of findings

The findings show that the consumers' cultural values of collectivism and LTO facilitate their green purchase behaviour by enhancing their environmental attitudes and subjective norms, and by mitigating the perceived inconvenience associated with green purchasing. This extends previous research by Chan (2001) and Leonidou *et al.* (2010), which focused on the influence of collectivism and LTO on attitudes. Interestingly, the findings contradict other studies (e.g., Laroche *et al.*, 2001; Kim and Choi, 2005) which found the relationship between cultural values and environmental concern was not significant. Notably, collectivism exerts the strongest impact on subjective norms. The current study supports the finding of Triandis (2001) who stated that collectivists' behaviour is typically regulated by in-group norms.

LTO exerts its greatest influence on environmental attitudes. This finding is consistent with prevailing knowledge that pro-environmental behaviour including green purchasing usually provides environmental benefits in the long term rather than the short term (e.g., Nordlund and Garvill, 2002; Milfont *et al.*, 2012), and also that long-term oriented consumers often emphasise future benefits in relation to the environment (Hofstede, 2001; Yoo *et al.*, 2011).

Another key finding is that consumers' environmental attitudes and subjective norms have a significant positive influence on their purchase intention. This supports the TPB and empirical evidence from prior studies in both developed and developing countries (e.g., Ha

and Janda, 2012; Soyez, 2012; Wang, 2014). Notably, the influence of subjective norms is greater than that of environmental attitudes, which could be because Vietnam is a collectivist society where consumers rely heavily on social norms when making purchase decisions. This important role of subjective social norms contradicts the non-significant relationship suggested between Indian consumer's social norms and their green purchase intention as reported by Paul *et al.* (2016).

Consistent with earlier studies (e.g., Tanner and Kast, 2003; De Koning *et al.*, 2015; Barbarossa and De Pelsmacker, 2016), this study also reveals that consumers' perceived inconvenience presents barriers to their green purchase intentions and behaviour. Some of these inconveniences manifest themselves in extra time and effort, higher prices, and lack of trust in energy rating labels. Lastly, the positive relationship between green purchase intention and behaviour identified in this study echoes findings from green purchase behaviour studies in other emerging markets such as China (Chan and Lau, 2000) and Egypt (Mostafa, 2007).

The final main contribution of this study is that it highlights the moderating effects of gender. Female consumers appear to rely more on their beliefs about the importance of green products for the environment when making purchase decision. Male consumers are more influenced by their perceptions that green purchases are associated with barriers such as higher price, extra time and effort required and unclear labelling. These findings extend prior studies by demonstrating that gender moderates the environmental attitude-behaviour relationship (e.g., Schahn and Holzer, 1990; Tarrant and Cordell, 1997). The findings also support the argument that consumers who are more concerned about environmental benefits are likely to downplay negative individual consequences when considering green purchases (e.g., Steg and De Groot, 2012; Van der Werff *et al.*, 2013; Perlaviciute and Steg, 2015).

6. Implications

The findings of this study should assist marketers in identifying target markets and developing effective strategies to promote green purchase and consumption. The results reveal that green consumers are females who prioritise group connectedness and benefits, and who emphasise future rewards, hard work and persistence. Such targeted consumers tend to focus their attention on environmental benefits of green products, they place emphasis on social norms and also downplay barriers of green purchases. Policy makers and pro-environmental campaigners should leverage on these findings and target female groups to

accelerate the uptake of energy efficient appliances. They should also endeavour to enhance the collectivism and LTO values of the male population and increase their awareness and knowledge about the benefits of pro-environmental purchase behaviour. This will certainly be advantageous to the environment and society in the long run.

Owing to the significance of collectivism and LTO as demonstrated in this study, it is important to increase the importance level which consumers attach to such values. Hitlin and Piliavin (2004) postulate that changes in values can be achieved through information processing. Therefore, social institutions should implement informational intervention strategies that emphasise key dimensions of collectivism and LTO such as group goals, social interaction and future benefits. Given that values are enduring beliefs, such strategies require extensive efforts and cooperation among educational institutions, corporations, businesses and government organisations. Furthermore, pro-environmental campaigners should deliver compelling and convincing messages to the general public. Such initiatives would encourage the purchase of eco-friendly products including energy-efficient appliances, which in turn would benefit consumer groups including their families, peers and the society in the long run.

Similarly owing to the significance of environmental attitudes as demonstrated in this study, it would be desirable to highlight the importance of green purchases for the environment. Additionally, consumers should be made aware of the fact that the purchase of energy-efficient appliances would reduce air pollution and protect natural resources. Conversely, it would be worth reiterating to consumers that overconsumption of conventional products has severe environmental consequences. In addition, the importance of subjective norms as demonstrated in this study emphasises the influence of peers. Marketing campaigns would therefore benefit from featuring social leaders and influencers to emphasise that families, as well as other influential groups, and society at large expect consumers to go green.

This study has also revealed that consumers harbouring strong collectivism and LTO values are more willing to accept the perceived inconvenience caused by non-availability, higher costs and more effort in purchasing energy-efficient appliances. Nevertheless, pro-environmental marketers must endeavour to reduce or eliminate perceived inconveniences so that such appliances are sought after by others whose collectivism and LTO values are relatively weak. Government policy makers and regulators might also do more to encourage manufacturers to reduce the inconvenience dimensions. In this respect, retailers could make it easier for consumers seeking energy-efficient appliances by providing more attractive and conspicuous signage at the point of purchase, and by also providing more accessible shelving.

In addition, manufacturers of energy-efficient appliances should convey honesty and effectiveness, as several consumers in this study indicated wariness of the authenticity of manufacturers' social and environmental responsibility activities including their claims about green products.

7. Conclusion and future research

The model presented in this study is unique in that it links consumers' cultural values at a personal level to all the elements of TPB – this has not been attempted previously. This study improves the understanding of how consumers' cultural values influence their environmental attitude, subjective norms and perceived inconvenience, all of which in turn influence their green purchase intention and purchase behaviour. It also effectively illustrates the moderating effects of gender on the relationship between the purchase determinants and purchase intention. Furthermore, given the paucity of knowledge relating to pro-environmental behaviour in developing countries (Ramayah *et al.*, 2010), this study addresses the identified literature gap by focussing on the Vietnamese context. The potential beneficiaries of this research include consumers as well as those interested in understanding the drivers of sustainable consumption including various stakeholders in Vietnam and other emerging markets, and international governments and agencies.

The limitations of this study can be classified into two broad areas. First, other relevant personal values in addition to cultural values were not included as exogenous variables in the proposed model. These additional exogenous variables could include, *inter-alia* and consumers' altruistic and egoistic values; such additional personal values could be added to test and improve the model's sufficiency in predicting consumers' purchase behaviour of energy-efficient appliances. Second, this study is confined to energy-efficient appliances. Future research could test the proposed model in other areas of sustainability, such as the consumption of organic and biodegradable products, as well as other environmentally-friendly retail and service delivery contexts. Third, the present study utilised only gender as a moderator. Future studies could also investigate the moderating effects of other demographic factors such as education and income levels. Fourth, several relevant elements of PBC were not examined in this study. Future research could therefore include product availability and regulatory requirements to better understand the impact of all the aspects of PBC on purchase behaviour.

This study's proposed model presents a wide variety of future research possibilities. Future studies could investigate whether the model stands up to scrutiny in other important emerging markets like Malaysia, China and India. Additionally, it would be beneficial to investigate changes in consumers' attitudes and their behavioural intentions over time by conducting a longitudinal study. Lastly, whilst not the intent of this paper, the dataset lends itself to exploring the impact of the different segmentation and socio-demographic variables of the study's respondents.

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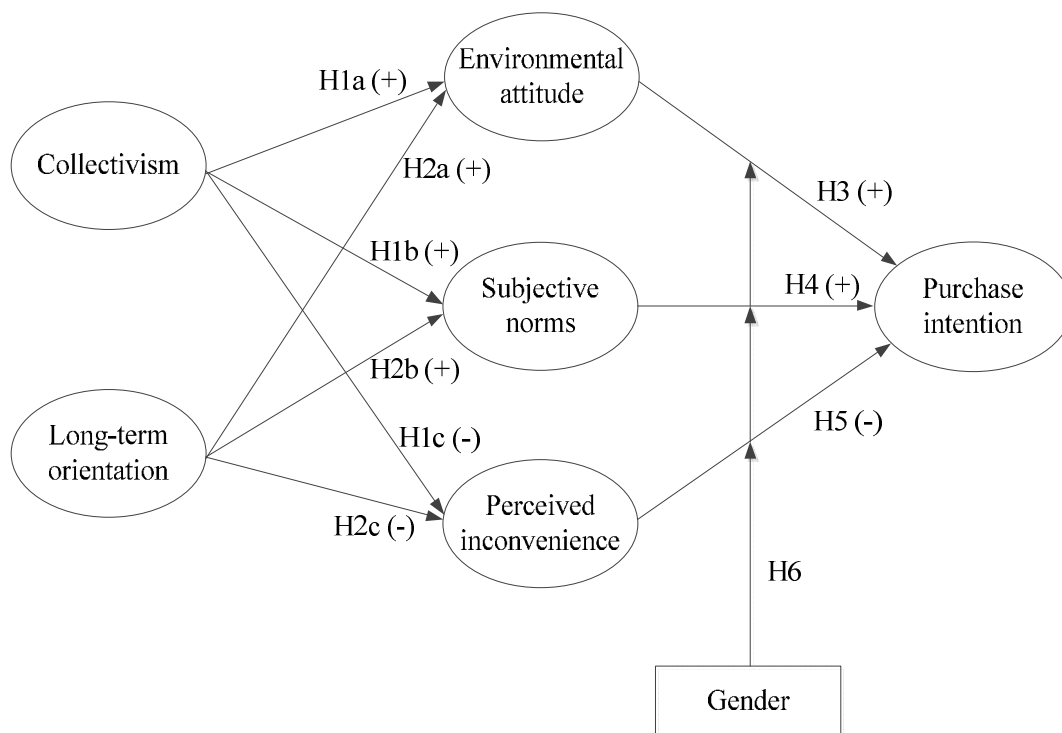


Figure 1. The proposed model of the study

Table 1. Measurement Items and Properties

Construct and items	FL	α	CR	AVE
Collectivism		.83	.83	.50
I work hard for the goals of a group, even if it does not result in personal recognition	.72			
I am a cooperative participant in group activities	.71			
Group members should stick together, even if they do not agree	.76			
The wellbeing of my group members is important to me	.71			
I enjoy sharing items and spending time with my group members	.65			
Long-term orientation		.88	.88	.54
Careful management of money is important to me	.72			
I do not give up easily even if I do not succeed in my first attempt	.73			
I believe in planning for the long term	.75			
I value personal steadiness and stability	.73			
I work hard for success in the future	.77			
I don't mind giving up today's fun for success in the future	.71			
Environmental attitudes		.81	.82	.52
Environmental protection is important to me when making purchases of appliances	.71			
Energy-efficient appliances are important to reduce air pollution	.75			
Energy-efficient appliances are important to save natural resources that would be used for producing energy, e.g. coal, water	.68			
If I can choose between energy-efficient and conventional appliances, I prefer energy-efficient	.75			
Subjective social norms		.83	.83	.55
Most of the people who are important to me think that I should buy energy-efficient appliances	.78			
Most of my acquaintances expect me to buy energy-efficient appliances	.74			
Most of the people who are important to me would support me buying energy-efficient appliances next time	.72			
The people I listen to could influence me buying energy-efficient appliances	.73			
Perceived inconvenience		.82	.82	.53
I cannot afford to pay more to buy energy-efficient appliances	.70			
While shopping, I can't easily distinguish between energy-efficient and conventional electrical appliances	.75			
I need a lot of extra time to purchase energy-efficient appliances	.74			
I am not confident about the credibility of energy rating labels	.72			
Purchase intention		.84	.84	.57
I will consider buying energy-efficient appliances	.79			
I plan to switch to other brands/versions of electrical appliances that are more energy-efficient	.76			
I intend to buy energy-efficient appliances	.79			
I will buy energy-efficient appliances in my next purchase	.67			

Table 2. Descriptive Statistics and Correlations

	Mean	SD	COL	LTO	EA	SN	PI	INT
Collectivism (COL)	5.01	.97	.71					
Long-term orientation (LTO)	4.85	1.11	.27**	.74				
Environmental attitudes (EA)	4.90	1.05	.35**	.43**	.72			
Subjective social norms (SN)	4.68	1.21	.41**	.25**	.32**	.74		
Perceived inconvenience (PI)	3.24	1.03	-.25**	-.21**	-.30**	-.41**	.73	
Purchase intention (INT)	4.65	1.20	.19**	.08*	.29**	.37**	-.37**	.76

Note: Diagonal value indicates the square root of AVE of construct

** Correlation is significant at the 0.01 level; * correlation is significant at the 0.05 level

Table 3. Results of Hypotheses Testing

Path between	β	<i>t</i> -Value
<i>H1a</i> Collectivism → Environmental attitudes	.31	6.78***
<i>H1b</i> Collectivism → Subjective social norms	.47	9.16***
<i>H1c</i> Collectivism → Perceived inconvenience	-.29	-5.84***
<i>H2a</i> Long-term orientation → Environmental attitudes	.41	8.62***
<i>H2b</i> Long-term orientation → Subjective social norms	.15	3.33***
<i>H2c</i> Long-term orientation → Perceived inconvenience	-.16	-3.49***
<i>H3</i> Environmental attitudes → Purchase intention	.16	3.40***
<i>H4</i> Subjective social norms → Purchase intention	.26	5.62***
<i>H5</i> Perceived inconvenience → Purchase intention	-.28	-6.13***

Note: β = standardised regression coefficient of path relationship; *** $p < .001$