

# Dynamics of environmental consciousness and green purchase behaviour: an empirical study

Aditi Mishal

*Symbiosis Institute of Operations Management, Maharashtra, India*

Rameshwar Dubey

*Montpellier Business School, Montpellier, France*

Omprakash K. Gupta

*University of Houston Downtown, Houston, Texas, USA, and*

Zongwei Luo

*Southern University of Science and Technology, Guangdong, China*

## Abstract

**Purpose** – The purpose of this paper is to investigate the relationships between environmental consciousness (ECO), green purchase attitude (GPA), green purchase intention (GPI), perceived customer effectiveness (PCE), green behaviour (GRB) and green purchase behaviour (GPB). Based on the statistical analyses, this paper offers some further research directions to advance the extant literature.

**Design/methodology/approach** – The theoretical model is firmly grounded in extant literature. To test the study hypotheses, the authors have developed a survey instrument following a two-stage process. The constructs were first operationalized by the authors and then pre-tested by experts. Dillman's (2007) guidelines were then followed to gather data. Finally, the theoretical model was tested using multivariate statistical tools.

**Findings** – Results indicate that ECO has an influence on GPA and PCE; GPA has an influence on PCE and GRB; GPI has an influence on PCE; and GRB has an influence on GPB. Environmental benefit still ranks at the sixth position among eight product-selection criteria, as is evident from qualitative in-depth interviews indicating a primarily rationalistic and not an altruistic purchase approach. The gap in translation of ECO into GB and GPB can be attributed to costliness, non-availability with less variety, lack of brand reputation of green products and budget constraints for customers.

**Research limitations/implications** – The study faces the limitation of generalizability of the results because it was carried out in a particular state in India; it may not be the perception of the country as a whole. The bias owing to social desirability, selective memory and telescoping with the use of self-reported data could also be a limitation for the current empirical study.

**Originality/value** – This study aimed to extend pro-environmental behaviour studies beyond developed countries and to empirically validate the models built on the theory of ECO leading to GPB, especially for India, a rising market. A novel approach to empirically discuss the situational and market factors will provide a much-needed thrust for research on these lines.

**Keywords** Environmental consciousness, Green behaviour, Green purchase attitude, Green purchase behaviour, Green purchase intention

**Paper type** Research paper



## 1. Introduction

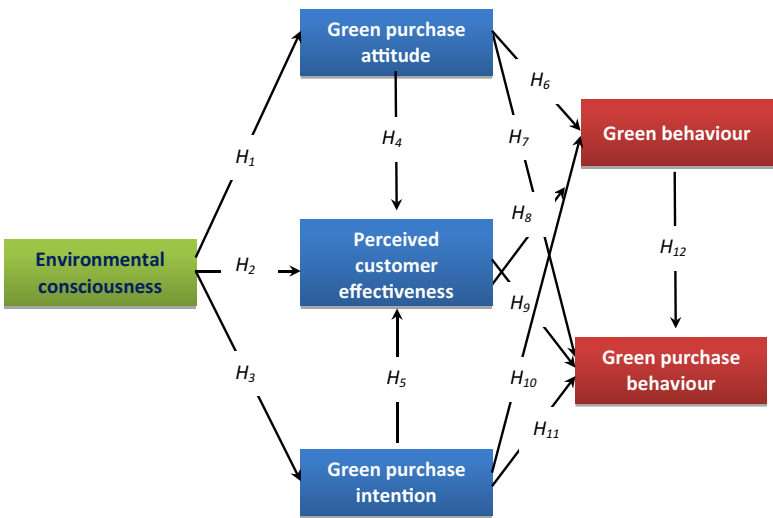
Environmental protection is a pressing concern for the entire globe. There is a rich body of literature on low-carbon emission (Bord *et al.*, 2000; Renukappa *et al.*, 2013; Jones, 2014; Li and Lin, 2016; Du *et al.*, 2016), green manufacturing (Montalvo, 2008; Deif, 2011; Singh *et al.*, 2012; Bhattacharya *et al.*, 2015), sustainability strategies (Law and Gunasekaran, 2012; Mangla *et al.*, 2013; Harik *et al.*, 2015), responsible manufacturing (Bazan *et al.*, 2017), environment management (Massoud *et al.*, 2010; Zhang *et al.*, 2009), responsible purchasing (Mont and Leire, 2009; Winter and Lasch, 2016), environment-friendly technology (Luken *et al.*, 2008; Gutowski *et al.*, 2005), product recovery (Kapetanopoulou and Tagaras, 2011), etc. Ultimately, the aim of all these studies is related to the central theme of protecting the environment and building environmental consciousness (ECO). The research on ECO has gained significant attention of scholars owing to improved awareness among consumers about environmental issues (Kalafatis *et al.*, 1999; Gleim and Lawson, 2014; Sinha and Anand, 2017).

Wu and Chen (2013) argue that the stakeholders involved in promoting ECO are as follows: the government, the organizations offering goods and services and the consumers of these goods and services. The government has the role of creating awareness throughout the nation about the ill effects of goods that are harmful to the environment, the manufacturers have the responsibility towards preserving and improving the environment by manufacturing greener products and the consumers have the responsibility of protecting the environment by saying no to the goods that are harmful to the environment. Along with the top-down approach where the government drives sustainability efforts, equally important is the bottom-up responsiveness of customers and manufacturers to these green initiatives (Hsu and Lin, 2015). Researchers are also exploring the green gap (ECO and green behaviour [GRB]) with increased research on factors explaining this phenomenon (Mahoney, 2011 in Gleim and Lawson, 2014). Despite increasing literature focusing on ECO, GRB and green purchase behaviour (GPB), theory-focused research that attempts to examine the linkages between ECO, GRB and GPB is still underdeveloped. Hence, by testing a theoretical framework (see Figure 1), we further our understanding related to ECO and its influence on GRB and GPB. In previous studies, scholars have found that higher ECO leads to higher perceived customer effectiveness (PCE; Tan, 2011; Joonas, 2008; Ozmete, 2007), which is in turn a predictor of GPB (Lee, 2009; Chan, 2001). Green purchase attitude (GPA; Klaus *et al.*, 2014; Thøgersen and Zhou, 2010; Tung *et al.*, 2012) is also remarked as a significant mediator between ECO and GPB. Another group of researchers focused on green purchase intention (GPI; Punyatoya, 2015; Limbu *et al.*, 2012; Leonidou *et al.*, 2011) as a key mediator between ECO and GPB. However, significant numbers of researchers agree that PCE, GPA and GPI have a significant influence on GRB (Khare, 2015; Roy, 2013; Singh and Pandey, 2012; Steg and Vlek, 2009), which leads to GPB.

The rest of the paper is organized as follows. In the next section, we develop our theoretical framework and further outline the constructs. In subsequent sections, we develop a hypothesized model and our research hypotheses, describe the construct operationalization and data collection method and present the data analysis procedure and the results of the model testing. This paper finally concludes with a discussion about our findings and directions for future research.

## 2. Theoretical framing

With progress of efforts over half a century, the theoretical foundation of consumer attitude and behaviour studies from the field of social psychological research has an origin in the consumer value expectancy behaviour model, which was then further developed to the



**Figure 1.**  
Theoretical  
framework

theory of reasoned action (TRA) and finally to the theory of planned behaviour (TPB) (Rosenberg, 1956; Fishbein, 1963; Ajzen and Fishbein, 1980; Ajzen, 1985, 1991 cited in Kalafatis *et al.*, 1999). Several critical reviews and meta-analyses have been carried out based on these multi-attribute models and have since long dominated the efforts to predict social behaviours. The approaches have enjoyed a lot of popularity in consumer research, be it product purchase, store selection, social consumption or waste-recycling behaviour (Davies *et al.*, 2002). Critique by Davies *et al.* (2002) brings out important points – specific attitude determines specific behaviour, theories do not account for non-attitudinal personal and situational factors and degree of formation of intention mediates attitude–behaviour relationship. Pro-environmental behaviours, whether GRB or GPB, can be explained with the help of Schwartz’s altruistic behaviour model, having an origin in derived shared social norms, which are also called as personally adopted social norms. The distinguishing characteristic of shared social norms is that the consequence of upholding or violating these norms is linked with one’s self-concept, which makes altruism logical, although products are costlier than counterparts (Schwartz, 1970 as cited in Davies *et al.*, 2002). Thus, though TRA does not contain a theory for relative importance of attitudinal and social norms, Schwartz’s model does.

*2.1 Environmental consciousness*

ECO refers to psychological factors that determine individuals’ propensity towards pro-environmental behaviours (Zelezny and Schultz, 2000). With its origin in the 60s in the West, ECO was evident among individuals of a group who refrained from purchasing certain goods because of their environmentally hazardous by-products (Grunert and Juhl, 1995). This attitude took root over a period and consumers became sensitive to the extent of refraining from purchasing environmentally harmful products. This influenced firms to commit to production of green products (Pudaruth *et al.*, 2015; Sharma and Bansal, 2013; Huang and Kung, 2011; Connell, 2011; Buysse and Verbeke, 2003). ECO is a multidimensional construct known to influence a person’s knowledge, attitude, behaviour, intentions and actions. Researchers have studied the affective dimension (Singh and Gupta,

2013; Dunlap *et al.*, 2002; van Liere and Dunlap 1981) as well as the dispositional and cognitive dimensions of ECO (Matthew, 2013; Singh and Gupta, 2013). This study chooses to focus on the affective dimension.

### 2.2 Green purchase attitude

An important mediator between ECO and GPB, GPA is the result of likes and dislikes of customers and has a bearing on the willingness of the customer to buy a product with due consideration to environmental protection (Chyong *et al.*, 2006; Tanner and Kast, 2003). The theory dealing with attitude suggests that it is built through social interaction. GPA has been found to be the resultant blend of ECO, knowledge and social norms (Klaus *et al.*, 2014) with foundation in the long-standing value–attitude–behaviour theory (Shim, *et al.*, 1999; Homer and Kahle, 1988). GPA links to personal values, viz., collectivism, and these links have been well proven empirically (Thøgersen and Zhou, 2010; Aertsens *et al.*, 2009; Krystallis *et al.*, 2008; Brunso *et al.*, 2004; Chan, 2001), eventually leading to GPB. Studies mainly explore the Western context; thus, many researchers have expressed the need to extend these studies to the remaining parts of the world to get a better understanding of the concept (Tung *et al.*, 2012; Chen, 2007; Chan and Lau, 2002).

### 2.3 Green purchase intention

TRA postulates that an individual's attitude generally influences the behaviour of a person (Limbu *et al.*, 2012; Leonidou *et al.*, 2011; Jin and Suh, 2005; Ajzen and Fishbein, 1980), but it is mediated by intention. Thus, a person's favourable attitude towards a brand triggers purchase intention, mediating positive intention results in purchase of a product or service, whereas negative intention reduces the chances of purchase (Punyatoya, 2015). Consumers today are better aware of environmental issues because of environment-friendly strategies of government-nominated regulatory bodies (Jain and Kaur, 2004) and media-triggered awareness about environmental hazards, thinning of the ozone layer, global warming, acid rains, etc. (Leonidou *et al.*, 2011). Social influences on going green are stronger round the globe (Cheah and Phau, 2011), resulting into increased inclination towards green products and rising green consumerism (Peattie, 2001).

### 2.4 Perceived customer effectiveness

Kinnear *et al.* (1974) define PCE as a measurement of the belief of people that their green actions will result into environmental protection. As the research progressed, *locus* of control (LOC) was attached to PCE, defining how people think about controlling events affecting them (Rotter, 1966). If the LOC is external, the person is influenced by the acquaintances, and if the LOC is internal, the person is not affected by his/her acquaintances (Joonas, 2008; Ozmete, 2007). PCE has been used as a personal characteristic indicative of the environmental concern of an individual by some researchers (Kim and Choi, 2005; Balderjahn, 1988; Kinnear *et al.*, 1974). Research has shown that higher PCE would mean higher ECO (Tan, 2011). Individual or collective orientation of people also influences PCE (Kim and Choi, 2005; Grimm, *et al.*, 1999). Two different schools of thought emerge: the first claims that PCE is an important predictor of behaviour (Berger and Corbin, 1992; Kinnear *et al.*, 1974), whereas the second claims that PCE can moderate the relationship between attitude and behaviour (Tan, 2011; Laskova, 2007; Berger and Corbin, 1992; Webster, 1975). Research has also indicated that PCE is based on knowledge and shows direct and indirect influences (Kim and Choi, 2005).

### 2.5 Green behaviour

GRB, also referred to as pro-environmental behaviour, means a set of behaviours that minimizes harm to the environment through minimizing use of energy, reducing waste, conserving water, refraining from buying goods perceived to be hazardous to the environment, etc., holding true equally in the case of developed and developing countries (Steg and Vlek, 2009; Kollmuss and Agyeman, 2002). A number of factors contribute to an increase in GRB: general awareness about ecological and sustainability issues, heightened ECO and mainly the availability of green alternatives (Khare, 2015).

### 2.6 Green purchase behaviour

GRB need not necessarily end up into GPB, as indicated in the previous section. Studies carried out in collectivist societies have revealed that social influence, past green buying behaviour and environmental norms would influence purchase decisions (Lee, 2009; Chan, 2001). Studies have also revealed that lifestyle, values, norms and beliefs and green self-identity also influence GPB (Ahn *et al.*, 2012; Kim and Chung, 2011; Jansson *et al.*, 2010). TPB (Ajzen and Fishbein, 1980) very well explains GPB, stating that attitude, subjective norm and perceived behavioural control together influence purchasing intentions, which in turn influence purchasing behaviour. Research studies have, over a period, separately measured generalized GRB (Oskamp *et al.*, 1991; Pickett *et al.* 1993; Tracy and Oskamp, 1983) and GPB (Balderjahn, 1988; Bratt, 1999; Brooker, 1976; Coddington, 1993; Davis, 1993; Ottman, 1993; Reizenstein *et al.*, 1974; Roper Organization and Johnson Wax, 1990, 1992).

## 3. Hypothesized model

Various measures of pro-environmentalism such as eco-consciousness, environmental attitude, PCE, GPA and GPI have been found to be strongly associated, except in a few studies which differ with regard to GPI. Eco-consciousness is seen to translate well into behaviour and is positively correlated with attitude and PCE (Jain and Kaur, 2004; Allen and Ferrand, 1999; Bratt, 1999; Shrum *et al.*, 1995; Ellen, 1994; Gamba and Oskamp, 1994; Ellen *et al.*, 1991). PCE is further seen to be positively correlated with attitude and behaviour (Majláth, 2010; Minton and Rose, 1997; Roberts, 1996; Berger and Corbin, 1992; Ellen *et al.*, 1991). Attitude, intention and behaviour studies related to environment range from energy conservation (Paladino and Baggiere, 2008), to recycling (McCarty and Shrum, 1994), to environmental activism (Kilbourne and Pickett, 2008). Though exhaustively researched, all these measures have been criticized as being complex and difficult to measure and implement (Kilbourne and Pickett, 2008; Chan, 2001; Balderjahn, 1988).

While TPB plays an important role in understanding GPB, many researchers have accounted that GPB is greatly influenced by personal norms too (Moser, 2015; Ha and Janda, 2012; Thøgersen and Ölander, 2006). Moser (2015) through his study obtained a surprising outcome that GPA did not influence GPB, and instead, willingness to pay was a stronger predictor of GPB. All these studies indicate that there is immense scope to further explore the determinants of GPB in an Indian setting. One of the explanations suggests that customers' willingness to buy green products particularly may be dampened by the cost, poor quality and non-availability of green products, resulting into purchase of non-green products (Roy, 2013; Singh and Pandey, 2012). Again, there is a need to research further to seek empirical evidence. Following previous arguments, we propose a theoretical framework as shown in Figure 1.

We have drawn testable hypotheses from Figure 1 as:

- 
- H1.* Environmental consciousness of customers has a positive influence on green purchase attitude.
  - H2.* Environmental consciousness of customers has a positive influence on perceived customer effectiveness.
  - H3.* Environmental consciousness of customers has a positive influence on green purchase intention.
  - H4.* Green purchase attitude of customers has a positive influence on perceived customer effectiveness.
  - H5.* Green purchase intention of customers has a positive influence on perceived customer effectiveness.
  - H6.* Green purchase attitude of customers has positive influence on green behaviour.
  - H7.* Green purchase attitude of customers has a positive influence on green purchase behaviour.
  - H8.* Perceived customer effectiveness of customers has a positive influence on green behaviour.
  - H9.* Perceived customer effectiveness of customers has a positive influence on green purchase behaviour.
  - H10.* Green purchase intention of customers has a positive influence on green behaviour.
  - H11.* Green purchase intention of customers has a positive influence on green purchase behaviour.
  - H12.* Green behaviour of customers has a positive influence on green purchase behaviour.

## 4. Research methods

### 4.1 Construct operationalization

We used the survey method to test our theoretical model. A survey instrument was developed by identifying suitable measurements from a comprehensive literature review. Some modifications were made to the existing scale to make those more suitable in context to our study. All constructs are operationalized as reflective constructs, as discussed next in [Table I](#).

### 4.2 Sampling design and data collection

The strong foundation of the current research is a two-stage random sampling method inspired from a census study in India. The first stage was random selection of blocks with, on average, 100 households for one of the 20 geo-clusters of Nashik, Maharashtra, India, followed by schedule listing using the north-west rule. The schedule included the basic sociodemographic information and two questions asking respondents if they thought environmental degradation was a problem and about awareness of green products.

The second stage of sampling included randomly drawing 25 households from each schedule listed block, proportionately representing each stratum, with the help of random number tables. Personal interview method was an obvious choice considering the length of



the questionnaire and criticality of making observations whenever possible as a cross-check of responses given by respondents. However, missing final directive on deciding the lower bound for sample size in structural equation modelling (SEM) to date being a non-linear function, some researches attempt to guide the fixation of lower bounds (Westland, 2010). Thumb rule proposed by Nunnally (1967 cited in Westland, 2010) guides most of the research studies in SEM, suggesting a sample size at least ten times the number of variables be used. However, most of the researchers claim that a sample size above 200 should be adequate for SEM analysis for number of indicators in the range of 15 to 20 (Punyatoya, 2015; Rahbar and Wahid, 2011); thus, the sample size chosen in this research, 500, is adequate enough (508 filled responses were received; among which, eight were defective, and hence discarded). The data were collected with the help of a self-administered structured questionnaire having three distinct components. The first part pertained to the demographics of the respondents, the second part involved the quantitative five-point Likert scale-based questions and the third part involved qualitative questions. A short summary of the purpose of this research and the confidentiality statement were given at the beginning of the questionnaire. Demographics given in Table II indicate fair distribution across cross sections of the society, closely representing census reports.

5. Data analysis

We have used the partial least squares (PLS) approach to SEM to test our model and research hypotheses. PLS-SEM is a second-generational analytic technique, which is considered more efficient than conventional methods, where principal component analysis and regression analysis are run simultaneously, making it a preferred choice. The advantage comes with the fact that PLS-SEM in the process of establishing cause-effect relationships among research constructs avoids multi-collinearity and measurement errors. Moreover, among two approaches of covariance- and PLS-based, the covariance-based approach burdens research with the need for a larger sample. PLS path modelling (PLS-SEMM) with the component-based approach empowers the prediction-oriented discovery process with no assumption requirement in relation to either population or scale of measurement (Fornell and Bookstein, 1982). The fact that formative and reflective indicators can be used in the model in the case of PLS helps the technique score over AMOS and LISREL (Fornell and Bookstein, 1982). The current study used SmartPLS® software for PLS.

5.1 Measurement model

The measurement model deals with reliability and validity issues. Internal consistency reliability measure, item reliability measure and composite reliability measures together were considered to verify reliability of latent variables (Table III). The alpha coefficients are of acceptable value (> or = 0.5), even though they are not on the higher side of acceptability. As evident from Table IV, the resultant item reliability measured as standardized factor

Table I.  
Construct  
operationalization

Construct	Source
Environmental consciousness	Dunlap <i>et al.</i> (2002); Mostafa (2007)
Green purchase attitude	Taylor and Todd (1995); Chan (2001); Mostafa (2007)
Perceived customer effectiveness	Ellen <i>et al.</i> (1991); Straughan and Roberts (1999); Majláth (2010)
Green behaviour	Greendex Survey (2012)
Green purchase behaviour	Kumar (2012)

			Dynamics of environmental consciousness
Attributes	Frequency	(%)	
<i>Gender</i>			689
Male	326	65.2	
Female	174	34.8	
<i>Age</i>			
<25 years	64	12.8	
25-35 years	148	29.6	
35-45 years	134	26.8	
45-55 years	98	19.6	
>55 years	56	11.2	
<i>Educational qualification</i>			
Diploma	147	29.4	
Graduate	246	49.2	
Postgraduate	93	18.6	
Others	14	2.8	
<i>Income per month</i>			
Less than Rs. 20,000 (approx. US\$315)	52	10.4	
Rs. 20,000 to Rs. 30,000 (approx. US\$315-470)	126	25.2	
Rs. 30,000 to Rs. 40,000 (approx. US\$470-630)	178	35.6	
Rs. 40,000 to Rs. 50,000 (approx. US\$630-786)	73	14.6	
Rs. 50,000 to Rs. 75,000 (approx. US\$786-1180)	36	7.2	
Rs. 75,000 to Rs. 1,00,000 (approx. US\$1180-1573)	21	4.2	
Above Rs. 1,00,000 (approx. US\$1573)	14	2.8	
<i>Experience in buying goods/services</i>			
<2 years	73	14.6	
2-5 years	221	44.2	
5-10 years	148	29.6	
>10 years	58	11.6	

Table II.  
Demographic details of the sample

Constructs	AVE	Composite reliability	R-square	Cronbach's alpha	Communality	Table III. Reliability and validity
ECO	0.3976	0.7230	0	0.4874	0.3976	
GRB	0.5033	0.7524	0.1282	0.5068	0.5033	
GPA	0.4936	0.7445	0.0789	0.4969	0.4936	
GPB	0.6996	0.8228	0.3736	0.5761	0.6996	
GPI	0.5166	0.7608	0.0046	0.5422	0.5166	
PCE	0.3854	0.7131	0.4081	0.4826	0.3854	

loading ranges from 0.6 to 0.8. The *R*-square value (Table III), an indication of the percentage of influence of the independent variables on dependent variables, is acceptable (>10 per cent) for all the variables except GPI. The composite reliability estimate ranging from 0.7 to 0.8 indicates higher reliability. The convergent validity test based on factor loading and composite reliability test indicates moderate to high acceptable range of factor loading for all items, suggesting good composite reliabilities in general. Factor loadings above 0.5 are considered in most of the analyses of this nature, and hence, after factor reduction, the loadings above 0.6 are considered for further analysis, which range from 0.6 to 0.8.



**Table IV.**  
Factor loading after  
reduction

Indicators	ECO	GRB	GPA	GPB	GPI	PCE
ECO11	0.5608					
ECO13	0.7060					
ECO15	0.6374					
ECO5	0.6436					
GRB1		0.6986				
GRB2		0.7055				
GRB3		0.7237				
GPA1			0.6800			
GPA2			0.6696			
GPA3			0.7556			
GPB1				0.8326		
GPB2				0.8434		
GPI1					0.7067	
GPI2					0.6441	
GPI3					0.7971	
PCE1						0.6033
PCE2						0.6075
PCE3						0.7072
PCE4						0.5576

Critical test of discriminant validity was carried out by estimating square root of average variance extracted (AVE) for each construct is greater compared with correlation between constructs (Table V), thus indicating acceptable discriminant validity. Even though Cronbach alpha reliability in this study is relatively lower, considering the fact that it is merely the measure of internal consistency, based on rest of the measures, reliability and validity are considered adequate and acceptable.

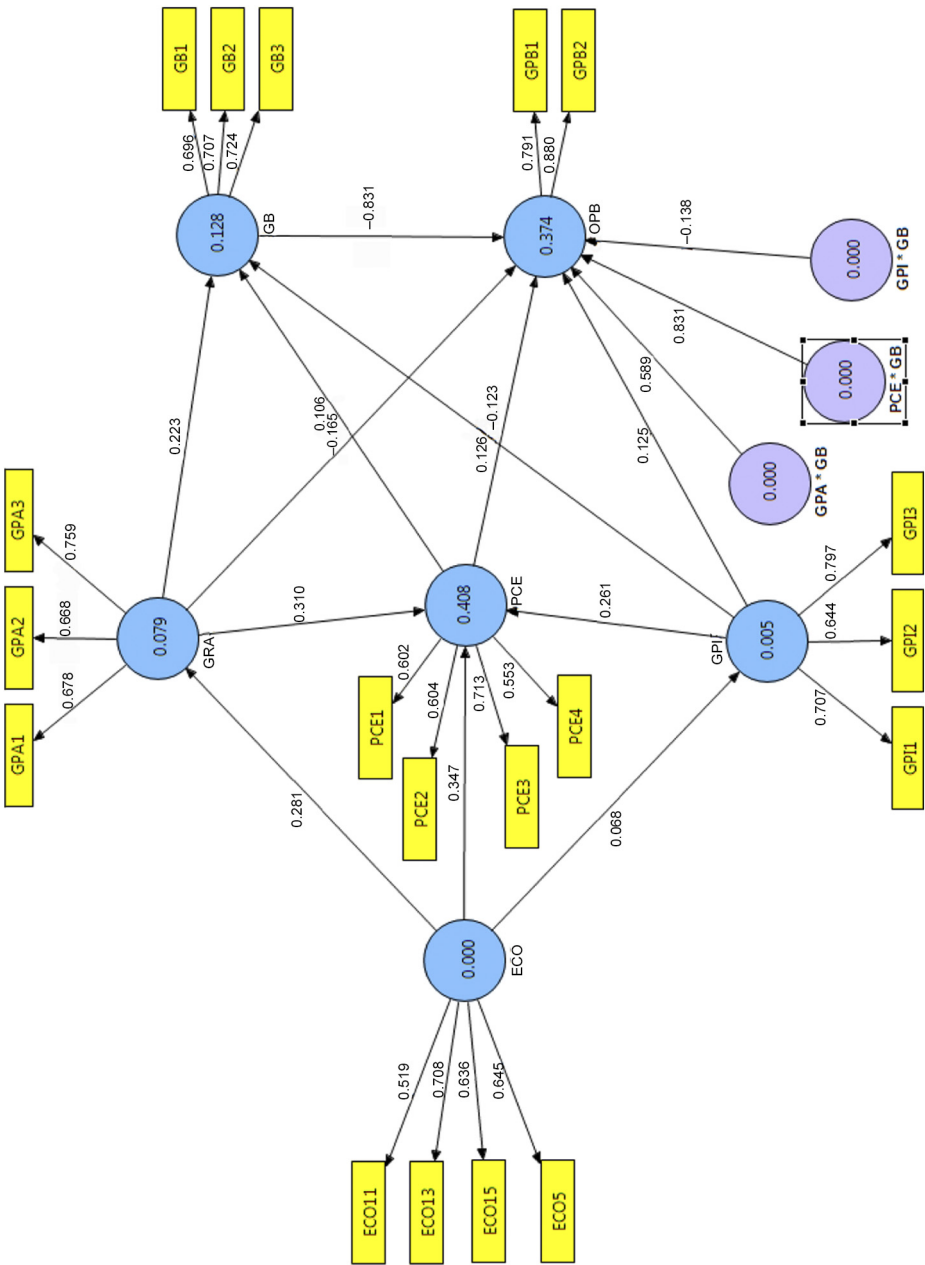
5.2 Hypothesis testing

The hypothesized model consists of six latent constructs designed to test 12 hypotheses postulated based on meta-analyses carried out for the current research (Figures 1 and 2). Items were combined as seen in the model on the basis of an iterative process of testing carried out for the convergent and discriminant validity of the model. Figure 2 depicts the hypothesized model with coefficient and explanatory power ( $R^2$ ) for each of the dependent constructs. While path coefficients are indicative of the strength of the relationship among the latent variables,  $t$ -values (Table VI) are indicative of the significance of the relationship, enabling the process of hypothesis testing as seen in Figure 3.

**Table V.**  
AVE square roots  
and inter-correlation

Constructs	ECO	GRB	GPA	GPB	GPI	PCE
ECO	<i>0.6305</i>					
GRB	0.1131	<i>0.7094</i>				
GPA	0.2828	0.3151	<i>0.7028</i>			
GPB	0.4156	0.0761	0.4197	<i>0.8380</i>		
GPI	0.0591	0.2365	0.3145	0.2281	<i>0.7187</i>	
PCE	0.4627	0.2661	0.4888	0.5139	0.3838	<i>0.6213</i>

**Note:** Alpha level = 0.05; italics represent square root of AVE

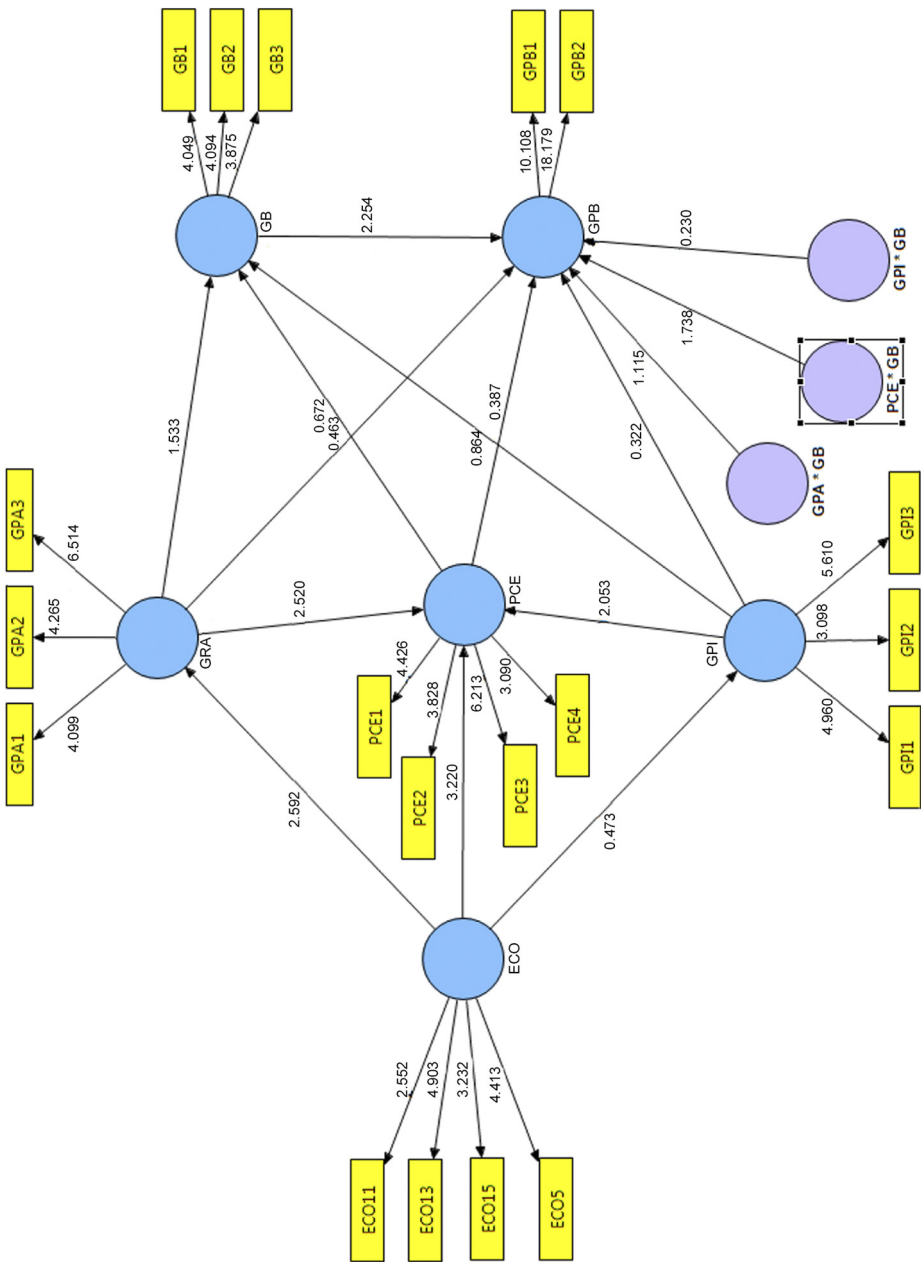


**Figure 2.**  
Factor loadings and  
path coefficients

Table VI.  
Hypothesis test

Hypothesis	Original sample (O)	Sample mean (M)	SD (STDEV)	Standard error (STERR)	T statistics ( O/STERR )	Hypothesis testing
ECO > GPA (H1)	0.2809	0.3105	0.1083	0.1083	2.5923*	<i>Supported</i>
ECO > PCE (H2)	0.4516	0.4662	0.107	0.107	4.2207*	<i>Supported</i>
ECO > GPI (H3)	0.068	0.0834	0.1435	0.1435	0.4734	Unsupported
GPA > PCE (H4)	0.3102	0.3008	0.1231	0.1231	2.5204*	<i>Supported</i>
GPI > PCE (H5)	0.2609	0.2711	0.127	0.127	2.0546*	<i>Supported</i>
GPA > GRB (H6)	0.2562	0.2714	0.132	0.132	1.9418**	<i>Supported</i>
GPA > GPB (H7)	-0.4162	-0.1588	0.3958	0.3958	1.0515	Unsupported
PCE > GRB (H8)	0.1062	0.1242	0.1581	0.1581	0.6721	Unsupported
PCE > GPB (H9)	-0.2111	-0.1329	0.3416	0.3416	0.618	Unsupported
GPI > GRB (H10)	0.1537	0.1587	0.1366	0.1366	1.1253	Unsupported
GPI > GPB (H11)	-0.0351	-0.0212	0.4074	0.4074	0.0862	Unsupported
GRB > GPB (H12)	-0.8312	-0.5966	0.3687	0.3687	2.2544*	<i>Supported</i>

Notes: Significance level: \* = 1 %; \*\* = 5%; italics represent hypothesis supported



**Figure 3.**  
The *t*-values of the  
model

## 6. Discussions

ECO of customers has a significant influence on GPA (*H1*), as discussed in line with earlier studies (DiPietro and Gregory, 2012; Hu *et al.*, 2010) which indicate that customers who are eco-conscious (personally utilize green practices and initiatives such as recycling, minimization of waste, etc.) are more likely to patronize green purchases.

It was revealed that ECO of customers has a significant influence on PCE (*H2*). Conscious effort is demanded of customer to make green purchase decisions. So, PCE has to support ECO of the customer to result in GPB, as is revealed in other similar studies (Tan, 2011; Laskova, 2007; Kim and Choi, 2005).

Surprisingly, ECO of customers had no significant influence on GPI (*H3*). One can very well predict behaviour on the basis of intention. Against this general notion, the study carried out by Kuhl and Beckman (1985) suggests a weak link between cognition and behaviour than expected. They proved that one's behaviour may not be consistent with one's beliefs, values, attitudes or intentions. This supports the rejection of the hypothesis stating that ECO significantly influences GPI of customers.

GPA of customers has a significant influence on PCE (*H4*). Many researchers including Antil (1984), Berger and Corbin (1992), Roberts (1996) and Majláth (2010) proved that attitude and response to messages received from one's surroundings are a function of one's belief that he/she has the ability to positively contribute towards protection of the environment. Mixed results suggest positive as well as negative relationships between GPA and PCE (Arbuthnot, 1977; Kellgren and Wood, 1986). Whereas, others suggest weak relationships between these variables (Webster, 1975; Mainieri *et al.*, 1997; and Tanner and Kast, 2003).

GPI has a significant influence on PCE (*H5*). GPI is strongly supported by pro-environmental attitude, environmental knowledge-awareness and even environmental concern. GPI and PCE are different constructs and usually GPA is known to influence PCE, as observed by Chan (2001). However, this research reveals the fact that GPI makes the customers perceive that they are effective contributors to pollution mitigation and environmental degradation minimization; thus, the hypothesis stands supported.

GPA has a significant influence on GRB (*H6*). It is human nature to evaluate everything on the basis of some degree of inclination favouring or disfavouring (Eagly and Chaiken, 1993) influencing an individual's purchase behaviour. GPA has been significantly related to general GRB, as is evident through various environmental studies (Straughan and Roberts, 1999; Kim and Choi, 2003; Lopez and Cuervo-Arango, 2008; Tan and Lau, 2011), as well as with GPB (Aoyagi-Usui, 2001; Kim and Choi, 2005; Tilikidou, 2007) and green apparel purchasing behaviour (Shim, 1995; Butler and Francis, 1997).

GPA has no significant influence on GPB (*H7*), as revealed through hypothesis testing. An interesting perspective brought forth with this research indicates that GPA has a significant influence on GRB but not on GPB. This implies that GRB need not necessarily end up into GPB, even though both are causally linked to GPA. Green gap between attitude and behaviour is an observation since long in social sciences, reasons being personal, frequency and habits of past behaviour, personal benefit domination or lack of trust (Gleim *et al.*, 2013; Mittal, 1998; Ouellette and Wood, 1998; Verplanken *et al.*, 1997); market and situational; or non-availability, inadequate promotional strategies of green as compared to conventional products, costliness or aesthetics issues (Punyatoya, 2015; Gleim and Lawson, 2014; Tang *et al.*, 2014; Solomon *et al.*, 2010; Blackwell *et al.*, 2006).

PCE has no significant influence on GRB (*H8*), as revealed through hypothesis testing. This result contrasts with the research undertaken by Kim (2005). As the study was undertaken in a different location with change in beliefs, culture and social setting, variance

is possible. PCE, a complex variable, is the result of self-evaluation exercise of analysing ability to contribute towards solutions of the issue (Ellen *et al.*, 1991; Berger and Corbin, 1992). Further, to make things more complicated, an alternative argument poses a debate that individualistic–collectivistic orientations impact PCE, where individuals within a culture may also differ in their value orientation (Kim, 2005). So, there is always a possibility that PCE need not necessarily have a significant influence on GRB.

PCE of customers has no significant influence on GPB (*H9*). The finding is in contrast to the research findings of a group of researchers who claimed influence of PCE over GRB, recycling, use of energy-efficient products and GPB (Vermeir and Verbeke, 2006; Verhoef 2005; Kim and Choi, 2005; Lee and Holden, 1996). It has been proven that GRB of customers has a significant influence on GPB (*H12*). It is also established through hypothesis testing that PCE has no influence on GRB (*H8*). So, it is obvious that PCE has no significant influence on GPB.

GPI has no significant influence on GRB (*H10*), as revealed through hypothesis testing. Kim (2005) opines that personal efficacy and behavioural intentions are better predictors of target behaviour in relation to the level of specificity of attitudes, behaviour or motivational factors. A large group of researchers have worked on the value–attitude–behaviour model (McCarty and Shrum, 1994; Follows and Jobber, 2000; Castaneda *et al.*, 2008; Singh and Gupta, 2013), but there is not much evidence supporting influence of GPI on GRB. Thus, GPI need not necessarily result in GRB, as revealed through current research. Further, GPI of customers has no significant influence on GPB (*H11*). Again, as discussed before, GRB and GPB are positively related; hence, the above argument also holds true for GPI.

The GRB of customers significantly influences GPB (*H12*). Earlier studies reveal the fact that GRB (pro-environmental behaviour) indirectly influences GPB through GPA (Kim and Choi, 2003). Meta-analyses also reveal a significant relationship between GRB and GPB (Soutar *et al.*, 1994; Follows and Jobber, 2000; Mat Said *et al.*, 2003; Haron *et al.*, 2005; Halpenny, 2006; Tilikidou, 2007).

## 7. Conclusions

Current research is an attempt to examine the influence of ECO of the customers on GPB empirically. GPA, GPI, PCE and GRB were the mediating variables between ECO and GPB. The study has provided empirical proof for the fact that ECO of the customer significantly influences GPA as well as PCE, but does not significantly influence GPI. Further, GPA and GPI significantly influence green purchase effectiveness. The study brings forth an important fact that GPA significantly influences GRB, which in turn significantly influences GPB. This finding implicates that the government must initiate active measures in the form of creating awareness, introducing strict regulations on going green and encouraging green manufacture so that ECO of the customers can be increased. A lot of work is in progress to protect Mother Earth from unfriendly practices of manufacture and measures are being taken to protect the environment in all possible ways, and this study is an attempt to meaningfully add to the growing body of literature in this field. The study has also provided a theoretical model for ECO leading to GPB and also developed and validated a questionnaire that can be used by future researchers in studies on ECO.

Generalizability of the results can be considered as one of the main limitations of the study, as it was carried out in a particular state of India and results may not be considered as the perception of the country as a whole, even though it is thought to be a worthy representative sample. So, the study offers scope for collecting sample data from the entire country, so that the results can be generalized at the national level. The study is typically

focussed towards understanding the level of influence of ECO on GPB but does not analyse the linkage between behaviour and action. There is still a gap between behaviour and action, which may be studied as an extension of this work.

ECO has been gaining due importance in the past decade, and a lot of research is in progress round the globe on this vital issue which addresses sustainability. This research is a meaningful contribution to the body of knowledge in this area, bringing forth implications for the policymakers and the manufacturers to make both the customers and the manufacturers develop pro-environmental attitude, behaviour, intention and practice, as it establishes an empirical linkage between these variables.

At the same time, contemporary research has not successfully explained reasons for the gap between rates of translation of GPA into actual purchase of environment-friendly or green products (Gupta and Ogden, 2009).

The neo-classic economic theory explains GRB to a great extent. According to this theory, individuals have rational preferences, they try to maximize their outcomes and they act independently when full information is available (Kollmuss and Agyeman, 2002). The individuals look for the options that are available when it comes to purchase of goods or products. Among these options, they observe both environmentally friendly and environmentally hazardous options which are available. At the same time, they would like to maximize their outcomes in the purchase they make. So, based on all the information about the products that is available through all possible sources, they compare the choices they have in the list of the goods and the products. It is at this stage when their GRB prompts them to select the best of the options among the goods or products that would maximize their outcomes, and at the same time, do no or minimum damage to the environment. Hence, we conclude with the hope that our current study may attract the attention of scholars to advance the existing debates.

## References

- Aertsens, J., Verbeke, W., Mondelaers, K. and Van Huylenbroeck, G. (2009), "Personal determinants of organic food consumption: a review", *British Food Journal*, Vol. 111 No. 10, pp. 1140-1167.
- Ahn, J.M., Koo, D.M. and Chang, H.S. (2012), "Different impacts of normative influences on proenvironmental purchasing behavior explained by differences in individual characteristics", *Journal of Global Scholars of Marketing Science: Bridging Asia and the World*, Vol. 22 No. 2, pp. 163-182.
- Ajzen, I. (1985), "From intentions to actions: a theory of planned behaviour", in Kuhl, J. and Beckmann, J. (Eds), *Action-Control: From Cognition to Behaviour*, Springer-Verlag, Heidelberg, pp. 11-39.
- Ajzen, I. (1991), "The theory of planned behaviour", *Organizational Behavior and the Human Decision Process*, Vol. 50 No. 2, pp. 179-211.
- Ajzen, I. and Fishbein, M. (1980), *Understanding Attitudes and Predicting Social Behavior*, Prentice-Hall, Englewood Cliffs, NJ.
- Allen, J.B. and Ferrand, L.J. (1999), "Environmental locus of control, sympathy and pro-environmental behaviour: a test of Geller's actively caring hypothesis", *Environment and Behavior*, Vol. 31 No. 3, pp. 338-353.
- Antil, J.H. (1984), "Socially responsible consumers: profile and implications for public policy", *Journal of Macromarketing*, Vol. 4 No. 2, pp. 18-39.
- Aoyagi-Usui, M. (2001), "How individual values affect green consumer behavior? Results from a Japanese survey", *Global Environment Research*, Vol. 5 No. 1, pp. 97-105.



- Arbuthnot, J. (1977), "The roles of attitudinal and personality variables in the prediction of environmental behavior and knowledge", *Environment and Behavior*, Vol. 9 No. 2, pp. 217-232.
- Balderjahn, I. (1988), "Personality variables and environmental attitudes as predictors of ecologically responsible consumption patterns", *Journal of Business Research*, Vol. 17 No. 1, pp. 51-56.
- Bazan, E., Jaber, M.Y. and Zaroni, S. (2017), "Carbon emissions and energy effects on a two-level manufacturer-retailer closed-loop supply chain model with remanufacturing subject to different coordination mechanisms", *International Journal of Production Economics*, Vol. 183, pp. 394-408.
- Berger, I.E. and Corbin, R.M. (1992), "Perceived consumer effectiveness and faith in others as moderators of environmentally responsible behaviors", *Journal of Public Policy and Marketing*, Vol. 11 No. 2, pp. 79-89.
- Bhattacharya, A., Dey, P.K. and Ho, W. (2015), "Green manufacturing supply chain design and operations decision support", *International Journal of Production Research*, Vol. 53 No. 21, pp. 6339-6343.
- Blackwell, R.D., Miniard, P.W. and Engel, J.F. (2006), *Consumer Behavior*, 10th ed., Thomson Higher Education, Mason.
- Bord, R.J., O'Connor, R.E. and Fisher, A. (2000), "In what sense does the public need to understand global climate change?", *Public Understanding of Science*, Vol. 9 No. 3, pp. 205-218.
- Bratt, C. (1999), "Consumers' environmental behaviour: generalised, sector-based, or compensatory?", *Environment and Behavior*, Vol. 31 No. 1, pp. 28-34.
- Brooker, G. (1976), "The self-actualizing socially conscious consumer", *Journal of Consumer Research*, Vol. 3 No. 2, pp. 107-112.
- Brunso, K., Scholderer, J. and Grunert, K.G. (2004), "Testing relationships between values and food-related lifestyle: results from two European countries", *Appetite*, Vol. 43 No. 2, pp. 195-205.
- Butler, S.M. and Francis, S. (1997), "The effects of environmental attitudes on apparel purchasing behavior", *Clothing and Textiles Research Journal*, Vol. 15 No. 2, pp. 76-85.
- Buysse, K. and Verbeke, A. (2003), "Proactive environmental strategies: a stakeholder management perspective", *Strategic Management Journal*, Vol. 24 No. 5, pp. 453-470.
- Castaneda, J.A., Rodriguez, M.A. and Luque, T. (2008), "Attitudes' hierarchy of effects in online user behavior", *Online Information Review*, Vol. 33 No. 1, pp. 7-21.
- Chan, R.Y. (2001), "Determinants of Chinese consumers – green purchase behaviour", *Psychology and Marketing*, Vol. 18 No. 4, pp. 389-413.
- Chan, R.Y.K. and Lau, L.B.Y. (2002), "Explaining green purchasing behavior: a cross-culture country study on American and Chinese consumers", *Journal of International Consumer Marketing*, Vol. 14 Nos 2/3, pp. 9-40.
- Cheah, I. and Phau, I. (2011), "Attitude towards environment friendly products: the influence of ecoliteracy, interpersonal influence and value orientation", *Marketing Intelligence and Planning*, Vol. 29 No. 5, pp. 452-472.
- Chen, M.-F. (2007), "Consumer attitudes and purchase intentions in relation to organic foods in Taiwan: moderating effects of food-related personality traits", *Food Quality and Preference*, Vol. 18 No. 7, pp. 1008-1021.
- Chyong, H.T., Phang, G., Hasan, H. and Buncha, M.R. (2006), "Going green: a study of consumers' willingness to pay for green products in Kota Kinabalu", *International Journal of Business and Society*, Vol. 7 No. 2, pp. 40-54.
- Coddington, W. (1993), *Environmental Marketing: Positive Strategies for Reaching Green Consumers*, McGraw-Hill, New York, NY.
- Connell, H.K.Y. (2011), "Exploring consumers' perceptions of eco-conscious apparel acquisition behaviors", *Social Responsibility Journal*, Vol. 7 No. 1, pp. 61-73.

- Davis, F.D. (1993), "User acceptance of information technology: system characteristics, user perceptions and behavioral impacts", *International Journal of Man-Machine Studies*, Vol. 38 No. 3, pp. 475-487.
- Davies, J., Foxall, G.R. and Pallister, J. (2002), "Beyond the intention-behaviour mythology: an integrated model of recycling", *Marketing Theory*, Vol. 2 No. 1, pp. 29-113.
- Deif, A.M. (2011), "A system model for green manufacturing", *Journal of Cleaner Production*, Vol. 19 No. 4, pp. 1553-1559.
- DiPietro, R.B. and Gregory, S. (2012), "Customer perceptions regarding green restaurant practices: a comparison between fast food and upscale casual restaurants", *FIU Hospitality Review*, Vol. 30 No. 1, pp. 1-22.
- Du, S., Tang, W. and Song, M. (2016), "Low-carbon production with low-carbon premium in cap-and-trade regulation", *Journal of Cleaner Production*, Vol. 134, pp. 652-662.
- Dunlap, R.E. (2002), "An enduring concern, Public Perspective", available at: [www.PublicPerspective.org](http://www.PublicPerspective.org) (accessed on 21 June, 2015).
- Eagly, A. and Chaiken, S. (1993), *The Psychology of Attitudes*, Harcourt Brace Jovanovich, New York, NY.
- Ellen, P.S. (1994), "Do we know what we need to know? Objective and subjective knowledge effects on pro- ecological behaviours", *Journal of Business Research*, Vol. 30 No. 1, pp. 43-52.
- Ellen, P.S., Wiener, J.L. and Cobb-Walgren, C. (1991), "The role of perceived consumer effectiveness in motivating environmentally conscious behaviors", *Journal of Public Policy and Marketing*, Vol. 10 No. 2, pp. 102-117.
- Fishbein, M. (1963), "An investigation of the relationships between beliefs about an object and the attitude toward that object", *Human Relations*, Vol. 16 No. 3, pp. 233-234.
- Follows, S.B. and Jobber, D. (2000), "Environmentally responsible purchase behavior: a test of a consumer model", *European Journal of Marketing*, Vol. 34 Nos 5/6, pp. 723-746.
- Fornell, C. and Bookstein, F.L. (1982), "Two structural equation models: LISREL and PLS applied to consumer exit-voice theory", *Journal of Marketing Research*, Vol. 19 No. 4, pp. 440-452.
- Gamba, R. and Oskamp, S. (1994), "Factors influencing community residents participation in commingled curbside recycling programs", *Environment and Behavior*, Vol. 26 No. 5, pp. 587-612.
- Gleim, M. and Lawson, S.J. (2014), "Spanning the gap: an examination of the factors leading to the green gap", *Journal of Consumer Marketing*, Vol. 31 Nos 6/7, pp. 503-514.
- Gleim, M.R., Smith, J.S., Andrews, D. and Cronin, J.J. (2013), "Against the green: a multi-method examination of the barriers to green consumption", *Journal of Retailing*, Vol. 89 No. 1, pp. 44-61.
- Greendex Survey (2012), available at: <http://environment.nationalgeographic.com/environment/greendex/2012-survey/> (accessed 21 July, 2014).
- Grimm, S.D., Church, A.T., Katigbak, M.S. and Reyes, J.A.A. (1999), "Self-described traits, values, and moods associated with individualism and collectivism: testing I-C theory in an individualistic (US) and a collectivistic (Philippine) culture", *Journal of Cross- Cultural Psychology*, Vol. 30 No. 4, pp. 466-500.
- Grunert, S. and Juhl, H. (1995), "Values, environmental attitudes, and buying of organic foods", *Journal of Economic Psychology*, Vol. 16 No. 1, pp. 39-62.
- Gupta, S. and Ogden, D.T. (2009), "To buy or not to buy? A social dilemma perspective on green buying", *Journal of Consumer Marketing*, Vol. 26 No. 6, pp. 376-391.
- Gutowski, T., Murphy, C., Allen, D., Bauer, D., Bras, B., Piwonka, T., Sheng, P., Sutherland, J., Thurston, D. and Wolff, E. (2005), "Environmentally benign manufacturing: observations from Japan, Europe and the United States", *Journal of Cleaner Production*, Vol. 13 No. 1, pp. 1-17.

- 
- Ha, H.Y. and Janda, S. (2012), "Predicting consumer intentions to purchase energy-efficient products", *Journal of Consumer Marketing*, Vol. 29 No. 7, pp. 461-469.
- Halpenny, E.H. (2006), "Examining the relationship of place attachment with pro-environmental intentions", *Proceedings of the 2006 Northeastern Recreation Research Symposium*, Bolton Landing, New York, NY.
- Harik, R., El Hachem, W., Medini, K. and Bernard, A. (2015), "Towards a holistic sustainability index for measuring sustainability of manufacturing companies", *International Journal of Production Research*, Vol. 53 No. 13, pp. 4117-4139.
- Haron, S.A., Paim, L. and Yahaya, N. (2005), "Towards sustainable consumption: an examination of environmental knowledge among Malaysians", *International Journal of Consumer Studies*, Vol. 29 No. 5, pp. 426-436.
- Homer, P.M. and Kahle, L.R. (1988), "A structural equation test of the value-attitude behaviour hierarchy", *Journal of Personality and Social Psychology*, Vol. 54 No. 4, pp. 638-646.
- Hsu, J.L. and Lin, T. (2015), "Carbon reduction knowledge and environmental consciousness in Taiwan", *Management of Environmental Quality: An International Journal*, Vol. 26 No. 1, pp. 37-52, available at: [www.allacademic.com/meta/p111527\\_index.html](http://www.allacademic.com/meta/p111527_index.html)
- Hu, H.H., Parsa, H.G. and Self, J. (2010), "The dynamics of green restaurant patronage", *Cornell Hospitality Quarterly*, Vol. 51 No. 3, pp. 344-362.
- Huang, C. and Kung, F. (2011), "Environmental consciousness and intellectual capital management: evidence from Taiwan's manufacturing industry", *Management Decision*, Vol. 49 No. 9, pp. 1405-1425.
- Jain, S.K. and Kaur, G. (2004), "Green marketing: an Indian perspective", *Decision*, Vol. 31 No. 2, pp. 168-209.
- Jansson, J., Marell, A. and Nordlund, A. (2010), "Green consumer behavior: determinants of curtailment and eco-innovation adoption", *Journal of Consumer Marketing*, Vol. 27 No. 4, pp. 358-370.
- Jin, B. and Suh, Y.G. (2005), "Integrating effect of consumer perception factors in predicting private brand purchase in a Korean discount store context", *Journal of Consumer Marketing*, Vol. 22 No. 2, pp. 62-71.
- Jones, S.F.I. (2014), "The cost of carbon management using ocean nourishment", *International Journal of Climate Change Strategies and Management*, Vol. 6 No. 4, pp. 391-400.
- Joonas, K. (2008), "Environmentally friendly products: factors affecting search for information", *AIMS, International Journal of Management*, Vol. 2 No. 3, pp. 165-176.
- Kalafatis, S.P., Pollard, M., East, R. and Tsogas, M. (1999), "Green marketing and Ajzen's theory of planned behaviour: a cross-market examination", *Journal of Consumer Marketing*, Vol. 16 No. 5, pp. 441-460.
- Kapetanopoulou, P. and Tagaras, G. (2011), "Drivers and obstacles of product recovery activities in the Greek industry", *International Journal of Operations & Production Management*, Vol. 31 No. 2, pp. 148-166.
- Kellgren, C.A. and Wood, W. (1986), "Access to attitude relevant information in memory as a determinant of attitude-behavior consistency", *Journal of Experimental Psychology*, Vol. 22 No. 4, pp. 328-338.
- Khare, A. (2015), "Antecedents to green buying behaviour: a study on consumers in an emerging economy", *Marketing Intelligence & Planning*, Vol. 33 No. 3, pp. 309-329.
- Kilbourne, W. and Pickett, G. (2008), "How materialism affects environmental beliefs, concerns, and environmentally responsible behavior", *Journal of Business Research*, Vol. 61 No. 9, pp. 885-893.
- Kim, H.Y. and Chung, J.E. (2011), "Consumer purchase intention for organic personal care products", *Journal of Consumer Marketing*, Vol. 28 No. 1, pp. 40-47.

- Kim, Y. and Choi, S.M. (2003), *Antecedents of Pro-Environmental Behaviors: An Examination of Cultural Values, Self-Efficacy, and Environmental Attitudes*, International Communication Association, Marriott Hotel.
- Kim, Y. and Choi, S.M. (2005), "Antecedents of green purchase behaviour: an examination of collectivism, environmental concern and PCE", *Advances in Consumer Research*, Vol. 32, pp. 592-559.
- Kinneas, T.C., Taylor, J.R. and Ahmed, S.A. (1974), "Ecologically concerned consumers: who are they?", *Journal of Marketing*, Vol. 38 No. 2, pp. 20-24, Cited in Tab, B. (2011), The Role of Perceived Consumer Effectiveness on Value-Attitude-Behaviour Model in Green Buying Behaviour Context, *Australian Journal of Basic and Applied Sciences*, Vol. 5 No.12, pp 1766-1771.
- Klaus, T.P., Athanasios, G.G., Yanfeng, K., Guang, Z. and Hue, H.Y. (2014), "Testing and validation of a hierarchical values-attitudes model in the context of green food in China", *Asia Pacific Journal of Marketing and Logistics*, Vol. 26 No. 2, pp. 296 -314.
- Kollmuss, A. and Agyeman, J. (2002), "Mind the gap: why do people act environmentally and what are the barriers to pro- environmental behavior?", *Environmental Education Research*, Vol. 8 No. 3, pp. 239-260.
- Krystallis, A., Vassallo, M., Chryssochoidis, G. and Perrea, T. (2008), "Societal and individualistic drivers as predictors of organic purchasing revealed through a portrait value questionnaire (PVQ)-based inventory", *Journal of Consumer Behaviour*, Vol. 7 No. 2, pp. 164-187.
- Kuhl, J. and Beckman, J., eds (1985), *Action Control: From Cognition to Behavior*, Springer Verlag, New York, NY.
- Kumar, B. (2012), *Theory of Planned Behaviour Approach to Understand the Purchasing Behaviour for Environmentally Sustainable Products*, Research and Publications, WP no. 2012-12-08, IIM, Ahmedabad.
- Laskova, A. (2007), "Perceived consumer effectiveness and environmental concerns", *Proceedings of the 13th Asia Pacific Management Conference, Melbourne*, pp. 206-209.
- Law, K.M.Y. and Gunasekaran, A. (2012), "Sustainability development in high-tech manufacturing firms in Hong Kong: motivators and readiness", *International Journal of Production Economics*, Vol. 137 No. 1, pp. 116-125.
- Lee, K. (2009), "Gender differences in Hong Kong adolescent consumers' green purchasing behaviour", *Journal of Consumer Marketing*, Vol. 26 No. 2, pp. 87-96.
- Lee, J.A. and Holden, S.J.S. (1996), "Understanding the determinants of environmentally conscious behavior", *Psychology and Marketing*, Vol. 16 No. 5, pp. 373-392.
- Leonidou, L.C., Leonidou, C.N., Paliawadana, D. and Hultman, M. (2011), "Evaluating the green advertising practices of international firms: a trend analysis", *International Marketing Review*, Vol. 28 No. 1, pp. 6-33.
- Li, K. and Lin, B. (2016), "Heterogeneity analysis of the effects of technology progress on carbon intensity in China", *International Journal of Climate Change Strategies and Management*, Vol. 8 No. 1, pp. 129-152.
- Limbu, Y.B., Wolf, M. and Lunsford, D. (2012), "Perceived ethics of online retailers and consumer behavioral intentions: the mediating roles of trust and attitude", *Journal of Research in Interactive Marketing*, Vol. 6 No. 2, pp. 133-154.
- Lopez, A.G. and Cuerdo-Arango, M.A. (2008), "Relationship among values, beliefs, norms and ecological behavior", *Psicphthema*, Vol. 20 No. 4, pp. 623-629.
- Luken, R., Van Rompaey, F. and Zigova, K. (2008), "The determinants of EST adoption by manufacturing plants in developing countries", *Ecological Economics*, Vol. 66 No. 1, pp. 141-152.
- McCarty, J.A. and Shrum, L.J. (1994), "The recycling of solid wastes: personal and cultural values and attitudes about recycling as antecedents of recycling behavior", *Journal of Business Research*, Vol. 30 No. 1, pp. 53-62.

- Mahoney, S. (2011), "Study: green gap is bigger than ever", available at: [www.mediapost.com/publications/article/148938/study-green-gap-is-bigger-than-ever.html](http://www.mediapost.com/publications/article/148938/study-green-gap-is-bigger-than-ever.html) (accessed 28 February 2012).
- Mainieri, T., Barnett, E.G., Valdero, T.R., Unipan, J.B. and Oskamp, S. (1997), "Green buying: the influence of environmental concern on consumer behavior", *Journal of Social Psychology*, Vol. 137 No. 2, pp. 189-204.
- Majláth, M. (2010), "Can Individuals do anything for the environment? The role of perceived consumer effectiveness", *Proceedings of FIKUSZ '10 Symposium, for Young Researchers, 2010*, Óbuda University Keleti Károly Faculty of Business and Management, Tavaszmező u, H-1084 Budapest, Hungary, pp 157-166, available at: <http://kgk.uni-obuda.hu/fikusz> (accessed 14 May, 2013).
- Mangla, S., Madaan, J. and Chan, F.T.S. (2013), "Analysis of flexible decision strategies for sustainability-focused green product recovery system", *International Journal of Production Research*, Vol. 51 No. 11, pp. 3428-3442.
- Massoud, M.A., Fayad, R., Kamleh, R. and El-Fadel, M. (2010), "Environmental management system (ISO 14001) certification in developing countries: challenges and implementation strategies", *Environmental Science and Technology*, Vol. 44 No. 6, pp. 1884-1887.
- Mat Said, A., Ahmadun, F.R., Paim, L.H. and Masud, J. (2003), "Environmental concerns, knowledge and practice gap among Malaysian teachers", *International Journal of Sustainability in Higher Education*, Vol. 4 No. 4, pp. 305-313.
- Matthew, W. (2013), "Does green management matter for donation intentions?: the influence of environmental consciousness and environmental importance", *Management Decision*, Vol. 51 No. 8, pp. 1716-1732.
- Minton, A.P. and Rose, R.L. (1997), "The effects of environmental concern on environmentally friendly consumer behavior: an exploratory study", *Journal of Business Research*, Vol. 40 No. 1, pp. 37-48.
- Mittal, B. and Lassar, W.M. (1998), "Why do customers switch? The dynamics of satisfaction versus loyalty", *Journal of Services Marketing*, Vol. 12 No. 3, pp. 177-194.
- Mont, O. and Leire, C. (2009), "Socially responsible purchasing in supply chains: drivers and barriers in Sweden", *Social Responsibility Journal*, Vol. 5 No. 3, pp. 388-407.
- Montalvo, C. (2008), "General wisdom concerning the factors affecting the adoption of cleaner technologies: a survey 1990-2007", *Journal of Cleaner Production*, Vol. 16 No. 1, pp. S7-S13.
- Moser, A.K. (2015), "Thinking green, buying green? Drivers of pro-environmental purchasing behavior", *Journal of Consumer Marketing*, Vol. 32 No. 3, pp. 167-175.
- Mostafa, M.M. (2007), "A hierarchical analysis of the green consciousness of the Egyptian consumer", *Psychology & Marketing*, Vol. 24 No. 5, pp. 445-473.
- Nunnally, J.C. (1967), *Psychometric Theory*, McGraw Hill, New York, NY, Cited in Westland, J.C. (2010), Lower bounds on sample size in structural equation modelling, *Electronic Commerce Research and Applications*, PII: S1567-4223(10)00054-2, doi: [10.1016/j.eierap.2010.07.003](https://doi.org/10.1016/j.eierap.2010.07.003).
- Oskamp, S., Harrington, M.J., Edwards, T.C., Sherwood, D.L., Okuda, S.M. and Swanson, D.C. (1991), "Factors influencing household recycling behaviour", *Environment and Behavior*, Vol. 23 No. 4, pp. 494-519.
- Ottman, J.A. (1993), *Green Marketing: Challenges and Opportunities for the New Marketing Age*, NTC Business Books, Lincolnwood, IL, p. 10.
- Ouellette, J.A. and Wood, W. (1998), "Habit and intention in everyday life: the multiple processes by which past behavior predicts future behaviour", *Psychological Bulletin*, Vol. 124 No. 1, pp. 54-74.
- Ozmete, E. (2007), "An evaluation of locus of control as a system related to life management: a case study on youth", *World Applied Science Journal*, Vol. 2 No. 5, pp. 691-698.

- Paladino, A. and Baggiere, J. (2008), "Are we 'green'? An empirical investigation of renewable electricity consumption", *European Advances in Consumer Research*, Vol. 18, pp. 340-341, available at: [www.acrwebsite.org/volumes/eacr/vol8/eacr\\_vol8\\_48.pdf](http://www.acrwebsite.org/volumes/eacr/vol8/eacr_vol8_48.pdf)
- Peattie, K. (2001), "Towards sustainability: the third stage of green marketing", *The Marketing Review*, Vol. 2 No. 2, pp. 129-146.
- Pickett, G.M., Kangun, N. and Grove, S.J. (1993), "Is there a general conserving consumer? A public policy concern", *Journal of Public Policy & Marketing*, pp. 234-243.
- Pudaruth, S., Juwaheer, T.D. and Seewoo, Y.D. (2015), "Gender-based differences in understanding the purchasing patterns of eco-friendly cosmetics and beauty care products in Mauritius: a study of female customers", *Social Responsibility Journal*, Vol. 11 No. 1, pp. 179-198.
- Punyatoya, P. (2015), "Effect of perceived brand environment-friendliness on Indian consumer attitude and purchase intention", *Marketing Intelligence and Planning*, Vol. 33 No. 3, pp. 258-275.
- Rahbar, E. and Wahid, N.A. (2011), "Investigation of green marketing tools' effect on consumers' purchase behavior", *Business Strategy Series*, Vol. 12 No. 2, pp. 73-83.
- Reizenstein, R.C., Hills, G.E. and Philpot, J.W. (1974), "Willingness to pay for control of air pollution: a demographic analysis", *1974 Combined Proceedings*, American Marketing Association, Chicago, IL, pp. 323-328.
- Renukappa, S., Akintoye, A., Egbu, C. and Goulding, J. (2013), "Carbon emission reduction strategies in the UK industrial sectors: an empirical study", *International Journal of Climate Change Strategies and Management*, Vol. 5 No. 3, pp. 304-323.
- Roberts, J.A. (1996), "Green consumers in the 1990s: profile and implications for advertising", *Journal of Business Research*, Vol. 36 No. 3, pp. 217-231.
- Roper Organization and Johnson Wax (1990), *The Environment: Public Attitudes and Individual Behavior*, The Roper Organization, New York, NY.
- Rosenberg, M.J. (1956), "Cognitive structure and attitudinal affect", *Journal of Abnormal and Social Psychology*, Vol. 53 No. 3, pp. 367-372.
- Rotter, J.B. (1966), "Generalized expectancies for internal versus external control of reinforcement", *Psychological Monographs: General and Applied*, Vol. 80 No. 1, pp. 1-28.
- Roy, H. (2013), "Effect of green marketing on consumer behaviour – a study with practical reference to West Bengal", *International Journal of Behavioural Social and Movement Sciences*, Vol. 2 No. 1, pp. 44-55.
- Sharma, K. and Bansal, M. (2013), "Environmental consciousness, its antecedents and behavioural outcomes", *Journal of Indian Business Research*, Vol. 5 No. 3, pp. 198-214.
- Shim, S. (1995), "Environmentalism and consumers' clothing disposal patterns: an exploratory study", *Clothing and Textiles Research Journal*, Vol. 13 No. 1, pp. 38-48.
- Shim, S., Warrington, P. and Goldsberry, E. (1999), "A personal value-based model of college students: attitudes and expected choice retailing careers", *Family and Consumer Sciences Research Journal*, Vol. 28 No. 1, pp. 28-51.
- Shrum, L.J., McCarty, J.A. and Lowrey, T.M. (1995), "Buyer characteristics of the green consumer and their implications for advertising strategy", *Journal of Advertising*, Vol. 24 No. 2, pp. 71-82.
- Singh, N. and Gupta, K. (2013), "Environmental attitude and ecological behaviour of Indian consumers", *Social Responsibility Journal*, Vol. 9 No. 1, pp. 4-18.
- Singh, P.B. and Pandey, K.K. (2012), "Green marketing: policies and practices for sustainable development, integral review", *A Journal of Management*, Vol. 5 No. 1, pp. 22-30.
- Singh, A., Singh, B. and Dhingra, A.K. (2012), "Drivers and barriers of green manufacturing practices: a survey of Indian industries", *International Journal of Engineering Sciences*, Vol. 1 No. 1, pp. 5-19.



- Sinha, A.K. and Anand, A. (2017), "Towards fuzzy preference relationship based on decision making approach to access the performance of suppliers in environmental conscious manufacturing domain", *Computers and Industrial Engineering*, Vol. 105, pp. 39-54.
- Solomon, M.R., Bamossy, G., Askegaard, S. and Hogg, M.K. (2010), *Consumer Behaviour: A European Perspective*, 4th ed., Prentice Hall, New York, NY.
- Soutar, G.N., Ramaseshan, B. and Molster, C.M. (1994), "Determinants of pro-environmental consumer purchase behaviour: some Australian evidence", in Cote, J.A. and Leong, S.M. (Eds), *Asia Pacific Advances in Consumer Research*, Association for Consumer Research, Provo, UT, Vol. 1, pp. 28-35.
- Steg, A. and Vlek, R. (2009), "Encouraging pro-environmental behaviour", *Journal of Environmental Psychology*, Vol. 29 No. 3, pp. 309-317.
- Straughan, R.D. and Roberts, J.A. (1999), "Environmental segmentation alternatives: a look at green consumer behavior in the new millennium", *Journal of Consumer Marketing*, Vol. 16 No. 6, pp. 558-575.
- Tan, B. (2011), "The role of perceived consumer effectiveness on value-attitude-behaviour model in green buying behaviour context", *Australian Journal of Basic and Applied Sciences*, Vol. 5 No. 12, pp. 1766-1771.
- Tan, B. and Lau, T. (2011), "Green purchase behavior: examining the influence of green environmental attitude, perceived consumer effectiveness and specific green purchase attitude", *Australian Journal of Basic and Applied Sciences*, Vol. 5 No. 8, pp. 559-567.
- Tang, Y., Wang, X. and Lu, P. (2014), "Chinese consumer attitude and purchase intent towards green products", *Asia-Pacific Journal of Business Administration*, Vol. 6 No. 2, pp. 84-96.
- Tanner, C. and Kast, S.W. (2003), "Promoting sustainable consumption: determinants of green purchases by Swiss consumers", *Psychology and Marketing*, Vol. 20 No. 10, pp. 883-902.
- Taylor, S. and Todd, P.A. (1995), "Understanding information technology usage: a test of competing models", *Information Systems Research*, Vol. 6 No. 2, pp. 144-176.
- Thøgersen, J. and Ölander, F. (2006), "The dynamic interaction of personal norms and environment-friendly buying behavior: a panel study", *Journal of Applied Social Psychology*, Vol. 36 No. 7, pp. 1758-1780.
- Thøgersen, J. and Zhou, Y. (2010), Motives of organic food buyers in China – do they differ from Europe?, Paper presented at Knowledge Collaboration and Learning for Sustainable Innovation, ERSCP – EMSU Conference, Delft, The Netherlands.
- Tilikidou, I. (2007), "The effects of knowledge and attitudes upon Greeks' pro-environmental purchasing behaviour", *Corporate Social Responsibility and Environmental Management*, Vol. 14 No. 3, pp. 121-134.
- Tracy, A.P. and Oskamp, S. (1983), "Relationships among ecologically responsible behaviors", *Journal of Environmental Systems*, Vol. 13 No. 2, pp. 115-126.
- Tung, S., Shih, C., Wei, S. and Chen, Y. (2012), "Attitudinal inconsistency towards organic food in relation to purchasing intention and behaviour: an illustration of Taiwan consumers", *British Food Journal*, Vol. 114 No. 7, pp. 997-1015.
- Van Liere, K.D. and Dunlap, R.E. (1981), "Environmental concern", *Does it make a difference how it's measured? Environment and Behavior*, Vol. 13 No. 6, pp. 651-676.
- Verhoef, P.C. (2005), "Explaining purchases of organic meat by Dutch consumers", *European Review of Agricultural Economics*, Vol. 32 No. 2, pp. 245-267.
- Vermeir, I. and Verbeke, W. (2006), "Sustainable food consumption: exploring the consumer 'attitude - behavioral intention' gap", *Journal of Agricultural and Environmental Ethics*, Vol. 19 No. 2, pp. 169-194.
- Verplanken, B., Aarts, H. and Van Knippenberg, A. (1997), "Habit, information acquisition, and the process of making travel mode choices", *European Journal of Social Psychology*, Vol. 27 No. 5, pp. 539-560.



- Webster, F.E. Jr (1975), "Determining the characteristics of the socially conscious consumer", *Journal of Consumer Research*, Vol. 2 No. 3, pp. 188-196.
- Westland, J.C. (2010), "Lower bounds on sample size in structural equation modelling", *Electronic Commerce Research and Applications*, PII: S1567-4223(10)00054-2, doi: [10.1016/j.elerap.2010.07.003](https://doi.org/10.1016/j.elerap.2010.07.003).
- Winter, S. and Lasch, R. (2016), "Recommendations for supplier innovation evaluation from literature and practice", *International Journal of Operations and Production Management*, Vol. 36 No. 6, pp. 643-664.
- Wu, J. and Chen, C. (2013), "The manufacturing strategy decision analysis framework for excelling operating excellence of Taiwan light emitting diode industry", *Journal of Quality*, Vol. 20 No. 4, pp. 403-425.
- Zelesny, L.C. and Schultz, P. (2000), "Psychology of promoting environmentalism: promoting environmentalism", *Journal of Social Issues*, Vol. 56 No. 3, pp. 365-371.
- Zhang, B., Bi, J. and Liu, B. (2009), "Drivers and barriers to engage enterprises in environmental management initiatives in Suzhou industrial park, China", *Frontiers of Environmental Science & Engineering in China*, Vol. 3 No. 2, pp. 210-220.

#### Further reading

- Ajzen, I. and Fishbein, M. (1969), "The prediction of behavioural intentions in a choice situation", *Journal of Experimental Social Psychology*, Vol. 24 No. 3, pp. 207-224.
- Bagozzi, R.B. (1992), "The self-regulation of attitudes, intentions and behavior", *Social Psychology Quarterly*, Vol. 55 No. 2, pp. 178-204.
- Creswell, J.W. and Clark, V.L.P. (2011), *Designing and Conducting Mixed Methods Research*, SAGE Publications, New York, NY.
- Hackman, C.L. and Knowlden, A.P. (2014), "Theory of reasoned action and theory of planned behavior-based dietary interventions in adolescents and young adults: a systematic review", *Adolescent Health Medical Theory*, Vol. 5, pp. 101-114.
- Hofstede, G. (1980), *Culture's Consequences: International Differences in Work-Related Value*, Sage, Beverly Hills, CA.
- Kaplan, S. (1991), "Beyond rationality: clarity-based decision making", in *Environment, Cognition and Action*, Garling, T. and Evans, G. (Eds), Oxford University Press, New York, NY, 171-190.
- Leonard, L.N.K., Cronon, T.P. and Kreie, J. (2004), "What influences IT ethical behaviour intentions: planned behaviour, reasoned action, perceived importance, or individual characteristics?", *Information and Management*, Vol. 42 No. 1, pp. 143-158.
- Lu, L., Chang, H. and Chang, A. (2015), "Consumer personality and green buying intention: the mediate role of consumer ethical beliefs", *Journal of Business Ethics*, Vol. 127 No. 1, pp. 205-219.
- Majláth, M. (2008), "Challenges in Marketing: reasons for the Existence of Green Marketing, FIKUSZ 2008", *Proceedings of Business Sciences – Symposium for Young Researchers*, Budapest 7th November, 2008, , 137-147.
- Nagy, S. (2005), Cited in Majláth, M. (2010), "Can Individuals do anything for the environment? The role of perceived consumer effectiveness", *Proceedings of FIKUSZ '10 Symposium, for Young Researchers*, pp.157-166, available at: <http://kgk.uni-obuda.hu/fikusz> (accessed 14 may 2013).
- Schlegelmilch, B.B., Bohlen, G.M. and Diamantopoulos, A. (1996), "The link between green purchasing decisions and measures of environmental consciousness", *European Journal of Marketing*, Vol. 30 No. 5, pp. 35-55.
- Schultz, P.W. and Zelesny, L.C. (1998), "Values and proenvironmental behavior: a five-country survey", *Journal of Cross-Cultural Psychology*, Vol. 29 No. 4, pp. 540-558.

- 
- Triandis, H. (1995), *Individualism and Collectivism*, Westview Press, Boulder, CO.
- Triandis, H.C. (1989), "The self and social behavior in differing cultural contexts", *Psychological Review*, Vol. 96 No. 3, pp. 506-520.
- van Huylenbroek, G., Mondelaers, K., Verbeke, W. and Van Huylenbroeck, G. (2009), "Personal determinants of organic food consumption: a review", *British Food Journal*, Vol. 111 No. 10, pp. 1140-1167.
- Weigel, R.H. (1983), "Environmental attitudes and prediction of behavior", in Feimer, N.R. and Geller, E.S. (Eds), *Environmental Psychology: Directions and Perspectives*, Praeger, New York, NY, pp. 257-287.
- Yeonshin, K. and Chio, S.M. (2005), "Antecedents of green purchase behavior: an examination of collectivism, environmental concern, and PCE", *Advances in Consumer Research*, Vol. 32 No. 1, pp. 592-599.

## Appendix

### *Eco-consciousness (ECO)*

We are approaching the limit of the number of people the earth can support.  
The earth has plenty of natural resources if we just learn to develop them. (R)  
The earth is like a spaceship with only limited room and resources.  
Humans have the right to modify the natural environment to suit their needs. (R)  
Plants and animals have as much right as humans to exit.  
Humans were meant to rule over the rest of the nature. (R)  
When humans interfere with nature, it often produces disastrous consequences.  
The balance of nature is strong enough to cope with the impacts of modern industrial nations.  
(R)(a)  
The balance of nature is very delicate and easily upset.  
Human ingenuity will ensure that we do not make the earth unliveable. (R)  
Despite our special abilities, humans are still subject to the laws of nature. (a)  
Humans will eventually learn enough about how nature works to be able to control it. (R)  
Humans are severely abusing the environment.  
The so-called ecological crisis facing humankind has been greatly exaggerated. (R)(a)  
If things continue on their present course, we will soon experience a major ecological catastrophe.

### *Purchase customer effectiveness (PCE)*

The conservation efforts of one person are useless as long as other people refuse to conserve.  
There is not much that any one individual can do about the environment.  
As one person has no effect on the solution of environmental problems, it does not count what I do.

### *Green purchase attitudes scale (GPA)*

I (1 \_ dislike; 5 \_ like) the idea of purchasing green.  
Purchasing green is a (1 \_ bad; 5 \_ good) idea.  
I have a/an (1 \_ unfavourable; 5 \_ favourable) attitude towards purchasing a green version of a product.

*Green purchase intention scale (GPI)*

- Over the next month, I will consider buying products because they are less polluting.
- Over the next one month, I will consider switching to other brands for ecological reasons.
- Over the next one month, I plan to switch to a green version of a product.

*Green purchase behaviour (GPB)*

- I choose the environmentally sustainable alternative for products if one with a similar price is available.
- I choose the environmentally sustainable alternative for products regardless of their price.
- I try to discover the environmental effects of environmentally sustainable products prior to purchase.
- I bring my own shopping bag at store in order to reduce the use of plastic bags.
- If I understand the potential damage to the environment that some products can cause, I do not purchase those products.
- I don't buy a product if the company which sells it is environmentally irresponsible.

**Corresponding author**

Rameshwar Dubey can be contacted at: [rameshwardubey@gmail.com](mailto:rameshwardubey@gmail.com)