

Green Purchase Behaviours of Muslim Consumers: An Examination of Religious Value and Environmental Knowledge

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Abstract: Green behaviour is an increasingly important topic gaining much attention worldwide. This study examines the linkages between religious value, environmental knowledge, and green purchase behaviours from a sample of 190 Muslim consumers in Indonesia, a country with the world's largest Muslim population that accounts for about 80% of all Muslims living in Southeast-East Asia. Using partial least square (PLS), a variance-based structural equation modelling (SEM), results indicate that religious value positively affects green purchase behaviours, with environmental concerns, green purchase attitudes, and green purchase intentions as mediators. In addition, this study demonstrates that environmental knowledge has a positive impact on green purchase behaviours. To the literature, this study also confirms that religious value is a multidimensional construct (intrinsic, extrinsic, and quest) with reflective first-order and formative second-order items. Consequently, the study provides practical implications for green marketers to fine-tune their marketing strategies, as well as directions for future research.

Keywords: *environment, green product, environmental knowledge, religious value, purchase behaviours, formative construct*

Introduction

Green behaviour is an important topic gaining much attention in today's society (Cronin *et al.*, 2011; Paul *et al.*, 2016; Cho *et al.*, 2013; Haanpää, 2007). This trend is mainly originated by the rise in consumers' awareness and concerns about various environmental issues affected by their purchasing behaviours (Antonetti & Maklan, 2014; Johnstone & Tan, 2015; Laroche *et al.*, 2001). Therefore, to support the environment, consumers are increasingly using their purchasing power to buy green products (Haanpää, 2007; Paul *et al.*, 2016; Laroche *et al.*, 2001). Consequently, green products have grown steadily around the world (Diamantopoulos *et al.*, 2003; Johnstone & Tan, 2015; Chen, 2010; Thøgersen *et al.*, 2012), including in Muslim countries. A total of 1.57 billion Muslim consumers in more than 200 countries (The Forum on Religion and Public Life 2009) represent a large market for green products, partly because Muslim's religious value emphasise protection of the environment, which in turn leads to green purchase behaviours (Hassan, 2014). Notwithstanding these facts, few studies investigate the relationship between religious value and green purchase behaviours (Minton *et al.*, 2015; Lindridge, 2005; Felix & Braunsberger, 2016; Hassan, 2014). This study fills this gap using the conceptual framework of the Value-Attitude-Behaviour hierarchy (Vaske & Donnelly, 1999; Homer & Kahle, 1988). Religious value (RGV) is used to predict green purchase behaviours (GRB), with environmental concerns (EC), green purchase attitudes (GPA), and green purchase intentions (GPI) as mediators.

Unlike extant studies that focus on a unidimensional construct, or exclude the quest dimension (Cleveland & Chang, 2009; Lewis *et al.*, 2001; Felix & Braunsberger, 2016; Hassan, 2014), the assessment of religious value in this study includes all three dimensions of religiosity -

intrinsic, extrinsic, and quest (Hills *et al.*, 2005; Batson *et al.*, 1991). The quest dimension has recently gained special attention because it measures intellectual rather than dogmatic approaches to religion, and therefore accords with most liberal religious views (Hills *et al.*, 2005). Furthermore, Hills *et al.* (2005) suggest psychologically disparate ways of being religious.

In addition, this study also examines environmental knowledge (EK) as a predictor of green purchase behaviours. Consumers' knowledge about an issue impacts upon decision making (Peattie, 2010). Consumers avoid circumstances where they have insufficient knowledge to guide their behaviours and where the possibility of confusion is great (Roberts, 1996; Peattie, 2010). This justifies why consumers who know enough about environmental issues tend to involve in green purchase behaviours. Although environmental knowledge has, in general, been found to predict green purchase behaviours, contradictory findings have also been noted in the literature (Chan, 2001). Such mixed empirical results suggest a more complex relationship between environmental knowledge and green purchase behaviours, such that their relationship is mediated by green purchase attitudes (Chan & Lau, 2000; Tanner & Kast, 2003; Mostafa, 2007).

Theoretical Background and Research Hypotheses

Religious value (RGV)

Religiosity is the degree to which beliefs of religious values and ideals are held and practised by an individual, revealed in the centrality of religion and directed in a person's daily actions (Cleveland & Chang, 2009). RGV represents faith-based values that originate from religious traditions based on scriptures, which are embedded in an individual's life (Hassan, 2014). For Muslims, RGV refers to values derived from the Quran and hadith (sayings and traditions of the prophet Muhammad), which are the primary sources of Islamic teachings.

Driven by the notion that people could be religious in various ways (Hills *et al.*, 2005), RGV expands to three dimensions - intrinsic, extrinsic, and quest. People with intrinsic orientation view religion as an end, and therefore endeavour to internalise and follow it fully. They view religion as the most important aspect of life, and regard other needs with less ultimate significance. Extrinsic people view religion as a means, and therefore use religion as an instrument to achieve non-religious goals such as providing security and solace, sociability and distraction, status and self-justification (Allport & Ross, 1967, p.434). Regarding a quest orientation, Batson *et al.* (1991) suggest that religion involves open-ended and responsive dialogue about existential questions (e.g., questions about the meaning of life and death, and relationships with others) and resisting clear-cut answers. Quest individuals engage in constant questioning, and entertain doubt as a way of being religious.

The following Quranic verses (translated by Sahih International) and hadith stress the importance of protecting the environment.

Then We made you successors in the land after them so that We may observe how you will do (Quran, 10:14).

And when he goes away, he strives throughout the land to cause corruption therein and destroy crops and animals. And Allah does not like corruption (Quran, 2:205).

The world is a green and pleasant thing. God has made you stewards of it, and looks at how you behave (Prophet Muhammad, narrated by Muslim).

If a Muslim plants a tree or sows seeds, and then a bird, or a person or an animal eats from it, it is regarded as a charitable gift for him (Prophet Muhammad, narrated by Bukhari).

Based on the verses, in Islamic teachings, human are representatives of God, entrusted to care for Earth (e.g., land, forest/crops, and wildlife/animals). Preserving the environment is a fundamental aspect of faith; activities that endanger the natural environment and resources represent corruption, and Islam strictly forbids it. Corruption here includes any form of over-exploitative and abusive behaviours toward nature such as deforestation, littering, toxic waste pollution, and improper use of pesticides. In addition, Muslims hold that God made the universe in perfect balance (Hassan 2014), and humans must respect the rights of plants and animals, not master the environment irresponsibly (Chan, 2001; Chan & Lau, 2000). They emphasise living in harmony with nature because it is rooted in Islamic culture. For example, the first Caliph, Abu Bakr, ordered his army commander not to destroy palm trees, houses, or fields of wheat, and to cut down fruit trees and kill cattle only when needed for nourishment (Mostafa, 2007). Islam also teaches about preservation of water (Quran, 16:65; 50:9), treating animals with dignity (Quran, 6:38; 16:68; and 5:4), and patching the ozone (Quran, 21:32; 40:64). To survive, humans must restore these things to harmony. For consumers, purchasing and using green products is a way to save the environment and ensure sustainability. Accordingly, consumers with higher religious devotion should be more likely to purchase green products. Even though extant literature suggests that intentions predict behaviours (Ajzen, 1991), without the examination of values affecting attitudes, it is insufficient to capture consumers' mind in relation to their purchase decisions. In addition, marketers are interested to understand the underlying values and beliefs that manifest attitudes toward behaviours (Ramayah *et al.*, 2010). The Value-Attitude-Behaviour hierarchy and extant studies suggest that religious value has considerable influence on consumer behaviours (Minton *et al.*, 2015; Lindridge, 2005; Hassan, 2014). RGV positively affects EC (Hassan, 2014). Moreover, Hassan (2014) also hypothesises a causal relationship between RGV and GPA, and between RGV and GPI. Therefore:

H1. Religious value (RGV) has a direct positive relationship with environmental concerns (EC).

H2. Religious value (RGV) has a direct positive relationship with purchase attitudes (GPA).

H3. Religious value (RGV) has a direct positive relationship with green purchase intentions (GPI).

Environmental knowledge (EK)

EK refers to knowledge about definition, causes and consequences of environmental issues (e.g., what is climate change?), and about necessary actions (e.g., how to overcome climate change issues?) (Tanner & Kast, 2003). It represents more than just simply factual information about aspects of environmental, ecological, or energy-saving phenomena; it involves collective responsibilities necessary for sustainable development (Mostafa, 2007; Diamantopoulos *et al.*, 2003). It is commonly assumed that consumer knowledge about the environment drives green consumption (Johnstone & Tan, 2015; Peattie, 2010). Peattie (2010) argues that consumers are objective and always rational regarding consumption choices and behaviour. For example, consumers with high environmental knowledge purchase energy-efficient household appliances and detergent packed in recycled materials because they are less polluting, and in the long run they save money. Numerous studies suggest that environmental knowledge encourages positive attitudes toward the environment (Mostafa, 2007; Tanner & Kast, 2003; Chan, 2001; Chan & Lau, 2000). Thus:

H4. Environmental knowledge (EK) has a direct positive relationship with green purchase attitudes (GPA).

Environmental concerns (EC)

EC denotes an individual's general orientation and concern toward environment issues (Kim & Choi, 2005), and it influences how consumers choose the types of products they purchase (Banerjee *et al.*, 1995). For example, consumers with high concern for the environment purchase fuel-efficient cars, organic foods, and high-efficiency light bulbs. When concern about environmental problems increases, consumers become motivated to act on them and

more willing to engage green purchase behaviours (Kilbourne & Pickett, 2008). Extant studies suggest that the higher a consumer's concerns toward the environment, the more positive that consumer's attitudes toward green products (Kilbourne *et al.*, 2002; Kilbourne & Pickett, 2008; Paul *et al.*, 2016; Mostafa, 2007). Therefore:

H5. Environmental concerns (EC) have a direct positive relationship with green purchase attitudes (GPA).

Green purchase attitudes (GPA)

Ajzen (1991) defines attitudes as an individual's tendency to respond with some degree of favourableness or unfavourableness evaluation of objects or phenomena. The Theory of Reasoned Action (TRA) suggests that consumers' attitudes influence intentions to engage in behaviours (Ajzen, 1991). Green purchase attitudes is the psychological emotion routed through consumers' evaluations and, if positive, green purchase intentions tend to be stronger (Paul *et al.*, 2016; Mostafa, 2007). Therefore, consumers prefer green products if they hold positive attitudes toward preserving environment (Paul *et al.*, 2016). Much research suggests a positive relationship between attitudes and intentions in the context of green consumption, showing that the more favourable the attitudes, the greater the purchase intentions will be (Chan, 2001; Paul *et al.*, 2016; Nair & Little, 2016; Sparks & Shepherd, 1992), and thus:

H6. Green purchase attitudes (GPA) have a direct positive relationship with green purchase intentions (GPI).

Green purchase intentions (GPI)

Intention is a motivational factor that influences behaviour; it indicates how hard an individual is willing to try, and how much effort he/she is planning to exert, to engage in a behaviour (Ajzen, 1991). Green purchase intentions refer to an individual's tendency or willingness to purchase green products versus non-green products in the future. Thus, the stronger the intentions to purchase green products, the more likely the purchase is made. Research suggests that GPI influences GRB positively (Mostafa, 2007; Chan, 2001; Carrus *et al.*, 2008; Chan & Lau, 2000), and therefore:

H7. Green purchase intentions (GPI) have a direct positive relationship with green purchase behaviours (GRB).

Green purchase behaviour (GRB)

In accordance with TRA and the Value-Attitude-Behaviour hierarchy, attitudes toward the purchase of green products predict green purchase intentions, which in turn predict future purchase behaviours (Ajzen, 1991; Homer & Kahle, 1988; Vaske & Donnelly, 1999). However, research that examines the link between green attitudes and behaviours demonstrates inconsistent results. Some research suggest that purchase intentions toward a product correlate positively with behaviours of purchasing the product (Chan, 2001; Mostafa, 2007). Other studies suggest that although a large number of consumers claim that they are pro-environmentalists, expressing concerns about ecological issues and intending to purchase green products, only a few behave accordingly (Gleim *et al.*, 2013; Johnstone & Tan, 2015; Tanner & Kast, 2003; Moser, 2016). Gleim *et al.* (2013) and Tanner & Kast (2003) explore the gap between attitudes/intentions and behaviour, finding contributing factors such as green product prices (i.e., consumers' willingness to pay), quality/performance, trust of greenness, and availability.

Figure 1 shows a conceptual model implied by the hypotheses discussed in this study.

Method

Data collection and sample

A survey using structured questionnaire consisting of respondents' profile and forty-four statements grouped under six constructs was conducted from May 2016 to August 2016 to collect data. A non-probability data sampling method was used, specifically a purposive sampling technique. The unit of analysis was individual Muslim consumers in Indonesia who purchased green products within the last year. Indonesia was selected because it has the world's

largest Muslim population that accounts for about 13% of all Muslims in the world, or more than 80% of all Muslims living in Southeast Asia (The Forum on Religion and Public Life 2009).

To calculate the required sample size, G*Power software was used. The model had a maximum of 3 predictors (for green purchase attitudes). The effect size was set as medium 0.15 and power needed as 0.95, thus the total sample size required was 119. Based on this output, a total of 190 completed and valid questionnaires that met the study's requirement were used for the analyses.

Measures

This section discusses the measures used in the study, their dimensionality, and epistemic relationships. An epistemic relationship describes the link between constructs and indicators, and consists of two types. A formative measurement model posits that indicators influence a construct jointly (Polites *et al.*, 2012), and a reflective measurement model suggests that changes in the construct lead to variation in its indicators (Polites *et al.*, 2012).

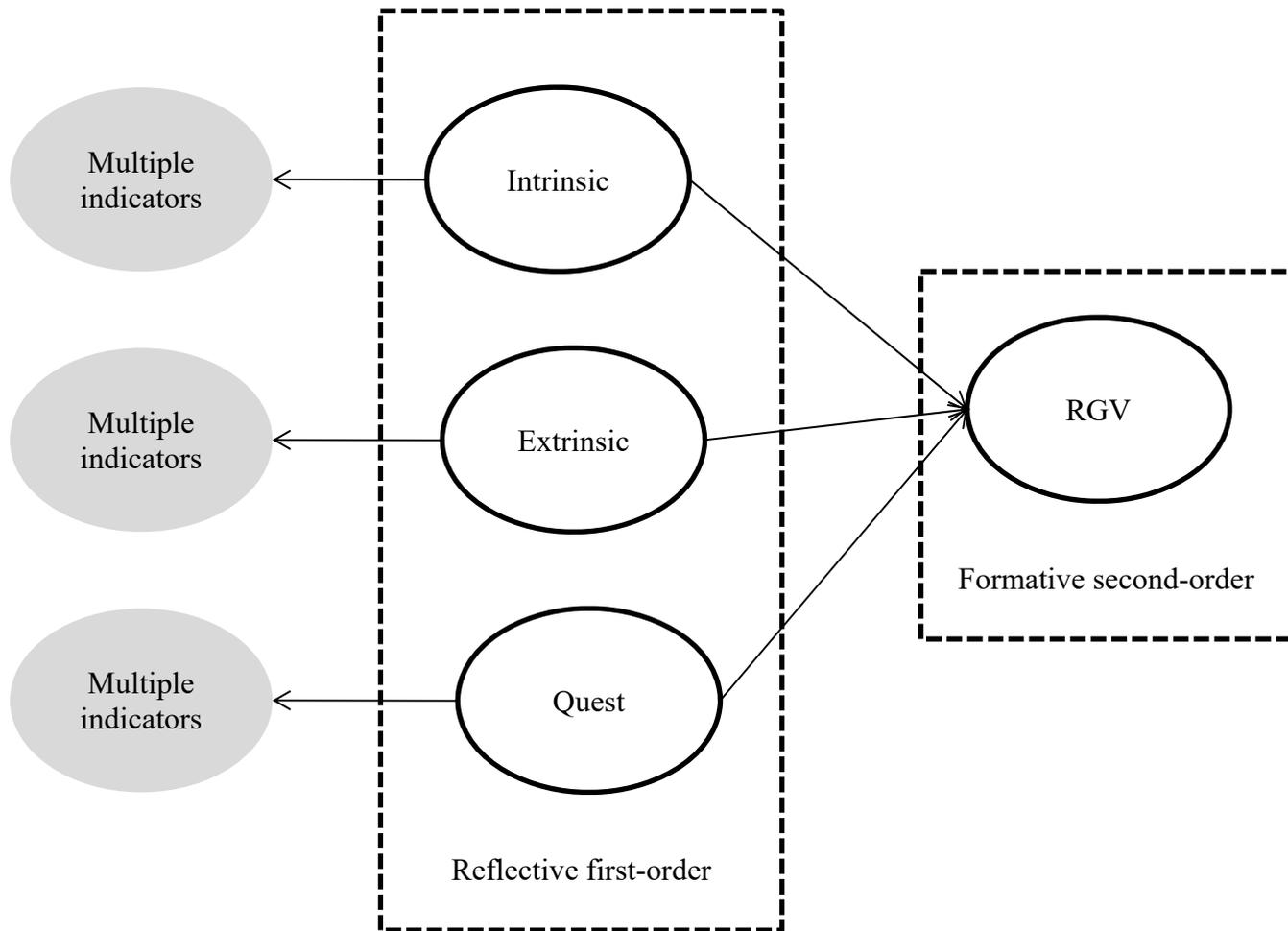
The full set measures used in this study is listed in Table 2, all adapted from measures validated in extant studies. A 5-item, 5-point Likert type scale was operationalised to measure environmental knowledge based on Mostafa (2007). We measured environmental concerns on a 5 items, 5-point Likert type scale which was adopted from Dunlap *et al.* (2000), Kilbourne & Picket (2008), and Zimmer *et al.* (1994). The validated 5-item, 5-point likert type scale was used to measure green purchase attitudes taken from these studies (Mostafa, 2007; Taylor & Todd, 1995; Sparks & Shepherd, 1992). Green purchase intentions scale was measured on a 5-item, 5-point Likert type scale adopted from Mostafa (2007), Chan & Lau (2000), and Ling-ye (1997). Moreover, a 5-item, 5-point Likert type green purchase behaviours scale was adopted from Kim & Choi (2005), and Straughan & Roberts (1999).

The RGV construct was a high-order construct with multiple reflective first-order items and three formative second-order dimensions (intrinsic, extrinsic, and quest). The intrinsic, extrinsic, and quest dimensions of religious values were independent, unrelated, and not interchangeable (Batson *et al.*, 1991; Hills *et al.*, 2005), and therefore formative measures were more appropriate (Hulland, 1999; Jarvis *et al.*, 2003). Figure 2 shows the multidimensional construct of RGV. Other constructs (i.e., EK, EC, GPA, GPI, and GRB) were modelled using a unidimensional construct, with multiple reflective items.

Data analysis

SmartPLS 3.0 (Ringle *et al.*, 2015) was used during data analysis. The software was selected to test the research model and hypotheses because of its appropriateness with handling several issues (Picón *et al.*, 2014; Henseler *et al.*, 2009; Hair *et al.*, 2014; Cepeda-Carrion *et al.*, 2016). First, this study uses small sample size. Second, the study focuses on prediction of a key target construct. Third, the model is considered complex according to its structural model relationships, and the level of dimensionality. Fourth, the study is incremental since it adds new measures and structural paths to a base model tested in extant studies. Fifth, relationships between constructs and indicators must be modelled in a reflective and formative measurement models.

Figure 2. RGV multidimensional construct



Results

Descriptive results

The profiles of respondents are shown in Table 1. Of the total respondents, 9.5% were above 35 years of age, and those between 18-24 and 25-34 constituted 25.8% and 64.7%, respectively. The majority of respondents were single (68.4%), Bachelor's degree graduates (70.5%), and employed (70.5%). There were 54.2% female, with majority of them earning more than IDR 4,650,000.

Table 1: Demographic profile of respondents

Description	Total (N = 190)	
	N	Percentage
<i>Gender</i>		
Female	103	54.2%
Male	87	45.8%
<i>Age group</i>		
18-24	49	25.8%
25-34	123	64.7%
Above 35	18	9.5%
<i>Marital status</i>		
Single	130	68.4%

Married	60	31.6%
<i>Education level</i>		
Diploma or lower	10	5.3%
Bachelor degree	134	70.5%
Postgraduate degree (master/Ph.D.)	46	24.2%
<i>Employment status</i>		
Employed	134	70.5%
Self-employed	14	7.4%
Unemployed	42	22.1%
<i>Monthly household income</i>		
Less than IDR 4,649,999	45	23.7%
IDR 4,650,000 - IDR 9,299,999	67	35.3%
IDR 9,300,000 - IDR 15,499,999	37	19.5%
IDR 15,500,000 - IDR 21,699,999	22	11.6%
More than IDR 21,700,000	19	10.0%

Measurement model

Results suggest that all convergent validity requirements of the measurement model were met (Table 2). All reflective indicators had standardised loadings greater than 0.5, confirming the reliability of all measurement indicators (Hulland, 1999). Composite reliabilities (CR) were above 0.7 for all constructs and dimensions, demonstrating a high level of internal consistency of items (Hair *et al.*, 2014). Scores for average variance extracted (AVE) were greater than the threshold of 0.5 (Henseler *et al.*, 2009), ensuring convergent validity of the constructs. An AVE value of at least 0.50 indicates that a construct is on average able to explain more than half of the variance of its indicators (Hair *et al.*, 2014).

Table 2: Measurement instruments and convergent validity

Constructs and (Sources)	# of items	CR	AVE	Items	Item Description	Loadings
Religious value - intrinsic (Hills <i>et al.</i> , 2005; Lewis <i>et al.</i> , 2001; Plante & Boccaccini, 1997) VIF = 2.039	10	0.953	0.672	I1	My religious faith is extremely important to me	0.861
				I2	I took my faith as providing purpose in my life	0.760
				I3	My relationship with God is extremely important to me	0.738
				I4	My faith impacts many of my decisions	0.827
				I5	Religion is especially important to me because it answers many questions about the meaning of life	0.883
				I6	I pray every time I am supposed to	0.816
				I7	I always try to carry my religion over into all my other dealings in life	0.799
				I8	My religious beliefs are what lie behind my whole approach to life	0.837
				I9	It is important to spend periods of time to remember God	0.807
				I10	I read literature about my faith	0.856
Religious value – extrinsic (Hills <i>et al.</i> , 2005; Batson <i>et al.</i> , 1991) VIF = 2.031	2	0.884	0.792	E1	The purpose of prayer is to secure a peaceful life	0.883
				E2	What religion offers me most is comfort when sorrows arise	0.897
				E3	I pray chiefly because I have been taught to pray	-
				E4	The primary purpose of prayer is to gain relief and protection	-
Religious value – quest (Hills <i>et al.</i> , 2005; Batson <i>et al.</i> , 1991) VIF = 1.018	4	0.825	0.549	Q1	There are many religious issues on which my views are still changing	0.564
				Q2	God was not very important to me until I began to ask questions about the meaning of life	0.837
				Q3	I am constantly questioning my religious beliefs	0.871
				Q4	I do not expect my religious convictions to change in the next few years (R*)	0.648
				Q5	I was not very interested in religion until began to ask questions about the meaning of life	-
Environmental knowledge (Mostafa, 2007)	5	0.910	0.669	EK1	I know less about recycling than the average person (R*)	0.809
				EK2	I know how to select products and packages that reduce the amount of waste ending up in landfills	0.869
				EK3	I understand the environmental phrases on product packages	0.810

				EK4	I understand the environmental symbols on product packages	0.794
				EK5	I am very knowledgeable about environmental issues	0.805
Environmental concerns (Dunlap <i>et al.</i> , 2000; Kilbourne & Pickett, 2008; Zimmer <i>et al.</i> , 1994)	4	0.879	0.645	EC1	Humans must live in a harmony with nature in order to survive	0.785
				EC2	I am very concerned about the environment	0.807
				EC3	I would be willing to reduce my consumption to help protect the environment	0.838
				EC4	Anti-pollution laws should be enforced more strongly	0.782
				EC5	Plants and animals do not have as much rights as humans to exist (R*)	-
Green purchase attitudes (Mostafa, 2007; Taylor & Todd, 1995; Sparks & Shepherd, 1992)	5	0.936	0.746	GPA1	I like the idea of purchasing green products	0.845
				GPA2	Purchasing green is a good idea	0.868
				GPA3	I have favourable attitude toward purchasing a green version of a product	0.839
				GPA4	My feelings about purchasing green products are positive	0.887
				GPA5	I am interested in the idea of purchasing green products	0.878
Green purchase intentions (Mostafa, 2007; Chan & Lau, 2000; Ling-ye, 1997)	5	0.934	0.738		Over the next month, ...	
				GPI1	I will consider buying green products because they are less polluting	0.891
				GPI2	I will consider switching to other brands for ecological reasons	0.870
				GPI3	I plan to switch to a green version of a product	0.917
				GPI4	I would definitely intend to buy products that are environmentally friendly	0.855
				GPI5	I have no plan to buy those products that are environmentally friendly (R*)	0.754
Green purchase behaviours (Kim & Choi, 2005; Straughan & Roberts, 1999)	5	0.863	0.561	GRB1	I have switched products for ecological reasons	0.873
				GRB2	I always try to buy energy efficient household appliances	0.801
				GRB3	I buy high-efficiency light bulbs to save energy	0.631
				GRB4	I always buy paper and plastic products that are made from recycled materials	0.776
				GRB5	When I have a choice between two equal products, I purchase the one less harmful to other people and the environment	0.631

Note: AVE = Average Variance Extracted; CR = Composite Reliability; VIF = Variance Inflation Factors; E3, E4, Q5, and EC5 were deleted to improve loadings and/or AVE value; R* denotes reverse-scored item

Discriminant validity was assessed following Fornell and Larckell (1981). Table 3 shows that all square roots of the AVE (on the diagonals) were greater than correlations between constructs (on the corresponding row and column), suggesting that discriminant validity was achieved since each reflective construct related more strongly to its own indicators than to others.

Table 3: Discriminant validity

	EC	EK	GPA	GPI	GRB	RGV
EC	0.803					
EK	0.285	0.818				
GPA	0.546	0.256	0.864			
GPI	0.486	0.350	0.570	0.859		
GRB	0.036	0.212	0.141	0.196	0.749	
RGV	0.508	0.087	0.416	0.357	0.128	0.690

Note: Diagonal elements (in bold) represent the square root of AVEs while the off-diagonal elements represent the correlations between constructs; EC = Environmental concerns; EK = Environmental knowledge; GPA = Green purchase attitudes; GPI = Green purchase intentions, GRB = Green purchase behaviours; RGV = Religious values

Assessment of discriminant validity using the heterotrait-monotrait (HTMT) ratio of correlations also indicated that all constructs achieved discriminant validity with values less than 0.85 (Henseler *et al.*, 2015) (Table 4).

Table 4: Heterotrait-monotrait (HTMT)

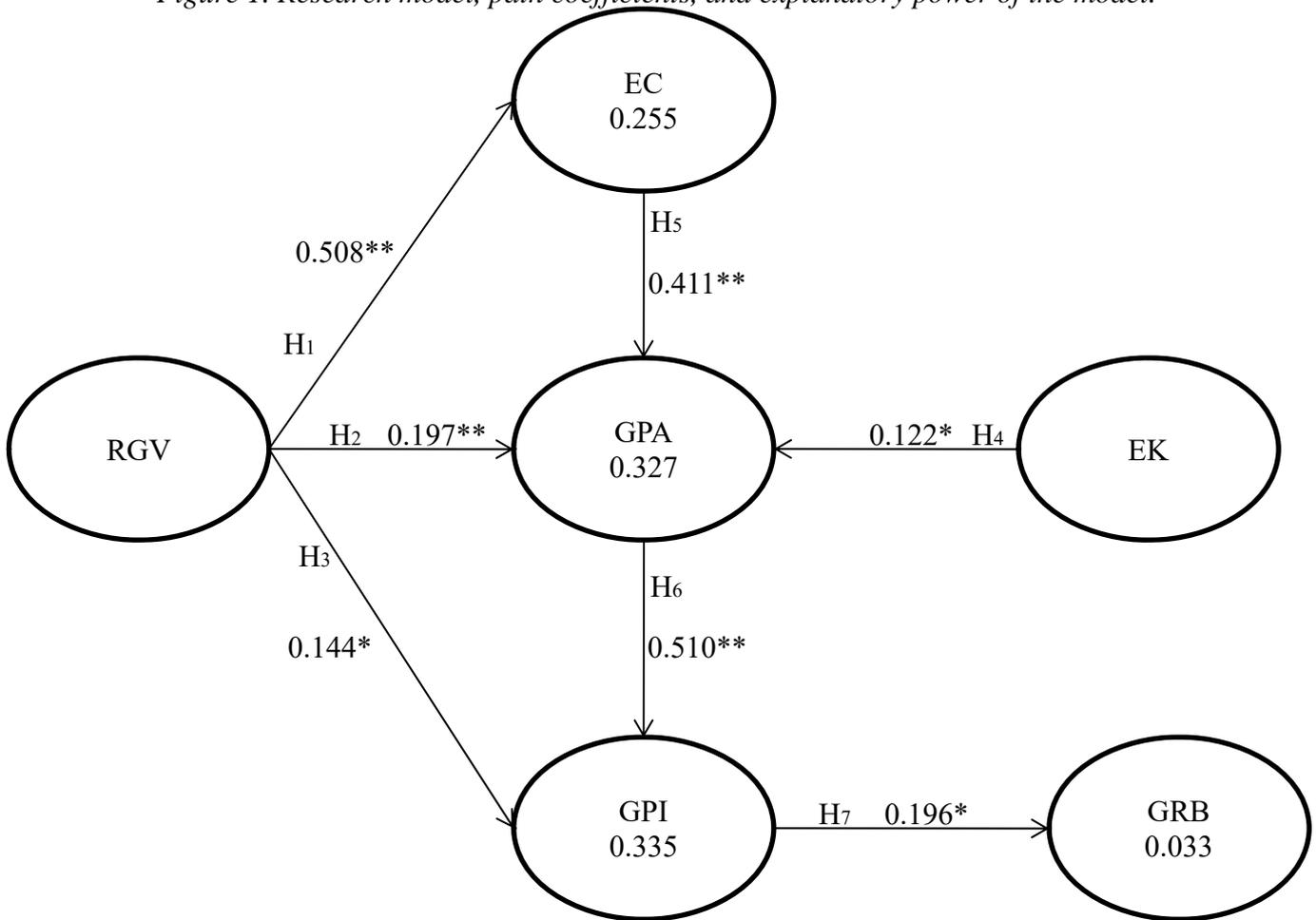
	EC	EK	GPA	GPI	GRB	RGV
EC						
EK	0.320					
GPA	0.631	0.264				
GPI	0.563	0.374	0.621			
GRB	0.136	0.216	0.135	0.200		
RGV	0.580	0.149	0.458	0.396	0.186	

Note: EC = Environmental concerns; EK = Environmental knowledge; GPA = Green purchase attitudes; GPI = Green purchase intentions; GRB = Green purchase behaviours; RGV = Religious values

Structural model

Evaluations of path coefficients (standard beta), standard error, corresponding t-values, effect sizes (f^2), explanatory power (R^2), predictive capability (Q^2), and variance inflation factor (VIF) are shown in Table 5. The statistical significance of a path coefficient was assessed by looking at the values of standard errors and t-statistics produced from the bootstrapping procedure with 5000 resamples (Henseler *et al.*, 2009). Figure 1 shows path coefficients and explanatory power in the model.

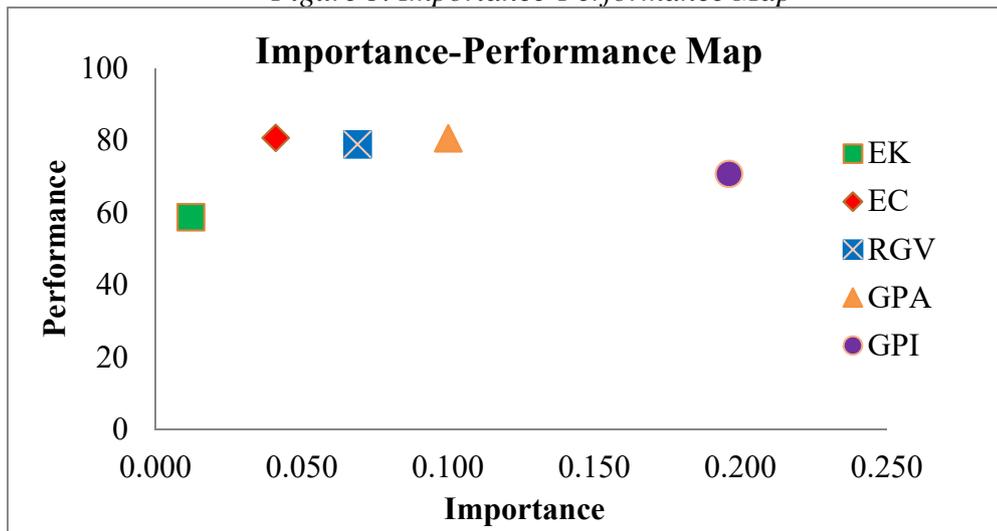
Figure 1. Research model, path coefficients, and explanatory power of the model.



Note: t-values > 1.645* ($p < 0.05$); t-values > 2.33** ($p < 0.01$); RGV = Religious values; EC = Environmental concerns; EK = Environmental knowledge; GPA = Green purchase attitudes; GPI = Green purchase intentions; GRB = Green purchase behaviours

Standard betas in Figure 1 suggest two interesting findings. First is wide difference between beta values for the GPA-GPI (H6) and GPI-GRB (H7) links. It indicates that although GPA translates effectively into GPI, the translation of GPI into GRB is very low. Second is the high beta value of RGV in comparison to EK. Figure 3 captures the importance-performance map analysis (IPMA) with GRB as the target construct. This analysis contrasts the total effects (importance) and the average values of the construct scores (performance) in the structural model (Hair *et al.*, 2014). Based on Figure 3, GPI is observed to be the most critical factor in determining GRB. An increase of one point in the performance of GPI leads to an increase in the performance of GRB by a total effect of 0.196 (Appendix A). RGV has a considerably higher performance and importance than EK.

Figure 3. Importance-Performance Map



Note: EK = Environmental knowledge; EC = Environmental concerns; RGV = Religious values; GPA = Green purchase attitudes; GPI = Green purchase intentions

Regarding the explanatory power of the model, GPA, GPI, and GRB are explained by 32.7%, 33.5%, and 3.3% of the variance, respectively (Figure 1 and Table 5). The model presents three substantial and one weak explanatory power. This assessment is based on Cohen (1988), who suggests that R^2 values of 0.26, 0.13, and 0.02 represent substantial, moderate, and weak explanatory power, respectively.

Table 5: Results of the structural model analysis (hypothesis testing)

Hypothesis	Relationship	Std Beta	Std Error	t-value	Decision	VIF	f^2	R^2	Q^2
H1	RGV -> EC	0.508	0.063	8.029**	Supported	1.000	0.349	0.255	0.160
H2	RGV -> GPA	0.197	0.082	2.408**	Supported	1.355	0.043	0.327	0.237
H3	RGV -> GPI	0.144	0.069	2.106*	Supported	1.210	0.026	0.335	0.239
H4	EK -> GPA	0.122	0.056	2.166*	Supported	1.094	0.020		
H5	EC -> GPA	0.411	0.091	4.514**	Supported	1.464	0.174		
H6	GPA -> GPI	0.510	0.067	7.633**	Supported	1.210	0.327		
H7	GPI -> GRB	0.196	0.091	2.146*	Supported	1.000	0.040	0.033	0.011

Note: t-values > 1.645* ($p < 0.05$); t-values > 2.33** ($p < 0.01$)

Shown in Table 5, all hypotheses were supported and significant, with p-values less than 0.05 and 0.01. In addition to statistical significance, results also suggest substantive significance (effect size, f^2). Cohen (1988) argues that f^2 values of 0.02, 0.15, and 0.35 indicate weak, moderate, and strong effects, respectively. Therefore, relationships in this study suggest substantive impact with one strong, two moderate, and four weak effects. This study assessed predictive capability of the model using the blindfolding procedure (Hair *et al.*, 2014; Henseler *et al.*, 2009), results suggest that all four endogenous constructs achieved predictive relevance because their respective Q^2 were greater than zero (Hair *et al.*, 2014). Multicollinearity was also assessed. Acceptable value of VIF should be less than 3.3 (Picón *et al.*, 2014; Diamantopoulos & Sigauw, 2006), 5 (Hair *et al.*, 2014), or 10 (Henseler *et al.*, 2009). In this study, the VIF values ranged from 1 to 1.464, so none of them was greater than 3.3, suggesting no multicollinearity problem between indicators.

Discussion

Theoretical implications

This study contributes to the literature in several ways. First, this study found that religious value significantly and positively influences green purchase behaviours. RGV significantly

affects GPA directly and indirectly through mediation by EC. GPA predicts GPI, which in turn affects GRB. Consequently, these findings provide empirical support to the Values-Attitude-Behaviour hierarchy and TRA, particularly attitudinal components, and its applicability to predict green purchase behaviours of Muslim consumers. Second, this study corroborates the applicability of a multidimensional RGV construct in the context of Muslim consumers. For RGV, formative dimensions are more appropriate since not all dimensions of RGV correlated highly. Particularly, quest had a low correlation with the extrinsic dimension, and a negative correlation with the intrinsic dimension (Appendix B). In addition, no multicollinearity problem between RGV dimensions, with VIF values less than 3.3 (Table 2). Third, outcomes suggest that multiple determinants influence GRB. From strongest to lowest, GPI, GPA, RGV, EC, and EK were predictors of GRB (Appendix A, Figure 3). Findings also suggest that purchases of green products involve cognitive and affective decision-making. Before making a purchase decision, consumers might search for product information and evaluate all alternatives, or simply buy green products based on religious beliefs.

Practical implications

In addition to the theoretical contributions outlined above, the outcomes of this study also have practical implications. Findings suggest the important role religion play in green purchase behaviours. RGV predicted GRB better than EK (Figure 1, Figure 1, Table 5, Appendix A). RGV positively influenced GRB, which suggests that consumers who are more religious are more likely to purchase green products. Muslim consumers will be looking for products that not only satisfy their needs and wants but also give them a 'peace of mind' (i.e., buying green products over non-green products are ways to practice Islamic teachings because it protects the environment). This finding reminds marketers of the importance of preserving religious value. Marketers involved in green messaging should acknowledge religious value to avoid offending consumers who practise religion, for example by carefully selecting the language or emphasising religious behaviour. They should also make better use of religious value to advance green purchase behaviours by highlighting that green behaviours are part of religious teachings, and by engaging in them, consumers receive blessings from God. Emphasising religion might be beneficial to marketers because religion transcends geographic boundaries, providing applicability to marketers worldwide. Consequently, marketers should gain insights from consumer information because religious value is easy to ascertain through self-reports. Findings also suggest that consumers' knowledge influences green purchase behaviours. Messages that marketers convey in their green advertisements should appeal to consumers' rationality. Marketers should get involved in educating consumers on the importance of environment protection, which indirectly boosting sales of green products and delivering the message that people's actions make a difference. In addition, the goodness and benefits of the products, particularly regarding the aspects of protecting the environment and promoting sustainability, should be emphasized and reinforced on the packaging of green products to disseminate knowledge and information. This (environmental) knowledge is important to influence consumer attitudes and intentions to engage in green purchases.

The low beta value of 0.196 between GPI and GRB deserves special attention because it is much lower than the beta value between GPA and GPI, which was 0.510. This gap might be attributed to barriers to green purchases, as extant literature suggests (Gleim *et al.*, 2013; Tanner & Kast, 2003). Examples include consumers' low-incomes (or green products priced expensively), perceptions that green products offer inferior performance or are lower quality, consumers' lack of trust in the greenness of a product (and the organisation that produces it), and unavailability of green products in Muslim society in comparison to developed countries. This study provides insights for green marketers to tailor strategies that advance green purchase behaviours, particularly eliminating or reducing barriers. They should employ integrated marketing strategies such as targeting only middle- and high-income consumers (or minimising production and distribution costs to sell green products at a lower price), effective

advertisements to change consumers' perception towards green products' quality, involvement in environmental causes to improve a company's image, and partnerships/alliances with distributors/channels in Muslim countries.

Finally, local governments should take initiatives to protect the environment by implementing effective environmental policies, and should expedite green purchases through legislation, requiring companies to include green policies in their long-term strategies.

Conclusions

This study suggests that religious value positively affects green purchase behaviours by mediation from environmental concerns, green purchase attitudes, and green purchase intentions. In addition, green purchase attitudes and intentions mediate the relationship between environmental knowledge and green purchase behaviours (Appendix A). Based on their performance (total effects) religious value predicts green purchase behaviours better than environmental knowledge.

Limitations and future research

Several limitations are identified in this study. Social desirability bias from respondents' self-reports of past behaviours, or predictions about future acts, might have influenced findings. Future research should use alternative survey methods such as observations to achieve better understanding of green purchase behaviours. This study used cross-sectional data, which explains purchase behaviours of consumers at only a single point in time. Future research should use longitudinal designs that capture changes to consumer behaviours over time. This study used a quantitative method to investigate relationships among constructs. It is valuable, but is weak when identifying reasons for relationships. Future research should use qualitative methods along with quantitative methods so relationships among constructs can be explored further. Since the multidimensional RGV construct has not been employed as often as other constructs have in environmental and marketing research, especially in Asian and Muslim nations, future research should test its reliability and validity across samples. Other variables could be integrated into the model to examine the predictive power of green purchase behaviours such as consumers' habit and perceived value (functional, economical, emotional, and social values).

References

- Ajzen, I., 1991. The Theory of Planned Behavior. *Organizational Behavior and Human Decision Processes*, 50(2), pp.179–211.
- Allport, G.W. & Ross, J.M., 1967. PERSONAL RELIGIOUS ORIENTATION AND PREJUDICE. *Journal of Personality and Social Psychology*, 5(4), pp.432–443.
- Antonetti, P. & Maklan, S., 2014. Feelings that Make a Difference: How Guilt and Pride Convince Consumers of the Effectiveness of Sustainable Consumption Choices. *Journal of Business Ethics*, 124(1), pp.117–134.
- Banerjee, S., Gulas, C.S. & Iyer, E., 1995. Shades of Green: A Multidimensional Analysis of Environmental Advertising. *Journal of Advertising*, 24(2), pp.21–31.
- Batson, C.D., Schoenrade, P.A. & Schoenradet, P.A., 1991. Measuring Religion as Quest : 2) Reliability Concerns. *Journal for the Scientific Study of Religion*, 30(4), pp.430–447.
- Carrus, G., Passafaro, P. & Bonnes, M., 2008. Emotions, Habits and Rational Choices in Ecological Behaviours: The Case of Recycling and Use of Public Transportation. *Journal of Environmental Psychology*, 28(1), pp.51–62.
- Cepeda-Carrion, I. et al., 2016. Absorptive Capacity and Value in the Banking Industry: A Multiple Mediation Model. *Journal of Business Research*, 69(5), pp.1644–1650.
- Chan, R.Y.K., 2001. Determinants of Chinese Consumers' Green Purchase Behavior. *Psychology and Marketing*, 18(4), pp.389–413.
- Chan, R.Y.K. & Lau, L.B.Y., 2000. Antecedents of Green Purchases: A Survey in China. *Journal of consumer marketing*, 17(4), pp.338–357.

- Chen, Y., 2010. The Drivers of Green Brand Equity: Green Brand Image, Green Satisfaction, and Green Trust. *Journal of Business Ethics*, 93(2), pp.307–319.
- Cho, Y.N. et al., 2013. To be or not to be Green: Exploring Individualism and Collectivism as Antecedents of Environmental Behavior. *Journal of Business Research*, 66(8), pp.1052–1059.
- Cleveland, M. & Chang, W., 2009. Migration and Materialism: The Roles of Ethnic Identity, Religiosity, and Generation. *Journal of Business Research*, 62(10), pp.963–971.
- Cohen, J., 1988. *Statistical Power Analysis for the Behavioral Sciences* 2nd Ed., Hillsdale, NJ: Lawrence Erlbaum.
- Cronin, J.J. et al., 2011. Green Marketing Strategies: An Examination of Stakeholders and the Opportunities They Present. *Journal of the Academy of Marketing Science*, 39(1), pp.158–174.
- Diamantopoulos, A. et al., 2003. Can Socio-demographics Still Play a Role in Profiling Green Consumers? A Review of the Evidence and an Empirical Investigation. *Journal of Business Research*, 56(6), pp.465–480.
- Diamantopoulos, A. & Siguaw, J.A., 2006. Formative versus reflective indicators in organizational measure development: A comparison and empirical illustration. *British Journal of Management*, 17(4), pp.263–282.
- Dunlap, R.E. et al., 2000. Measuring Endorsement of the New Ecological Paradigm: A Revised NEP Scale. *Journal of Social Issues*, 56(3), pp.425–442.
- Felix, R. & Braunsberger, K., 2016. I Believe Therefore I Care: The Relationship between Religiosity, Environmental Attitudes, and Green Product Purchase in Mexico. *International Marketing Review*, 33(1), pp.330–347.
- Fornell, C. & Larcker, D., 1981. Evaluating Structural Equation Models with Unobservable Variables and Measurement Error. *Journal of marketing research*, 18(1), pp.39–50.
- Gleim, M.R. et al., 2013. Against the Green: A Multi-method Examination of the Barriers to Green Consumption. *Journal of Retailing*, 89(1), pp.44–61.
- Haanpää, L., 2007. Consumers' Green Commitment: Indication of a Postmodern Lifestyle? *International Journal of Consumer Studies*, 31(5), pp.478–486.
- Hair, J.F.J. et al., 2014. *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)*,
- Hassan, S.H., 2014. The Role of Islamic Values on Green Purchase Intention. *Journal of Islamic Marketing*, 5(3), pp.379–395.
- Henseler, J., Ringle, C.M. & Sarstedt, M., 2015. A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science*, 43(1), pp.115–135.
- Henseler, J., Ringle, C.M. & Sinkovics, R.R., 2009. The Use of Partial Least Squares Path Modeling in International Marketing. *Advances in international marketing*, 20(1), pp.277–319.
- Hills, P., Francis, L.J. & Robbins, M., 2005. The Development of the Revised Religious Life Inventory (RLI-R) by Exploratory and Confirmatory Factor Analysis. *Personality and Individual Differences*, 38(6), pp.1389–1399.
- Homer, P.M. & Kahle, L.R., 1988. Value Attitude Behavior Hierarchy. *Journal of Personality and Social Psychology*, 54(4), pp.638–646.
- Hulland, J., 1999. Use of Partial Least Squares (PLS) in Strategic Management Research: A Review of Four Recent Studies. *Strategic Management Journal*, 20(2), pp.195–204.
- Jarvis, C.B., MacKenzie, S.B. & Podsakoff, P.M., 2003. A Critical Review of Construct Indicators and Measurement Model Misspecification in Marketing and Consumer Research. *Journal of Consumer Research*, 30(2), pp.199–218.
- Johnstone, M.L. & Tan, L.P., 2015. Exploring the Gap Between Consumers' Green Rhetoric and Purchasing Behaviour. *Journal of Business Ethics*, 132(2), pp.311–328.
- Kilbourne, W., Beckmann, S. & Thelen, E., 2002. The Role of the Dominant Social Paradigm in Environmental Attitudes: A multinational Examination. *Journal of Business Research*, 55(3), pp.193–204.

- Kilbourne, W. & Pickett, G., 2008. How Materialism Affects Environmental Beliefs, Concern, and Environmentally Responsible Behavior. *Journal of Business Research*, 61(9), pp.885–893.
- Kim, Y. & Choi, S.M., 2005. Antecedents of Green Purchase Behaviour: An Examination of Collectivism, Environmental Concern, and PCEE. *Advances in Consumer Research*, 32(1), pp.592–599.
- Laroche, M., Bergeron, J. & Barbaro-Forleo, G., 2001. Targeting Consumers who are Willing to Pay More for Environmentally Friendly Products. *Journal of consumer marketing*, 18(6), pp.503–520.
- Lewis, C.A. et al., 2001. The Santa Clara Strength of Religious Faith Questionnaire. *Pastoral Psychology*, 49(5), pp.379–384.
- Lindridge, A., 2005. Religiosity and the Construction of a Cultural-consumption Identity. *Journal of Consumer Marketing*, 22(3), pp.142–151.
- Ling-ye, L., 1997. Effect of Collectivist Orientation and Ecological Attitude on Actual Environmental Commitment: the Moderating Role of Consumer Demographics and Product Involvement. *Journal of International Consumer Marketing*, 9(4), pp.31–53.
- Minton, E.A., Kahle, L.R. & Kim, C.H., 2015. Religion and Motives for Sustainable Behaviors: A Cross-cultural Comparison and Contrast. *Journal of Business Research*, 68(9), pp.1937–1944.
- Moser, A.K., 2016. Consumers' Purchasing Decisions Regarding Environmentally Friendly Products: An Empirical Analysis of German Consumers. *Journal of Retailing and Consumer Services*, 31, pp.389–397.
- Mostafa, M.M., 2007. A Hierarchical Analysis of the Green Consciousness of the Egyptian Consumer. *Psychology & Marketing*, 24(5), pp.445–473.
- Nair, S.R. & Little, V.J., 2016. Context, Culture and Green Consumption: A New Framework. *Journal of International Consumer Marketing*, 28(3), pp.169–184.
- Paul, J., Modi, A. & Patel, J., 2016. Predicting Green Product Consumption Using Theory of Planned Behavior and Reasoned Action. *Journal of Retailing and Consumer Services*, 29, pp.123–134.
- Peattie, K., 2010. Green Consumption: Behavior and Norms. *Annual Review of Environment and Resources*, 35(1), pp.195–228.
- Picón, A., Castro, I. & Roldán, J.L., 2014. The Relationship between Satisfaction and Loyalty: A Mediator Analysis. *Journal of Business Research*, 67(5), pp.746–751.
- Plante, T.G. & Boccaccini, M.T., 1997. The Santa Clara Strength of Religious Faith Questionnaire. *Pastoral Psychology*, 45(5), pp.375–387.
- Polites, G.L., Roberts, N. & Thatcher, J., 2012. Conceptualizing Models Using Multidimensional Constructs: A Review and Guidelines for Their Use. *European Journal of Information Systems*, 21(1), pp.22–48.
- Ramayah, T., Lee, J.W.C. & Mohamad, O., 2010. Green Product Purchase Intention: Some Insights from a Developing Country. *Resources, Conservation and Recycling*, 54(12), pp.1419–1427.
- Roberts, J.A., 1996. Green Consumers in the 1990s: Profile and Implications for Advertising. *Journal of Business Research*, 36(3), pp.217–231.
- Sparks, P. & Shepherd, R., 1992. Self-Identity and the Theory of Planned Behavior : Assessing the Role of Identification with “Green Consumerism.” *Social Psychology Quarterly*, 55(4), pp.388–399.
- Straughan, R.D. & Roberts, J.A., 1999. Environmental Segmentation Alternatives: A Look at Green Consumer Behavior in the New Millennium. *Journal of Consumer Marketing*, 16(6), pp.558–575.
- Tanner, C. & Kast, S.W., 2003. Promoting Sustainable Consumption: Determinants of Green Purchases by Swiss Consumers. *Psychology and Marketing*, 20(10), pp.883–902.
- Taylor, S. & Todd, P., 1995. Decomposition and Crossover Effects in the Theory of Planned

- Behavior: A Study of Consumer Adoption Intentions. *International Journal of Research in Marketing*, 12(2), pp.137–155.
- The Forum on Religion and Public Life, T.P.R.C., 2009. *Mapping the Global Muslim Population*, Available at: <http://www.pewforum.org/2009/10/07/mapping-the-global-muslim-population/>.
- Thøgersen, J., Jørgensen, A. & Sandager, S., 2012. Consumer Decision-making Regarding a “Green” Everyday Product. *Psychology and Marketing*, 29(4), pp.187–197.
- Vaske, J.J. & Donnelly, M.P., 1999. A Value – Attitude – Behavior Model Predicting Wildland Preservation Voting Intentions. *Society & Natural Resources*, 12(6), pp.523–537.
- Zimmer, M.R., Stafford, T.F. & Stafford, M.R., 1994. Green Issues: Dimensions of Environmental Concern. *Journal of Business Research*, 30(1), pp.63–74.

Appendix

Appendix A. Mediation Effect and Importance-Performance Matrix

From	To	Direct effect	Indirect effect	Total effect	Performance
RGV	EC	0.508		0.508	79
	GPA	0.197	0.209	0.406	
	GPI	0.144	0.207	0.351	
	GRB		0.069	0.069	
EK	GPA	0.122		0.122	59
	GPI		0.062	0.062	
	GRB		0.012	0.012	
EC	GPA	0.411		0.411	81
	GPI		0.210	0.210	
	GRB		0.041	0.041	
GPA	GPI	0.510		0.510	81
	GRB		0.100	0.100	
GPI	GRB	0.196		0.196	71

Appendix B. Correlation between RGV dimensions

	EXT	INT	QUE
EXT			
INT	0.708		
QUE	0.031	-0.070	
RGV	0.784	0.993	-0.077