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DOES MUSLIM CONSUMERS PURCHASE GREEN COSMETICS? A PLS-SEM APPROACH

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Abstract:

A high Muslim population significantly impact on green purchase behavior (GPB). Examining this phenomenon enhances the understanding of GPB among Muslim consumers, particularly in green cosmetics. The aim of the study is to examine the interrelationship between values, personal norms and GPB. Additionally, it assesses the mediating role of personal norms in values-GPB relationship. Grounded in the Value-Belief-Norm theory, the present study employed a judgmental sampling technique for data collection. By using structural equation modeling approach, 258 usable online responses were gathered and analyzed through SmartPLS software. The findings of the study indicate positive results for all relationships. Specifically, both altruistic and hedonic values positively influence personal norms, which, in turn, positively impact GPB. Positive mediating role has been gathered, confirming personal

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norms as a mediator in values-GPB relationship. These findings provide valuable insights for marketers in developing more attractive and competitive marketing strategy tailored to consumers' religious background. Specifically, they highlight the potential for green cosmetics marketers to target Muslim consumers, who possess strong purchasing power. Moreover, the findings raise consumers' awareness of the importance of green attributes when purchasing cosmetic products.

Keywords:

Altruistic Value, Cosmetic Products, Green Purchase Behavior, Hedonic Value, Personal Norm

Introduction

The global Muslim population is reported to exceed over two billion, with Malaysia accounting for over 60 per cent of its population as Muslims, totaling more than 20 million (World Population Review, 2024). As a dominant religious group in Malaysia, Muslim purchase behavior indirectly affects environmental wellbeing as they hold strong purchasing power as compared to other religious groups. This is proven by past research stated that Muslims are considered as an influential group due to high population recorded and it is estimated to become the largest population in 2050 (Lipka & Hackett, 2017). In this context, analyzing green purchase behavior (GPB) from a Muslim perspective has a profound impact on both the environment and human well-being.

Generally, green purchase behavior (GPB) emphasizes on the environmental aspects where the products' bought are favorable to the environment that can be recycled, conserved, sensitive and responsive towards the ecological matters (Mostafa, 2007). Previous studies have confirmed that green purchase behavior can be one analytical resolution in achieving environmental sustainability (Jaini et al., 2020). As a matter of fact, the study of GPB has received substantial research considerations from numerous research contexts including e-commerce purchase (Sharma & Paco, 2025), the usage of electric car (Barbarossa et al., 2017), organic food purchase (Liu et. al, 2025), oil and gas industries (Nazeer et al., 2025), marine ecotourism (Gao et al., 2023) as well as organizational green performance (Zafar et al., 2025). Moreover, depth research on the effect of religiosity toward halal buying behavior also has been discovered in the past research (Aslan et al., 2023; Ali et al., 2020; Ismail, 2025; Tuhin et al., 2020). However, limited research that has been conducted in examining green purchase behavior from the perspective of Muslim consumers, particularly in the context of green cosmetics. Understanding the purchasing behavior of Malaysia's largest demographic group, which is Muslim consumers is essential, as their high level of cosmetic consumption significantly impacts the environment, health, and the global market. In light of this, there is a need to explore this matter further to understand green buying behavior from a Muslim perspective.

According to the Islamic law, the key characteristics to consider in purchasing are cleanliness, safety and quality, ensuring that the product has no harmful effects on the body (Tuhin et al., 2020). Apart from that, prior research has found that religion is an important cultural influence that forms their behavior in purchase decision (Alam et al., 2011). With regards to cosmetic products, its normally contains chemical substances that consist of triphenyl, mercury, tretinoin, propylparaben, phosphate, petroleum, phthalates, and hydroquinone (Abdullah,

2018). All these chemicals are added to expedite the effect of cosmetics on consumers' skin and body. Nevertheless, high consumption with long term period may cause give severe effect on the health of consumers' either minimal effect such as hair problems, acne, headaches, skin allergies, and also other critical illnesses like cancer, kidney failure and can also cause death. Furthermore, the waste of these chemical products also gives dangerous effect to the environment where it affects the aquatic and global environment due to the toxic waste destroyed the plant and animal species (Jardak et al., 2016). Due to these critical matters, moving into green cosmetics is an urgent call for every consumer worldwide. Thus, examining green purchase behavior through the lens of religiosity can broaden research on green buying behavior by offering a unique perspective.

Additionally, a study on environmental issues with regard to individual behavior has been carried out by adapting various theoretical approaches (Aslan, 2023; Han et al., 2019). One of the theories that frequently used in measuring pro-environmental behavior is the Value-Belief-Norm theory (Jaini et al., 2020; Karpudewan, 2019; Zhang et al., 2020). According to VBN theory, the main indicators in shaping consumers' belief and norms are values that ultimately influencing their environmentally conscious action. Moreover, the sudden attach of COVID 19 pandemic has drastically shifted consumer behavior, with online purchasing emerging as a primary medium. During the pandemic, 55 per cent of consumers demonstrated a higher intention to shop online compared to pre-pandemic levels (UOW Malaysia KDU, 2020). Additionally, the growing acceptance of social media become a key platform for consumers to share and discuss their shopping experiences. Given these developments, this study adapting VBN theory as the direction of this study to examine Muslim green purchase behavior in cosmetic product purchase.

Literature Review

Value-Belief-Norm Theory

The sustainable Value-Belief-Norm (VBN) theory addresses ecology and environmental behavior that focus on the shifts in societal attitudes and behaviors (Stern et al., 1999). This framework highlights the formation of pro-environmental behavior based on three key components that consist of values, beliefs and personal norms. Pro-environmental behaviors are further classified into four main components that consist of private-sphere behaviors, organizational behaviors, non-activist public sphere behaviors and activism. Therefore, green purchase behavior falls under private-sphere behaviors indicating a person obligation to act sustainably was driven by strong environmental values and beliefs to purchase and consume natural products.

Specifically, VBN theory was formulated based on the influence of personal values, which shape a set of beliefs and in turn, influence personal norm and foster a tendency to turn their behavior into environmentally responsible ways. Initially, the formation of values was derived based on four main types, which are self-transcendence, self-enhancement value, traditional values and openness to change value. Self-transcendence is associated with altruistic value, while self-enhancement relates to egoistic value. Later, Stern (2000) revised this framework in response to the evolution of environmental action, identifying altruistic, biospheric and egoistic values as key drivers of pro-environmental belief.

However, past research has found another value that is important in measuring pro-environmental behavior. The value emerged when some people refuse to act environmentally even though they know the benefit of doing so. This kind of resistance is developed when pro-environmental action gives threats to personal benefits other than egoistic values such as the feeling of comfort and pleasure, which is called as hedonic value (Steg et al, 2014). Sharing a car or using public transport is a positive effort to reduce gas emission and reduce air pollution. However, to some extent this action may cause uncomfortable feeling among individuals. Thus, this feeling is considered as hedonic value that may prevent someone from environmental action because of his or her personal feeling. From the perspective of green cosmetics, there is a need to explore this value further to understand consumers' feeling due to most consumers emphasize on satisfaction and comfort when consume cosmetic products. Following this justification, this study adapted VBN theory and examines the relationship between personal norms and green purchase behavior with altruistic and hedonic value as the influential factors in the context of cosmetic purchases.

Relationship Between Values And Personal Norm

VBN theory formulated the interrelationship between values, beliefs and norms that encourage pro-environmental behaviors either individually or in an organization (Stern, 2000). One of value that highlighted in this theory is altruistic value where it related to feelings to protect the environment and express a concern for others with regards to saving the earth (Swami et al., 2010). Past research has found significant relationship of altruistic value on New Environmental Paradigm (NEP) that give threats on the consequences of their action and thus give them a signal to take the corrective action (Lopez-Mosquera & Sanchez, 2012; Stern, 2000). Altruistic value has been discovered as an influential factor of beliefs in ecological worldview that direct environmental human behavior on choosing green cars among Pakistanis (Saleem et al., 2021). The positive correlation between altruistic value and beliefs also supported by Chawla et al. (2024), indicate that altruistic value significantly affects waste management behavior among Indian. The exploration of altruistic value in buying cosmetic products can expand the findings from past literatures. Thus, it is assumed that altruistic value can influence Muslim consumers' personal obligation to buy green cosmetics. Thus, according to this this postulation, the present study hypothesized:

H1: Altruistic value positively influences personal norm among Muslim consumers.

In original enhancement of VBN theory by Stern (2000) indicate that self-enhancement was deliberately derive based on altruistic and biospheric values. However, a part from these values, Steg et al. (2014) identified another value that should be considered in measuring pro-environmental behavior among consumers. Hedonic value plays an additional function in understanding the environmental actions among consumers where the purchase and consumption of goods arouse the emotions of individuals to make purchase decision. Furthermore, other research has found that hedonic value is the strongest value that influences consumers' green purchase behavior in organic personal care context as compared to the other values such as health, safety, social and environmental value (Ghazali et al, 2017). Therefore, from the perspective of cosmetics purchasing, this study assumes that hedonic value may influence Muslim consumers to buy green cosmetics, as Islam encourage the consumption of product that are safe, clean and beneficial to the body (Ab Talib & Ai Chin, 2018). According to this notion, following hypothesis is developed:

H2: Hedonic value positively affects personal norm among Muslim consumers.

Personal Norm As A Mediator In Values-Green Purchase Behavior Relationship

In original VBN theory has markedly discussed the norm and behaviors relationship toward environmental issues with the anticipation of individual values and beliefs. Greater pro-environmental behaviors are related to higher obligation to conserve the environment with the influence of value orientations that lead to belief in environmental action (Chen, 2015; Stern, 2000). Prior research has found significant relationship between environmental values and personal norm in the context of climate change behaviors (Karpudewan, 2019). Additionally, this direct relationship also been tested and prove to be significant in sustainability crowd funding context (Kim & Hall, 2021). Consequently, past research also found positive setting in personal norms and behavior relationship for other pro-environmental behaviors. For example, Aasen and Vatn (2018) have found positive correlation in public sphere behavior, while Ture and Ganesh (2018) in organizational behaviors and Hartmann et al. (2018) in private severe behavior. Based on past findings, personal norms are expected to mediate values-green purchase behavior relationship. Based on this assumption, the following hypotheses are constructed:

H4: Personal norm mediates the relationship between altruistic value and green purchase behavior.

H5: Personal norm mediates the relationship between hedonic value and green purchase behavior.

Conceptual Framework

Figure 1 presented the conceptual framework constructed in the study.

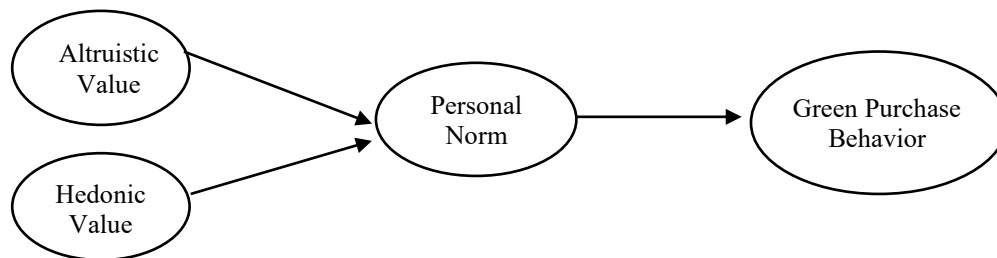


Figure 1: Conceptual Framework

Methodology

The present study utilizes correlational study under quantitative research design with non-probability method was design to collect the research data. By using judgmental sampling technique, online survey was distributed to public with cross sectional setting. Two screening questions were created to ensure only specific responses were gathered that meet criteria of the study. Those who are Muslim and have experience purchase green cosmetics were required to complete the survey and others who are not fulfill these criteria were required to submit the survey immediately. This setting fulfills the requirement of the judgmental sampling technique (Cavana, et al., 2001). Regarding the instrument of the study, a set of questionnaires was designed into three section, where screening question is in the first section, demographic profile in second section and questions for all variables in the third section. All questions are adapted from past studies with minimal amendment to suit with the study context (green cosmetics).

Altruistic value was adapted from Izagirre-Olaizola et al. (2015), hedonic value was adapted from Ghazali et al. (2017), personal norm and green purchase behavior were adapted from Khare (2015). 5-point Likert scale was used in questionnaire setting with 1= “strongly disagree” and 5 = “strongly agree”.

Research Design

For answering the research objectives, the study opts for correlational design and distributed a web link through Google doc to collect data from respondents. Online survey was utilized due to the researcher has a potential to collect bigger responses efficiently, economically, and within short period of times. Furthermore, the uses of Internet are able to reduce error and avoid missing data due to the question can be set as required to allow the respondents submit the survey (Hair et al., 2014). Before data collection was conducted, the draft questionnaire was submitted to three renowned professors for content validity purpose. Then, after correcting the questionnaire, the present study distributes to 20 college students for pretest to confirm the legibility and comprehensibility of items. Subsequently, the research proceeded with 100 sample of consumers for pilot testing. Based on 83 responses collected, modifications were to enhance the clarity of all questions and address any potential reliability issues. SPSS software was used to analyze the data. From the results, it showed that Cronbach's α values above 0.7 for all variables, confirming that the data were ready for final data collection.

Sample Size

The study utilized judgmental sampling technique under non-probability due to the researcher has specific requirements in data collection procedure. Only Muslim consumers who already experienced buying green cosmetic products before are required to answer the whole questions. This technique was used because getting a complete list of population seemed impossible, making the choice of non-probability sampling appropriate for the study (Cavana et al., 2001). Regarding sample size calculation, this study used GPower software to calculate gather minimum sample size as suggested by Faul et al. (2007). Therefore, based on GPower calculation, the results required a minimum of 77 responses for two maximum indicators, based on 0.80 statistical power with a 5 per cent probability of error. Overall, the final usable responses collected in this study totaled 258, meeting the requirement for minimum sample size.

Data Analysis

Respondents' Profile

The data analysis begins with the analysis of demographic data for 258 respondents. The analysis categorizes into gender, age, education, the range of income, race, marital status as well as their occupation background. As shown in Table 1, 56 respondents were male with 21.7 per cent and 202 respondents were female with 78.3 per cent. For age, most respondents (115 responses) were between 31 to 35 years old with 44.6 percent. Meanwhile, for educational background, most respondents hold Bachelor Degree with 100 responses equivalent with 38.8 per cent. Furthermore, most of respondents are married with percentage of 63.2 per cent and have professional working experience with 42.6 per cent. Last but not least, the highest group for income level was between RM2001 to RM3500 with 32.2 per cent.

Table 1: Demographic Profile

Demographics	Number of respondents (N=258)	Percentage (%)
Gender		
Male	56	21.7
Female	202	78.3
Age		
18-25	48	18.6
26-30	54	20.9
31-35	115	44.6
36-40	41	15.9
Education		
PMR/SPM	41	15.9
Certificate/Diploma	44	17
Bachelor Degree	100	38.8
Master Degree	60	23.3
PhD	13	5
Marital Status		
Single	92	35.7
Married	163	63.2
Divorce	3	1.2
Occupation		
Housewife	10	3.9
Self-employed	8	3.1
Entrepreneur	6	2.3
Professional	110	42.6
Non-professional	77	29.8
Retired	1	0.4
Student	46	17.8
Monthly Income		
Less than RM500	35	13.6
RM501-RM2000	45	17.1
RM2001-RM3500	83	32.2
RM3501-RM5000	55	21.3
RM5001-RM6500	30	11.6
More than RM6501	11	4.3

Results

The study employed the SmartPLS software under Structural Equation Modelling (SEM) approach to analyze the hypotheses. The choice of the software is because the study attempts to predict the variance in the dependent variable, making structural equation modeling-partial least squares (PLS-SEM) a justified analytical tool. In data analysis process, SmartPLS software divided the analysis into measurement model, which assess the quality of data, and the structural model, which tested the hypotheses. Since the present study gathered data from a single source, which is green cosmetics consumers, there was a potential risk of bias in data collection. To address this issue, the present study applied procedural and statistical remedies to eliminate any potential bias. To mitigate common Method Variance (CMV) (Podsakoff & Organ, 1986) the researchers assured respondents of their anonymity and emphasize that there

were no right and wrong answer. These to method were procedural remedies. Additionally, for statistical remedies, Harman's Single Factor test was conducted, as suggested by Podsakoff et al. (2003). CMV occurs when one factor explained the majority of variance. CMV is a concern when a single factor accounts for the majority of the variance. The CMV results showed that, 39.41% of the total variance indicating low than the threshold of 50%, confirming that no bias was present in the data collection.

Measurement Model

Under measurement model, there are several criteria that must be followed to ensure all data was usable for hypotheses testing in structural model. The first criteria were indicating the factor loading values. Based on the rules of thumb, the values for all items must be higher than 0.708 (Hair et al., 2014). Item deletion was necessary for any values below the threshold. Then, composite reliability (CR) and AVE were other criteria that must be achieved in the analysis. CR value must higher than 0.80, and AVE value must be more than 0.5 to ensure the validity of data (Hair et al., 2017). Table 2 showed that two items, which are GPB1 and GPB2 has lower values and need to remove in dataset. Meanwhile, all values exceeding the minimum threshold for AVE and CR, confirming the fitness of the measurement model for the study. Once PLS algorithm requirement achieved the minimum requirement, the next analysis was identifying discriminant validity of data. Discriminant validity indicates to which extent each a construct is different from others in the conceptual model. Fornell-Larcker criterion is the most utilized method in identifying discriminant validity of data. It involves comparing the square root of AVE for each latent variable with the correlation of other constructs in the model. Table 3 demonstrated that the discriminant validity for data is achieved. Specifically, from the table it showed that the diagonal values for all constructs are greater than other values in raw and column (Fonell & Larcker, 1981) and thus, indicated the data was accepted.

Table 2: Mean, Standard Deviation, Loading, Cronbach's Alpha, CR and AVE

Construct	Items	Loadings	CR (> 0.7)	AVE (> 0.5)
AV	AV1	0.832	0.826	0.614
	AV2	0.774		
	AV3	0.742		
GPB	GPB2	0.858	0.893	0.678
	GPB3	0.876		
	GPB4	0.727		
	GPB5	0.824		
	GPB1	0.708		
HV	HV1	0.835	0.931	0.730
	HV2	0.843		
	HV3	0.882		
	HV4	0.885		
	HV5	0.857		
PN	PN1	0.835	0.884	0.717
	PN2	0.870		
	PN3	0.834		
	GPB3	0.876		
	GPB4	0.727		
	GPB5	0.824		

Note: M=Mean; SD=Standard Deviation, α = Cronbach's alpha; CR=Composite Reliability, AVE=Average Variance Extracted

Table 3: Discriminant Validity Result Using Fornell-Larcker Criterion

Construct	AV	GPB	HV	PN
AV	0.783			
GPB	0.686	0.823		
HV	0.687	0.638	0.854	
PN	0.634	0.559	0.687	0.847

Note: Diagonals Represent the Square Root of The Average Variance Extracted While Off-Diagonal Represent the Correlations

Structural Model

The study proceeds with structural model analysis to verify the study hypotheses. There are other criteria that must be assessed in analyzing the hypotheses results. For example, the explanatory power of the model (R^2) of 0.26 exert as a substantial, 0.13 as a moderate and 0.02 are correspondingly defined weak. According to Table 4, altruistic value presented R^2 values of 0.522 indicate substantial effect on personal norms. Similarly, hedonic value also exerts substantial effect on personal norms with R^2 values of 0.385. Additionally, personal norm also showed a substantial effect, which $R^2 = 0.385$ and exert a great amount of variance in green purchase behavior. With regards to the effect size (f^2), it determines the strength of relationship between variables (Hair et al., 2014). The effect size indicates small effect for the results of 0.02 and above, medium effect for 0.15 and above; and large effect for 0.35 and above (Cohen, 1988). Based on Table 4, both altruistic and hedonic values exert medium effect size on personal norms with value of $f^2 = 0.104$ for altruistic value and $f^2 = 0.251$ for hedonic value. Also, personal norm exerts a medium effect on GPB with $f^2 = 0.342$.

Next, the analysis continues with PLS bootstrapping procedures. 5,000 resample in bootstrapping was used to produce path coefficient and conforming t-values. One-tailed test was applied for all relationships due to positive direction in all hypotheses (Hair et al., 2014). The results presented significant if the value meet the minimum cut-off t-value of 1.645 for one-tailed test with 5% ($\alpha = 0.05$) (Ramayah et al., 2018). Based on Table 4, altruistic value significantly predicts personal norm, accepting H1 ($\beta = 0.307$, $t = 4.331$, $p < 0.01$). Similarly, hedonic value showed a positive value on personal norm, confirming H2 relationship ($\beta = 0.476$, $t = 7.496$, $p < 0.01$). Similarly, personal norm was significantly predicted GPB and H3 also accepted ($\beta = 0.479$, $t = 10.626$, $p < 0.01$).

The analysis of mediating effect was measured by conducting bootstrapping technique for indirect effect, 5000 resamples were chosen as recommended by Preacher and Hayes (2008). Bias-corrected bootstrap was chosen due to it is the best approach to detect mediating effect (Hayes & Scharkow, 2013). Based on Table 5, the results presented positive figures, confirming the role of personal norms in altruistic value – GPB relationship ($\beta = 0.147$, $t = 3.569$, $p < 0.01$). Similarly, the results also show positive results for personal norm in hedonic value – GPB relationship ($\beta = 0.228$, $t = 6.501$, $p < 0.01$). Overall, the findings accept both hypotheses H4 and H5.

Table 4: Structural Model Result (Direct Relationships)

Hypotheses	Relationship	Std Beta	Std Error	t-value	LL	UP	Decision	R ²	f ²
H1	AV -> PN	0.307	0.071	4.331	0.133	0.468	Supported	0.522	0.104
H2	HV -> PN	0.476	0.064	7.496	0.324	0.626	Supported		0.251
H3	PN -> GPB	0.479	0.045	10.626	0.365	0.579	Supported	0.385	0.342

Table 5: Structural Model Result (Indirect Relationships)

Hypotheses	Relationship	Std Beta	Std Error	t-value	LL	UP	Decision
H4	AV->PN->GPB	0.147	0.041	3.569	0.054	0.258	Supported
H5	HV->PN->GPB	0.228	0.035	6.501	0.143	0.325	Supported

Discussion and Conclusion

The aims for study were examining the antecedents of green purchase behavior in the cosmetics purchase's context among Muslim customers. Three direct relationships were hypothesized and analyzed between i) altruistic value and personal norm; ii) hedonic value and personal norm; and iii) personal norm and green purchase behavior. The results revealed that all predictive variables were significantly correlated with the dependent variables and thus, all direct hypotheses were supported. The results of this study were aligned with past studies findings in various research contexts (Harland et al., 2007; Nguyen et al., 2017; Steg et al, 2014). Specifically, altruistic value was found significantly correlated with Muslim's personal norm to purchase green cosmetics. Here, it showed that Muslim consumers have high concern on the environment and prefer green cosmetics as their preferred products.

In terms of hedonic value, the results showed that Muslim consumers exhibit high attention on their feelings of confidence and comfort while using green cosmetic and thus transform their purchase behavior into green cosmetics. The finding was aligned with past research in personal care purchase context where hedonic value was found to be the strongest value as compared to others values such as health, safety, social and environmental value (Ghazali et al., 2017). Additionally, the results indicate significant relationship between personal norm and green purchase behavior. It showed that Muslim consumers hold high obligation in performing green action as one of their responsibilities to conserve the environment as possible with the purchase of green products.

Additionally, the present study also indicates positive results in mediating effect. Specifically, positive relationship has been found in both mediating relationship between values (altruistic and GPB). Therefore, the findings of the study were also aligned with past research findings (Nguyen et al., 2017) and confirming the role of personal norms in VBN theory. Overall, the results of this study shed some light and enrich the existing literatures in GPB from the perspective of religious background, which are Muslim consumers. The study expands the insight of existing literature that mostly focus on green purchase behavior from different perspective. By utilizing structural equation modeling using PLS-SEM approach, the study provides significant findings for all direct and mediating relationships.

Limitations And Future Research Directions

The limitations gathered in this study can stipulate future research directions for the other researchers. For instance, this study was quantitatively conducted where survey instrument was utilized to collect data from respondents. Therefore, to enhance the outcome of green behavior

studies, future research can conduct a study by adapting qualitative method to gathered data from other perspective such as from green cosmetic experts such as pharmacists to give more insight in this context. The mixed method results can give more understanding in this matter deeper and enrich future literature. Furthermore, the findings were not generalized for other research areas and contexts due to the adaptation of non-probability sampling because of inability to gather a complete list of all respondents. Also, the present study gathers responses solely from Malay consumers. The choice of Malay consumers is because the Malays in Malaysia embraced Islamic religious and hold different values and belief as compared to other races such as Chinese and Indian. Therefore, future research can investigate green purchase behavior from other races in Malaysia to gain more insight from different cultures and races.

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