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A Study of Green Purchase Behavior in Malaysia: A mediation effect analysis based on the TPB

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Abstract

This investigation was done by a group of educated consumers residing in Malaysia. The Theory of Planned Behaviour (TPB) was used to study their behavior in purchasing green products. The study used PLS-SEM to conduct an online survey with 330 educated customers in Malaysia. The results showed that the link between green purchasing attitudes, subjective norms, perceived behavioral control, and green purchase behavior among educated Malaysian consumers was mediated by green purchasing intention. However, some of the results were different from previous findings. Perceived behavioral control would be significantly negatively related to green buying behavior. A green purchasing attitude has no direct effect on green buying behavior. This study provides a reference for relevant policymakers or green marketing strategies.

Keywords: Green purchase behavior; Educated consumers; Theory of Planned Behavior (TPB)

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1.0 Introduction

The presence of several global issues, such as climate change, resource depletion, and biodiversity loss, presents substantial risks to both human livelihoods and ecological equilibrium (Anser et al., 2021). Addressing these issues has become an urgent priority, despite the positive efforts of Malaysian government agencies and local businesses in environmental protection, the country is still struggling with severe ecological degradation (NM Suki et al., 2022). Malaysia is ranked eighth in the world in terms of contribution to environmental pollution (Greenpeace East Asia, 2019). Some studies have shown that the continuous growth of negligent consumption behavior is the root cause of escalating environmental problems (Biswas & Roy, 2015). Consumers' purchasing decisions and behaviors directly impact resource utilization, energy consumption, refuse generation, and emissions. With greater awareness of environmental issues, consumers are increasingly likely to choose green products with a smaller environmental footprint during production, use, and disposal (Ogiemwonyi et al., 2019).

However, despite an abundance of research on environmentally responsible consumer behavior in developed markets, studies in many emerging markets, including Asia, remain in their nascent stages (Perrea et al., 2014; Chan, 2018; Nekomahmud, 2020). Biswas and Roy (2015a, 2015b) have emphasized the need for more research to comprehend the developmental dynamics of pro-environmental consumer behavior in Asian regions. so, this study aims to explore green purchase behavior and its influencing factors among educated

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consumers in Malaysia using the Theory of Planned behavior (TPB). Specifically, this study will address the following research questions: 1) What factors influence the green purchase behavior of educated consumers in Malaysia? 2) Do these influencing factors mediate green purchase behavior through their impact on green purchase intentions?

2.0 Literature Review and Hypotheses

2.1 Overview of Previous Research

As of August 2023, 87 of the 203 relevant green purchasing behavior (GPB) studies screened in Scopus are based on solid theoretical foundations, such as the consumer socialization theory (CST), the theory of reasoned action (TRA), the theory of belief revision (BRT), the theory of consumer culture (CCT), the communication Privacy Management Theory (CPB), and the Theory of Planned Behaviour (TPB). Notably, TPB is a popular theoretical paradigm for forecasting environmentally concerned customer behavior. Because it is a typical psychological paradigm for understanding and predicting behavior and decision-making. Attitudes, subjective norms, and perceived behavioral control impact behavioral intentions, according to TPB. TPB helps researchers evaluate customer attitudes toward green products, societal constraints, and perceived control over green purchase behaviors (Kim et al., 2013).

However, most scholars have not analyzed the mediating effect of behavioral intentions. For example, Rambalak Yadav (2017) emphasized the interdependence of motivation (intentions) and ability (behavioral control) but did not explore the mediating role of intentions in the attitude-behavior and subjective norms-behavior relationships. Thus, Khan Md. Raziuddin Taufique (2018) used the TPB theory to examine the mediating effect of green purchase intentions on the relationships between the three antecedent variables and the dependent variable in the context of Indian consumers' pro-environmental behavior.

What's more, research on green purchase behavior has mainly focused on developed countries, with limited studies carried out in developing countries (Askadilla & Krisjanti, 2017; Sharma & Sharma, 2017, 2017; Zaremohzzabieh et al., 2021). In the context of green purchase behavior research in Malaysia, only five articles specifically used the TPB theory. Additionally, the majority of data came from student samples on campuses, which may not fully reflect the general green purchase behavior in a specific region.

2.2 Green Purchase Attitude (GPA), Subjective Norms (SN), and perceived behavior control (PBC)

GPA refers to positive or negative beliefs towards a specific behavior. SN describes the perceived social pressure regarding the performance or non-performance of certain behaviors, while PBC is used to assess an individual's perceived ease or difficulty in performing a specific behavior (Ajzen, 1991). Previous research has shown a significant and positive relationship between consumers' green purchase attitude, subjective norms, perceived behavior control, and their intention to purchase environmentally friendly products (Han, 2020; Kim et al., 2013; Yadav & Pathak, 2016; Zaremohzzabieh et al., 2021). Therefore, the following hypotheses are proposed:

H1a: GPA significantly influences GPI among educated consumers in Malaysia.

H2a: SN significantly influences GPI among educated consumers in Malaysia.

H3a: PBC significantly influences GPI among educated consumers in Malaysia.

2.3 Green Purchase Intention (GPI) and Green Purchase behavior (GPB)

Consumers' actual purchase behavior towards environmentally friendly products is primarily influenced by their green purchase intentions (Taufique & Vaithianathan, 2018). Green purchase intention indicates an individual's readiness to execute a particular behavior and is considered a direct antecedent of behavior (Ajzen, n.d.). This study refers to the consumption behavior of environmentally friendly or environmentally beneficial goods as "green purchase behavior." Previous studies have repeatedly found that green purchase attitude, subjective norms, and perceived behavior control significantly influence green purchase behavior (Han, 2020; Hasan & Ali, 2015; Ogiemwonyi et al., 2022; Taib et al., 2022; Yadav & Pathak, 2016). The mediating effect of green purchase intentions on the attitude-behavior and perceived behavior control-behavior relationships has been examined, as demonstrated by Khan Md. Raziuddin Taufique (2018) in their study of Indian consumers. Therefore, the following hypotheses are proposed:

H1b: GPA significantly influences GPB among educated consumers in Malaysia.

H2b: SN significantly influences GPB among educated consumers in Malaysia.

H3b: PBC significantly influences GPB among educated consumers in Malaysia.

H3: GPI significantly influences GPB among educated consumers in Malaysia.

H4: GPI mediates GPA and GPB among educated consumers in Malaysia.

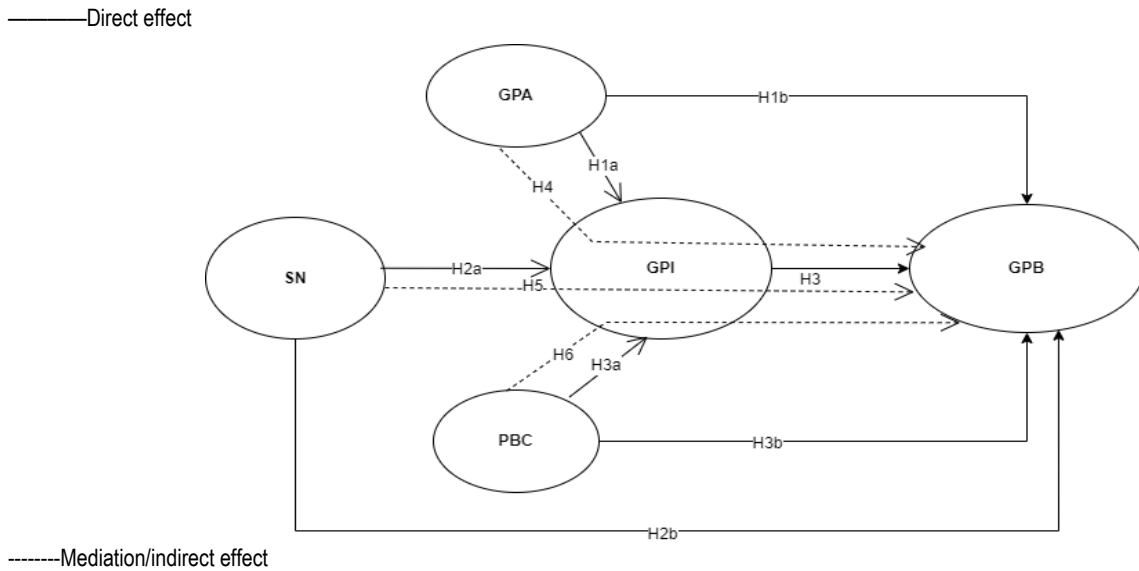
H5: GPI mediates SN and GPB among educated consumers in Malaysia.

H6: GPI mediates PBC and GPB among educated consumers in Malaysia.

3.0 Methodology

3.1 Framework

This study used the theory of planned behaviour (TPB) proposed by Ajzen (1991, 2002) to examine the relationship between green purchase attitude (GPA), perceived behaviour control (PBC), and subjective norm (SN), with GPI serving as a mediator and GPB serving as the dependent variable. Figure 1 depicts the final design architecture.



3.2 population and sampling

An online survey was used to collect the data. First, a preliminary examination with 15 individuals was conducted. The needed degree of expertise and the wording of the questions were then slightly altered in the questionnaire. The design and duration of the survey received no criticism. Furthermore, no pre-test respondent expressed any dissatisfaction with the questionnaire's design or the length of the research. Most of the respondents for the primary data collection were obtained via the snowball sampling approach, which involved sending emails to Malaysian-only classmates and teachers of the study's researchers, who subsequently sent the questionnaire to other Malaysian-only peers. The message they received featured a link and an invitation for them to take part in the study.

About 700 contacts were invited to the survey, which promised anonymity and confidentiality and notified them that the results would be published in an academic or scientific journal. These connections were anticipated to be diverse in age, career, and city to guarantee sample diversity. This indicator worked since the final replies indicated some personal variations (Table 1).

Table 1 Respondents' demographics (N=330)

Factors	Categories	Frequency	Percentage
Age	19-23	70	21.2
	24-28	67	20.3
	29-32	39	11.8
	33 and above	154	46.7
Gender	Female	155	47
	Male	175	53
Education Level	High school	20	6.1
	Associate's Degree	46	13.9
	Bachelor's Degree	167	50.6
	Masters' Degree	54	16.4
	Doctoral Degree	36	10.9
	Others	7	2.1
Monthly Allowance	1000 RM and below	30	9.1
	1001-2000RM	63	19.1

	2001-4000RM	62	18.8
	>4000RM	134	40.6
	No income	41	12.4
Ethnicity	Malay	14	4.2
	Chinese	275	83.3
	Indian	34	10.3
	Arab	5	1.5
	Other	2	0.6

3.3 Measures

Previous studies (Liu et al., 2020) made sure that the measures used in this study were valid in terms of their content by using tools that had already been tested. Each item adhered to Hinkin's (1998) requirements for clear writing and conciseness. Subsequently, the artifacts were subjected to scrutiny by a professor affiliated with the Graduate School of Business, together with an additional fifteen doctoral candidates. The purpose of this evaluation was to eliminate any potential sources of ambiguity and redundancy, while simultaneously enhancing the overall clarity of the objects.

Drawing on Akbar et al.'s (2014) five items to measure GPA and GPI. A three-item scale for measuring SN was adopted by Chan and Lau (2002). In addition, Kim and Han's (2010) 3-item scale was used for measuring PBC, and GPB was measured using 9- items from Zhang and Dong (2020). A seven-point Likert-type scale was used.

4.0 Analysis and results

4.1 Measurement model: Reliability and Validity

Initially, a variety of statistical analyses, such as assessments of normality and handling of missing data, were performed utilizing the SPSS. PLS-SEM has been recognized as a valuable approach for conducting theory testing and predictive analyses (Kumar et al., 2018). It is generally regarded as superior to CB-SEM in studies with limited sample sizes (Reinartz et al., 2002). Therefore, in this study, we employed SmartPLS 4 software (Ringle et al., 2014) for modeling and testing.

By the methodologies described by Chin (1998), Hair et al. (2011), and Marcoulides and Saunders (2006), Before the structural model analysis, this study used a priori measuring models to figure out how reliable and accurate the constructs were. According to Hair Jr. et al. (2016), three items that had loadings below 0.7 were excluded from the first measurement model. As a result, there were 22 remaining items for subsequent structural modeling analyses.

Table 2. Results of the questionnaire

Constructs	Items	Outer loading	Delete (YES/NO)	VIF	Cronbach's α	AVE	CR
GPB	GPB1	0.732	NO	1.789	0.896	0.661	0.904
	GPB2	0.609	YSE	-			
	GPB3	0.767	NO	2.086			
	GPB4	0.778	NO	2.178			
	GPB5	0.439	YES	-			
	GPB6	0.812	NO	3.352			
	GPB7	0.687	YES	-			
	GPB8	0.853	NO	4.532			
	GPB9	0.856	NO	3.017			
GPI	GPI1	0.845	NO	2.677	0.938	0.802	0.940
	GPI2	0.861	NO	2.859			
	GPI3	0.91	NO	3.959			
	GPI4	0.936	NO	7.077			
	GPI5	0.922	NO	6.634			

PBC	PBC1	0.868	NO	2.09	0.864	0.787	0.868
	PBC2	0.907	NO	2.48			
	PBC3	0.885	NO	2.209			
SN	SN1	0.945	NO	4.828	0.948	0.906	0.949
	SN2	0.966	NO	6.723			
	SN3	0.944	NO	4.345			
GPA	GPA1	0.931	NO	6.286	0.957	0.855	0.958
	GPA2	0.936	NO	6.623			
	GPA3	0.898	NO	3.768			
	GPA4	0.931	NO	5.245			
	GPA5	0.926	NO	4.578			

Table 2 shows that all variables had Cronbach's alpha values higher than 0.70 (GPB 0.896, GPI 0.938, GPA 0.957, SN 0.948, and PBC 0.886), composite reliability greater than 0.70, and convergent validity higher than 0.50 (Hair et al., 2012). The correlation t-statistics were significant (Anderson and Gerbing, 1988; Hulland, 1999). The Fornell-Larcker criteria (Fornell and Larcker, 1981) showed that all constructs' AVE square root values surpassed their correlations, showing differentiated validity (Table 3). Differential validity has been verified by all indicator loadings surpassing cross-loadings (Table 4).

In addition, the initial measurement model and the observed model were tested for covariance, and for the covariance problem, the full variance inflation factors (VIFs) were evaluated as an effective alternative that can help identify the multiple covariance problem (Ting, H., 2019). The VIF value was below the threshold value of 7.077, as Hair et al. (1995) and Mason et al. (1989) suggested that when the VIF is less than 10, there is no multicollinearity problem, indicating that covariance is not an issue. Table 2 shows the results for the VIF. Therefore, the reliability and validity of the measurement model in this study can be ensured.

Table3. Discriminant validity- Fornell-Larcker criterion

	GPA	GPB	GPI	PBC	SN
GPA	0.925				
GPB	0.359	0.795			
GPI	0.66	0.598	0.895		
PBC	0.28	0.186	0.358	0.887	
SN	0.422	0.637	0.572	0.342	0.952

Table 4: Discriminant validity-cross loadings

	GPA	GPB	GPI	PBC	SN
GPA1	0.931	0.328	0.627	0.26	0.406
GPA2	0.936	0.323	0.617	0.247	0.383
GPA3	0.898	0.362	0.591	0.231	0.387
GPA4	0.931	0.334	0.581	0.262	0.388
GPA5	0.926	0.311	0.633	0.294	0.384
GPB1	0.282	0.742	0.443	0.129	0.419
GPB3	0.265	0.788	0.436	0.113	0.484
GPB4	0.287	0.812	0.494	0.076	0.515
GPB8	0.3	0.835	0.534	0.211	0.564
GPB9	0.341	0.877	0.557	0.172	0.61
GPI1	0.523	0.599	0.844	0.293	0.493
GPI2	0.572	0.458	0.86	0.293	0.422
GPI3	0.629	0.532	0.911	0.324	0.538
GPI4	0.591	0.555	0.936	0.33	0.55

GPI5	0.638	0.525	0.922	0.358	0.549
PBC1	0.303	0.091	0.331	0.868	0.237
PBC2	0.216	0.218	0.311	0.907	0.337
PBC3	0.232	0.179	0.312	0.885	0.331
SN1	0.385	0.597	0.524	0.295	0.945
SN2	0.392	0.601	0.537	0.353	0.966
SN3	0.425	0.621	0.571	0.328	0.944

4.2 Structural Modelling and Hypothesis Testing

The structural models were evaluated in this study using three main criteria (Chin, 1998): the values of the path coefficients and the t-statistic; the coefficient of determination (R2); and the Stone-Geisser criterion (Q2).

Firstly, the significance of R2 and path coefficients was used to assess the structural models. Table 5 shows that GPB and GPI have high predictive accuracy with R2 values of 0.523 and 0.551 respectively (Hair et al., 2016). Blind sampling was utilized to cross-validate construct predictive significance using Q2 values (Stone, 1977). The Q2 values were 0.436 (GPI) and 0.338 (GPB), which have predictive relevance (Amoako et al., 2020). In addition, the SRMR (Standardised Root Mean Square Residual) value of 0.046 meets the criterion of less than 0.08 (Browne and Cudeck, 1993), indicating that the structural equation model constructed in this study using TPB fits well with the actual observations and better explains the relationship between GPB and its influences on educated people. All structural model hypotheses were tested in this study using 5000 bootstrap samples and a modified confidence interval technique ($\alpha = 0.05$). The results are in Table 5.

Table 5. Testing of hypotheses and structural results

hypothesis	effect	direct effect	indirect effect	t	Sig.	supported (Y/N)
H1b	The direct effect of GPA on GPB	-0.093		1.588	0.112	NO
H1a	The direct effect of GPA on GPI	0.481		7.195	0.000	YES
H3	The direct effect of GPI on GPB	0.446		6.364	0.000	YES
H3b	The direct effect of PBC on GPB	-0.093		2.212	0.027	YES
H3a	The direct effect of PBC on GPI	0.102		2.180	0.029	YES
H2b	The direct effect of SN on GPB	0.473		7.129	0.000	YES
H2a	The direct effect of SN on GPI	0.308		5.344	0.000	YES
H5	The indirect effect of SN on GPB through GPI		0.137	3.612	0.000	YES
H4	The indirect effect of GPA on GPB through GPI		0.214	5.315	0.000	YES
H6	The indirect effect of PBC on GPB through GPI		0.046	2.015	0.044	YES

R2(GPB) = 0.523 R2(GPI) = 0.551

Table 5 showed that GPA had no significant influence on GPB (H1b = -0.093, $p = 0.112$), disproving the direct relationship hypothesis (H1b). SN had a direct positive effect on GPB (H2b: =0.473, $p=0.000$) and GPI (H2a: =0.308, $p=0.000$); PBC was positively related to GPI (H3a: =0.102, $p=0.029$) but negatively related to GPB (H3b: =-0.093, $p=0.027$); and GPI was positively related to GPB.

The study also examined the indirect effects of GPA, SN, and PBC on GPB through GPI and found that all three hypotheses were validated.

5.0 Conclusion and Recommendations

This study employed the TPB to explore the green purchase behavior of educated consumers in Malaysia. The results of our analysis revealed that the predictor structure significantly influences consumers' willingness to purchase green products, which, in turn, affects

their actual buying behavior. However, despite these findings, we also observed some results that diverge from previous research, warranting further discussion. Here, we present three aspects that merit consideration.

Firstly, the examination of the impact of perceived behavior control on green purchase behavior showed a significant negative effect with a path coefficient of -0.093 ($p = 0.027$). This implies that perceived behavior control has a notable adverse impact on predicting green purchase behavior among educated consumers. This finding is consistent with the concept proposed by Ajzen (1991) that "behavioral achievement jointly depends on motivation (intention) and ability (behavioral control)." However, it contrasts with the positive effects reported in previous studies by researchers such as Stavros P. Kalafatis (1999), Shwu-Ing Wu (2014), and Khan Md. Raziuddin Taufique (2018). We speculate that the negative influence observed in our study may reflect consumers' concerns regarding environmental challenges and issues, leading them to feel less capable of effectively controlling or influencing the process and outcome of green purchases. It may also indicate that some educated consumers perceive certain limitations and inconveniences when buying green products, resulting in reduced actual green purchase behavior. Future research can delve deeper into the specific factors contributing to these limitations and inconveniences and explore ways to eliminate or mitigate their impact on green purchase behavior.

Secondly, the green purchase attitude of educated consumers in Malaysia did not directly influence green purchase behavior. This implies that attitude itself does not completely drive behavior (Zheng et al., 2020). This finding may be attributed to the fact that, among educated consumers, purchase attitudes may be influenced by multiple factors beyond their attitudes toward green products. Future research can attempt to further categorize consumers based on different types of focal points in their green purchase attitudes to reveal variations in green purchase behavior within the proposed model.

Lastly, although green purchase attitude does not have a direct impact on green purchase behavior, our mediation analysis revealed that when educated consumers hold more positive green purchase attitudes, they are more likely to develop stronger Green Purchase Intentions (GPI). This shows a larger desire to acquire green items, which leads to green purchase behavior. Green purchase Intentions moderate the association between green purchase attitude, subjective norm, perceived behavior control, and green purchase behavior among Malaysian educated consumers.

In conclusion, the results of this study support the applicability of TPB in the context of green consumerism in a developing country. This provides valuable practical guidance for businesses and policymakers. Understanding educated consumers when purchasing green products can help businesses better comprehend their target audience and implement targeted green marketing strategies. Government agencies can also formulate relevant policies based on the research findings to encourage and promote environmentally friendly purchase behavior among educated consumers.

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