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Predicting the Purchase Intention and Behaviour towards Green Skincare Products among Malaysian Consumers

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Received: 24 November 2020; Accepted: 15 December 2020; Published: 21 December 2020

Abstract: This study examined the effect of environmental concern, attitude, subjective norm, perceived behavioural control, and availability on the intention to purchase green skincare products and the effect of purchase intention on the purchase of green skincare products among Malaysian consumers. By performing multi-group analysis (MGA), this study assessed the difference in each association across gender and education groups. A cross-sectional design was adopted in this study to gather quantitative data from 300 respondents in Malaysia via online survey. The study outcomes revealed that environmental concern and attitude towards green skincare products displayed a significant effect on the intention among Malaysians to purchase green skincare products. Purchase intention exhibited a significantly positive effect on the purchase of green skincare products among Malaysian consumers. Further, purchase intention mediated the effect of environmental concern and attitude on the purchase of green skincare products. The MGA outputs revealed that the effect of environmental concern on purchase intention among respondents with a bachelor's degree or equivalent was significantly higher than those who held a diploma or technical school certificate. Meanwhile, the effect of subjective norms on purchase intention among respondents with a bachelor's degree or equivalent was significantly lower than those with a diploma or technical school certificate. Next, the effect of availability on purchase intention, as well as the effect of purchase intention on the purchase of green skincare products among male respondents was significantly higher than female respondents. In order to promote the mass adoption of green skincare products among Malaysians, related promotional activities should emphasize the environmental aspects of using green products, in comparison to using conventional skincare products.

Keywords: green products; skincare; theory of planned behaviour; intention and adoption; Malaysia

1. Introduction

Green consumption has been gaining momentum as it not only empowers the mitigation of climate issues, but also offers business growth opportunities to numerous companies [1]. Green consumption is increasingly becoming synonymous with the terms "organic", "healthy", and "sustainable", mainly because these green products or services minimise the deleterious effect of human actions on the environment [2,3]. This rising environmental awareness has led to the emergence of a new type of consumer behaviour—green consumption [4]. Concern for the environment promotes a healthy lifestyle as consumers possess better understanding about environmental deterioration [5].

Asian consumers have become more engaged in using natural and organic-based cosmetic products [6]. As the use of personal care products is part of daily life, consumers are more aware of the harmful effects of using cosmetic products laden with inorganic material on a daily basis [7,8]. The Malaysian cosmetic product market has been growing exponentially along with the organic cosmetic market, which recorded 10% annual growth and a projection of above US$600 million by the end of the year 2020. This increase in market size and consumer interest in green products makes the exploration of this consumer segment worthwhile.

Readily available conventional products are harmful to the climate due to the harsh inorganic chemicals found in conventionally-produced skincare products [4]. Conversely, green skincare products possess certain attributes that attract a specific segment of the community, mainly because these products are made from naturally available ingredients [6]. Unfortunately, the larger community is unaware of the benefits of using green skincare products, while some consider green products to be aggravating. The adoption of green skincare products has remained low, as consumers are less concerned about environmental wellbeing and are disinterested in personal welfare [7,9]. Although many countries promote green production and consumption and much of the literature on green product adoption tends to focus on the use of organic food [10–12], green hotel stays [13,14], and bio-fuel purchase [15,16], empirical studies on consumer purchase behaviour towards green skincare products are scarce.

Young and affluent consumers are frequently engaged in the consumption of green products and services [9]. Many young female consumers are highly motivated to purchase chemical-free cosmetic products, as they help to protect the human skin with minimum or no harmful effect on the environment [2]. Likewise, the Malaysian cosmetic industry has witnessed a tremendous growth in its green product development and better acceptance by young Malaysian consumers [17,18].

This study looked into the formation of the intent to purchase green skincare products through the lens of the theory of planned behaviour (TPB) in light of individual environmental concern and the availability of green skincare products. Essentially, this study assessed the impact of the intention to purchase green skincare products on the purchase of green skincare products.

2. Literature Review

2.1. Theoretical Foundation

The TBP deals with situations that trigger one's cognitive attributes that lead towards the development of the initial intention and behaviour at a later stage [19]. At the initial stage, three distinguishing factors, namely, attitude towards behaviour, subjective norms, and perceived behavioural control, build the intention towards the behaviour [20]. The TPB, as a cognitive-social framework, has been extensively applied to explore vast social and behavioural research domains [21–23]. Recently, the TPB has been applied in green consumption behavioural research areas and offered significant outcomes. The TPB has been exploited not only to explore consumer behaviour, but also to guide the formulation of government interventions to facilitate the mass adoption of green products [24].

The TPB has been employed to explore green consumption among low-income households [7,25]. Attitude and perceived behavioural control are the most significant predictors of green consumption [4]. The subjective norms appeared low among low-income households, thus indicating the pressing need to uplift the social acceptance of green products [24].

2.2. Determinants of Intention to Purchase Green Skincare Products

2.2.1. Environmental Concern

Environmental concern at the individual level refers to the perception that human behaviour affects the environment [26]. It is a comprehensive personal belief that collective human behaviour has consequences on the atmosphere of the Earth [1]. High-level environmental concern projects

engage in environment-friendly practices. One's concern for the environment leads to the approval of green consumption [23]. Among consumers, concern for the environment primarily inspires the adoption of green products and services [9]. For example, among Malaysian consumers, individual environmental concern predicts the purchase of green products [27]. Thus, the study conducted by Chin, Jiang, Mufidah, Persada, and Noer [9] found a positive influence of environmental concern on the intention to purchase green skincare products, while Jaiswal and Kant [28] validated that perceived environmental knowledge has a positive relationship towards purchase intention of green products. In light of the literature, the following is hypothesised:

Hypothesis 1 (H1). *Environmental concern has a significantly positive effect on the intention to purchase green skincare products among Malaysian consumers.*

2.2.2. Attitude towards Green Skincare Products

Attitude is referred to as an individual's learned predisposition to engage and respond constantly towards a favourable or unfavourable attitude [17]. This manner represents what they like and dislike concerning the intention to purchase products or services. Attitude towards this behaviour significantly predicts green consumption behaviour [3]. Likewise, one's attitude towards organic personal care products significantly envisages the intention to purchase organic personal care products among Malaysian consumers [4]. It was reported that the attitude towards green products among Malaysian consumers influenced their intention to purchase green products [29]. Hence, the hypothesis below is proposed:

Hypothesis 2 (H2). *Attitude towards green skincare products has a significantly positive effect on the intention to purchase green skincare products among Malaysian consumers.*

2.2.3. Subjective Norms

An individual who performs a behaviour that is perceived to be social pressure is doing so as a result of subjective norms. This individual has normative beliefs about the expectations of other people [18]. Norms deduce human behaviour. Social approval from families, friends, and close associates influences one's decision making [30]. An individual's cognition significantly alters with a suggestion or advice from someone important to the person [23]. Subjective norms refer to the opinions of significant others with heavy influence on one's decision making. Subjective norms significantly influence the formation of the intention to purchase green products [20]. Social encouragement is critical for the consumption of green products and services [31].

Hypothesis 3 (H3). *Subjective norms have a significantly positive effect on the intention to purchase green skincare products among Malaysian consumers.*

2.2.4. Perceived Behavioural Control

The perception of ability and empowerment among individuals can lead to the smooth execution of the target behaviour [23]. Among individuals, the perception of capacity or ability to choose the target behaviour is called "perceived behavioural control" [19]. Perceived behavioural control is a critical impute of TPB and a dominant predictor of green consumption behavioural intention [24]. A consumer with significant perception of perceived behavioural control is more likely to have a higher intention for green consumption [9]. A person with the perception of capacity and ability, together with responsibility, develops an intention to purchase green products including household consumption, energy appliance, and reusable energy [7]. Based on the above discussion, the following is proposed:

Hypothesis 4 (H4). *Perceived behavioural control has a significantly positive effect on the intention to purchase green skincare products among Malaysian consumers.*

2.2.5. Availability of Green Skincare Products

The availability of green products offers ease of buying, ready comparison among products, and ease of exchange or return of products. Availability enhances a consumer's awareness and evaluation of green products prior to an actual purchase [32]. The availability of green products improves over time. Generally, a consumer would feel more confident in using green products due to their vast availability. The availability of green skincare products can enhance one's intention to engage in the use of such products [6]. Hence, the following is hypothesised:

Hypothesis 5 (H5). *Availability of green skincare products has a significantly positive effect on the intention to purchase green skincare products among Malaysian consumers.*

2.3. Intention and Purchase of Green Skincare Products

Numerous personal and surrounding influential people shape one's intentions. The roles of attitude towards behaviour, social norms, and perceived control can considerably empower the intention to behave in a particular manner [24]. However, social norms and perception of control do not strongly facilitate novel behaviour, such as the adoption of green products and services. A consumer's concern for the environment may influence the intention to purchase green products [7,21]. Yang [33] found a strong relationship between purchase intentions and purchasing green skincare products while agreeing that consumer purchasing intention significantly affects the purchase of green skincare products to protect the environment [9]. In light of the TPB, the following is proposed:

Hypothesis 6 (H6). *Intention to purchase green skincare products has a significantly positive effect on the purchase of green skincare products among Malaysian consumers.*

2.4. Mediating the Effect of Intention to Purchase Green Skincare Products

The TPB postulates that intention mediates the relationships among three factors (attitude, subjective norms, and perceived behavioural control) of TPB on actual behavior [34,35]. By using the same theoretical domain, the TPB is extended in this study by embedding environmental concern and availability of green skincare products. This study assessed the mediating effect of intention to purchase green skincare products on the correlations between five factors and the purchase of green skincare products, as follows:

Hypothesis 7 (H7). *The intention to purchase green skincare products mediates the relationships of environmental concern, attitude, subjective norms, perceived behavioural control, and availability with the purchase of green skincare products among Malaysian consumers.*

All associations hypothesized and tested, presented in Figure 1.

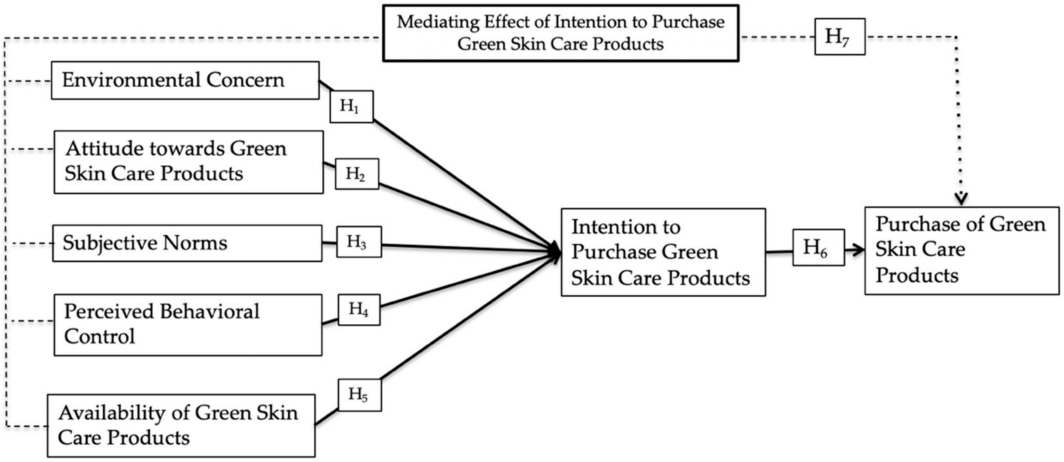

Figure 1. Research framework.

3. Research Methodology

The population of this study is composed of Malaysian consumers aged between 18 and 60 years. In order to collect quantitative data, the initial intention was to involve 384 respondents, but only 300 respondents participated in the survey. The questionnaire was disseminated via online social platforms to participants selected via a convenient sampling. The survey employed a pre-structured close-ended questionnaire, in which the respondents had to rate the scores from a set of pre-defined options. The data collection for this cross-sectional study was held from 1st May to 4th June 2020.

All the survey items (presented in Table 1) were adapted from previous empirical studies with minor modifications. The questionnaire items are presented in Table 1. Items for the factor of attitude were adopted from Al Mamun et al. [7], while items for subjective norms were adopted from Promotosh and Sajedul [31]. Next, items for the factor of perceived behavioural control were adopted from Al Mamun et al. [7] and Ghazali et al. [4], whereas items for two factors, namely environmental concern and availability of green skincare products, were derived from Kapoor, Singh, and Misra [32]. The last items that measured both intention and behaviour towards green skincare products were adapted from Al Mamun et al. [7] and Ghazali et al. [4]. The questionnaire has two parts. The first part gathered the demographic profile so as to obtain private information that was kept confidential and used only for study purposes. The second part of the questionnaire identified both the intention and consumption of green skincare products among Malaysian consumers. The respondents rated their responses with five- and seven-point Likert scales for independent and dependent variables, respectively.

Table 1. Survey items used in this study.

Code	Questions	Source
EC—Item 1	I use green skincare products because I strive to contribute to a healthy environment	Kapoor, Singh and Misra [32]
EC—Item 2	I pursue natural ingredients when purchasing green skincare products	
EC—Item 3	I have enough environmental awareness and knowledge about green skincare products	
AT—Item 1	I have positive attitude towards green skincare products	Mamun et al. [7]
AT—Item 2	I prefer using green skincare products more than conventional skincare products although they are expensive	
AT—Item 3	I prefer buying eco-friendly skincare products because they are more favourable.	

Table 1. *Cont.*

Code	Questions	Source
AT—Item 4	I think that purchasing eco-friendly skincare products is a positive behaviour	Mamun et al. [7]
AT—Item 5	I think that purchasing eco-friendly skincare products is a good idea	
SN—Item 1	I prefer purchasing green skincare products when my family members recommend them	Promotosh and Sajedul [31]
SN—Item 2	I prefer purchasing green skincare products when my friends recommend them	
SN—Item 3	I learned how to distinguish green skincare products from conventional skincare products from my parents	
SN—Item 4	I learned how to distinguish green skincare products from conventional skincare products from my friends	
SN—Item 5	Social media can influence my decision to buy green skincare products	
PC—Item 1	I can afford to buy green skincare products	Mamun et al. [7] and Ghazali et al. [4]
PC—Item 2	Going green would be entirely within my control	
PC—Item 3	I am willing to buy green skincare products	
PC—Item 4	I can find the suppliers of green skincare products near my location	
PC—Item 5	I have time to search for environment-friendly skincare products	
AV—Item 1	I can easily buy green skincare products	Kapoor, Singh and Misra [32]
AV—Item 2	I use green skincare products because they readily offer more options	
AV—Item 3	I prefer buying green skincare products online than visiting the stores	
AV—Item 4	I prefer buying green skincare products online because it is easily accessible	
AV—Item 5	I prefer buying green skincare products online because it offers different payment methods	
INT—Item 1	I intend to purchase green skincare products in future	Mamun et al. [7] and Ghazali et al. [4]
INT—Item 2	I probably switch to using green skincare products in future	
INT—Item 3	I prefer purchasing green skincare products than conventional skincare products	
INT—Item 4	I plan to purchase green skincare products because of their positive environmental contribution	
INT—Item 5	I would like to practice environment-friendly consumption	
BEH—Item 1	I often purchase green skincare products	Mamun et al. [7]
BEH—Item 2	I have already switched to green skincare products	
BEH—Item 3	I often purchase green skincare products than conventional skincare products	
BEH—Item 4	I purchase green skincare products because of their positive environmental contribution	
BEH—Item 5	I often practice environment-friendly consumption	
BEH—Item 6	Out of all the skincare products that you are currently using, how many are green skincare products (in percentage)?	

Note: EC: Environmental concern, AT: Attitude towards green skincare products, SN: Subjective norm, PC: Perceived behavioural control; AV: Availability of green skincare products, INT: Intention to purchase green skincare products, BEH: Purchase of green skincare products.

3.1. Common Method Bias (CMB)

In order to identify CMB, one-factor test was employed to extract a fixed factor from all the variables that display the single one component, which explained 41.47% of the variance.

3.2. Multivariate Normality

This study used Web Power (https://webpower.psychstat.org/wiki/tools/index) to test multivariate normality. As a result, the *p*-Value was below 0.05, which verified the presence of multivariate non-normality.

3.3. Data Analysis

Partial least squares structural equation modelling (PLS-SEM) was executed using Smart-PLS software 3.1. The PLS-SEM is a multivariate analysis tool that estimates path models that have latent constructs with composites [36]. The PLS-SEM enables scholars to use non-normal and small datasets. Further, PLS-SEM is associated with the casual-predictive flora that supports working with composites-based complex models and has no notion of goodness-of-fit assessment, such as the covariance-based SEM [37]. The PLS-SEM data analysis accomplishes an investigation in two steps. The first step reflects the estimation of model measurement, where reliability and validity of the study constructs are determined [36]; whereas discriminant validity is achieved by using the old and newly proposed approaches of Fornell–Larcker criterion and the heterotrait-monotrait ratio (HTMT) [38,39]. The second step estimates the structural model relations and examines the study hypotheses with significance levels [37]. Model estimation performed using r^2, Q^2, and effect size (f^2) describes the path effect from exogenous construct to endogenous construct [36].

The multi-group analysis (MGA) in PLS-SEM allows scholars to discriminate variances in pre-defined groups under analysis [40]. The MGA is a convenient technique to check the variances among the groups categorised in the data [36]. The MGA evaluates variations amongst the structural paths of the various groups that exist in the data [40]. Initially, one must establish the groups grounded on the categorical variables of interest, such as age, gender, and income. Next, the path coefficients of each group are examined, and whether the variances among the groups are significant is determined based on steps prescribed by Henseler et al. [40]. Variances that exist within the data based on the characteristics of groups may not be evident in the aggregated data. Path coefficients of the group data that signify the statistical variance via MGA display statistically significant differences between the data based on categorical bases [40].

The PLSpredict was endorsed by Shumeli et al. [41] to confirm the model's key predict capability along with the study construct and model prediction errors. Predictive performance measured with Q^2 predict statistics, as a tool of naïve yardstick, was developed as the PLSpredict method [41]. The PLSpredict appraises the naïve benchmark in the linear regression model (LM). Then, a comparison between Root Mean Square Error (RMSE) and Mean Absolute Error (MAE) values for LM and PLS model confirms the explanatory power of the two methods. Shumeli et al. [41] claimed that the PLS-SEM model lacks predictive power if the PLS-SEM model yields higher prediction errors than the LM benchmark. If most of the PLS-SEM analysis generates higher prediction errors than the LM benchmark, it denotes low predictive power of the PLS-SEM model. If only a small portion of the PLS-SEM analysis produces higher prediction errors than the LM benchmark, it indicates medium power of the PLS-SEM model. If no indicator in the PLS-SEM model has more errors than the LM benchmark, the PLS-SEM model reflects higher predictive power [41].

The importance–performance map analysis (IPMA) defines the study constructs into relatively high to low by importance and performance for the endogenous construct [37]. The IPMA distinguishes the possible area of enrichment that require examination from legislators and from researchers. The IPMA analysis generates the total effect of the rescaled construct scores as an unstandardized technique [42]. Rescaling steadily estimates the latent variable score for a construct within a 0–100 score. The mean

score of the latent construct indicates the performance of the latent construct, in which 0 represents the least and 100 represents the most substantial role of the exogenous construct in the performance of the endogenous construct [36].

4. Findings

4.1. Demographic Characteristics

In this study, data were collected from young and educated Malaysians. As presented in Table 2, most of the respondents were females (67%) and a majority of the study respondents were between 18 and 27 years old (82.3%). Meanwhile, 11.3% of the respondents were 28–37 years old, 4.0% belonged to the 38–47 age group, 1.0% were 48–57 years old, and the remaining respondents were above 57 years old. A vast majority of the respondents were single (86%), and the rest were married. In total, 65.0% of the respondents possessed a bachelor's degree or equivalent, while 9.0% had secondary school level education, and 19.3% had acquired a diploma or technical school level education. Among the respondents, only 6.3% had a Master's level education, and the remaining respondents had Doctoral level qualifications. About 93% of the respondents dwelled in urban areas.

Table 2. Demographic characteristics.

	N	%		N	%
Gender			Marital Status		
Male	99	33.0	Single	258	86.0
Female	201	67.0	Married	40	13.3
Total	300	100.0	Divorced	2	0.7
			Total	300	100.0
Age Group					
18 to 27 years	247	82.3	Education		
28 to 37 years	34	11.3	Secondary school certificate	27	9.0
38 to 47 years	12	4.0	Diploma/technical school certificate	58	19.3
48 to 57 years	3	1.0	Bachelor's degree or equivalent	195	65.0
>57 years	4	1.3	Master's degree	19	6.3
Total	300	100.0	Doctoral degree	1	0.3
			Total	300	100.0
Living Areas					
Urban	279	93.0			
Rural	21	7.0			
Total	300	100.0			

4.2. Measurement Model Assessment

Hair et al. [36] prescribed the incorporation of Smart PLS and report of the outcomes. The reliability of the study constructs was determined based on Cronbach's Alpha (α), composite reliability (CR), and DG rho-A. The results demonstrated that all reliability scores fell in the acceptable range. The minimum values for (α), (CR), and DG rho-A were 0.909, 0.845, and 0.822, respectively. The values of (α), (CR), and rho-A for each construct exceeded the threshold of 0.70 [36], as tabulated in Table 3. These results specify that the model constructs are indeed reliable. The average variance extract (AVE) for all the constructs should exceed the threshold of a 0.50 score to establish convergent validity as an indication of uni-dimensionality of each construct [36]. The variance inflation factor (VIF) for each construct (see Table 3) had been less than 3.3; signifying a lack of multi-collinearity issues for the model constructs. The constructs also displayed acceptable convergent validity (see Table 4). Both item loading and cross-loading indicated acceptable discriminant validity for the constructs (see Table 5). The Fornell–Larcker criterion [38] for each construct must exceed its own construct than other latent constructs to establish discriminant validity [36].

Table 3. Reliability and validity.

Variables	No. Items	Mean	SD	CA	DG *rho*	CR	AVE	VIF
EC	3	3.791	0.792	0.742	0.775	0.854	0.663	2.541
AT	5	4.008	0.674	0.833	0.846	0.882	0.601	2.495
SN	5	3.680	0.779	0.812	0.833	0.868	0.570	2.060
PC	5	3.544	0.715	0.763	0.793	0.837	0.510	2.151
AV	5	3.433	0.830	0.817	0.818	0.871	0.576	1.776
INT	5	5.33	1.080	0.925	0.927	0.943	0.769	1.000
PUR	6	4.124	1.228	0.901	0.912	0.923	0.668	–

Note: EC: Environmental concern; AT: Attitude towards green skincare products; SN: Subjective norms; PC: Perceived behavioral control; AV: Availability of green skincare products; INT: Intention to purchase green skincare products; PUR: Purchase of green skincare products; SD: Standard deviation; CA: Cronbach's Alpha; DG *rho*—Dillon–Goldstein's *rho*; CR: Composite reliability; AVE: Average variance extracted; VIF: Variance inflation factors. **Source:** Author's data analysis.

Table 4. Discriminant validity.

	EC	AT	SN	PC	AV	INT	PUR
Fornell–Larcker Criterion							
EC	0.814						
AT	0.681	0.775					
SN	0.625	0.645	0.755				
PC	0.640	0.665	0.559	0.714			
AV	0.609	0.470	0.543	0.536	0.759		
INT	0.795	0.733	0.601	0.627	0.543	0.877	
PUR	0.683	0.559	0.546	0.644	0.532	0.690	0.817
Heterotrait-Monotrait Ratio (HTMT)							
EC	–						
AT	0.859	–					
SN	0.786	0.757	–				
PC	0.848	0.810	0.697	–			
AV	0.761	0.549	0.667	0.667	–		
INT	0.951	0.828	0.676	0.707	0.608	–	
PUR	0.831	0.633	0.619	0.767	0.589	0.729	–

Note: EC: Environmental concern; AT: Attitude towards green skincare products; SN: Subjective norms; PC: Perceived behavioral control; AV: Availability of green skincare products; INT: Intention to purchase green skincare products; PUR: Purchase of green skincare products. **Source:** Author's data analysis.

4.3. Path Analysis

The model measurement was accomplished after determining model validity and reliability. The effect of environmental concern, attitude towards green skincare products, subjective norms, perceived behavioural control, and availability of green skincare products on the intention to purchase green skincare products was determined. The adjusted r^2 value for the five exogenous constructs (environmental concern, attitude towards green skincare products, subjective norms, perceived behavioural control, and availability of green skincare products) explained 70.5% of the change in intention to purchase green skincare products, similar to the coefficient of determination. Chin [37] confirmed that models with Q^2 more than zero have a predictive relevance that are 0.02 (small predictive relevance), 0.15 (medium predictive relevance), and 0.35 (high predictive relevance).

Therefore, the predictive relevance (Q^2) value for the intention to purchase green skincare products was 0.532; indicating high predictive relevance [37].

Table 5. Loadings and cross-loading.

Code	EC	AT	SN	PC	AV	INT	PUR
EC—Item 1	0.883	0.591	0.583	0.518	0.519	0.723	0.528
EC—Item 2	0.868	0.588	0.524	0.477	0.532	0.691	0.550
EC—Item 3	0.677	0.479	0.402	0.607	0.433	0.507	0.627
AT—Item 1	0.443	0.740	0.356	0.527	0.238	0.511	0.421
AT—Item 2	0.456	0.697	0.467	0.548	0.364	0.475	0.510
AT—Item 3	0.642	0.854	0.611	0.536	0.411	0.666	0.517
AT—Item 4	0.522	0.770	0.499	0.475	0.408	0.541	0.346
AT—Item 5	0.548	0.804	0.539	0.510	0.389	0.621	0.384
SN—Item 1	0.569	0.625	0.823	0.509	0.438	0.560	0.484
SN—Item 2	0.524	0.527	0.827	0.420	0.341	0.510	0.439
SN—Item 3	0.402	0.356	0.686	0.327	0.488	0.331	0.359
SN—Item 4	0.433	0.415	0.750	0.430	0.471	0.400	0.436
SN—Item 5	0.393	0.454	0.676	0.401	0.357	0.416	0.322
PC—Item 1	0.374	0.396	0.383	0.690	0.326	0.322	0.407
PC—Item 2	0.424	0.455	0.346	0.765	0.345	0.437	0.467
PC—Item 3	0.577	0.638	0.486	0.759	0.396	0.607	0.508
PC—Item 4	0.367	0.360	0.382	0.585	0.487	0.307	0.403
PC—Item 5	0.476	0.441	0.385	0.754	0.397	0.457	0.494
AV—Item 1	0.493	0.398	0.393	0.525	0.719	0.437	0.448
AV—Item 2	0.560	0.449	0.511	0.491	0.736	0.476	0.563
AV—Item 3	0.352	0.261	0.359	0.298	0.781	0.311	0.336
AV—Item 4	0.443	0.309	0.375	0.321	0.785	0.392	0.301
AV—Item 5	0.405	0.314	0.381	0.337	0.770	0.397	0.310
INT—Item 1	0.724	0.652	0.505	0.544	0.476	0.883	0.593
INT—Item 2	0.696	0.637	0.499	0.563	0.450	0.900	0.630
INT—Item 3	0.714	0.663	0.568	0.581	0.509	0.898	0.648
INT—Item 4	0.706	0.655	0.566	0.557	0.530	0.874	0.618
INT—Item 5	0.641	0.603	0.492	0.497	0.408	0.826	0.530
PUR—Item 1	0.536	0.457	0.437	0.584	0.463	0.538	0.853
PUR—Item 2	0.481	0.394	0.407	0.557	0.414	0.471	0.862
PUR—Item 3	0.535	0.398	0.400	0.532	0.426	0.488	0.873
PUR—Item 4	0.685	0.536	0.569	0.477	0.521	0.698	0.762
PUR—Item 5	0.614	0.509	0.410	0.535	0.375	0.646	0.819
PUR—Item 6	0.391	0.375	0.394	0.467	0.367	0.431	0.724

Note: EC: Environmental concern; AT: Attitude towards green skincare products; SN: Subjective norms; PC: Perceived behavioral control; AV: Availability of green skincare products; INT: Intention to purchase green skincare products; PUR: Purchase of green skincare products. **Source:** Author's data analysis.

Table 6 presents standardised path values, t-values, and significance levels. The path coefficient between environmental concern (EC) and intention to purchase green skincare products (INT) (β = 0.498, t = 8.088, p = 0.000) indicated a significantly positive effect of EC on INT. This result forms statistical evidence to accept H1. The path coefficient between attitude towards green skincare products (AT) and INT (β = 0.315, t = 5.790, p = 0.000) signified a significantly positive effect of AT on INT, thus accepting H2. The path value for subjective norms (SN) and INT (β = 0.030, t = 0.649, p = 0.258) displayed insignificantly positive impact of SN on INT, thus providing no statistical sustenance for H3. The path value for perceived behavioral control (PC) and INT (β = 0.058, t = 1.370, p = 0.086) showed insignificantly positive influence of PC on INT, which rejected H4. The insignificantly positive effect of availability of green skincare products (AV) on INT (β = 0.044, t = 0.963, p = 0.168) offered no support for H5. The path coefficient between intention to purchase green skincare products (INT) and purchase green skincare products (PUR) (β = 0.690, t = 20.767, p = 0.000) that indicated significantly positive correlation led to acceptance of H6. Table 6 presents the path coefficients.

Table 6. Path coefficients.

Hypo		Beta	CI–Min	CI–Max	t	p	r^2	f^2	Q^2	Decision
Factors Affecting the Intention to Purchase Green Skincare Products										
H_1	EC→INT	0.498	0.386	0.586	8.088	0.000		0.331		Accept
H_2	AT→INT	0.315	0.232	0.408	5.790	0.000		0.135		Accept
H_3	SN→INT	0.030	–0.043	0.111	0.649	0.258	0.705	0.002	0.532	Reject
H_4	PC→INT	0.058	–0.006	0.131	1.370	0.086		0.005		Reject
H_5	AV→INT	0.044	–0.036	0.113	0.963	0.168		0.004		Reject
Factor Affecting Purchase of Green Skincare Products										
H_6	INT→PUR	0.690	0.632	0.744	20.767	0.000	0.477	0.911	0.294	Accept

Note: EC: Environmental concern; AT: Attitude towards green skincare products; SN: Subjective norms; PC: Perceived behavioral control; AV: Availability of green skincare products; INT: Intention to purchase green skincare products; PUR: Purchase of green skincare products.

4.4. Mediating Effect

The mediational effect of INT on the correlation between EC and PUR (β = 0.344, CI min = 0.260, CI max = 0.417, p = 0.000) supports hypothesis H_{1M}. Similarly, INT was found to mediate the relationship between AT and PUR (β = 0.217, CI min = 0.160, CI max = 0.277, p = 0.000), hence delivering statistical support for hypothesis H_{2M}. However, INT did not mediate the relationship between SN and PUR (β = 0.021, CI min = −0.031, CI max = 0.076, p = 0.260), thus rejecting hypothesis H_{3M}. In a similar vein, INT failed to mediate the relationship between PC and PUR (β = 0.040, CI min = −0.004, CI max = 0.091, p = 0.088), hence failing to support hypothesis H_{4M}. Lastly, hypothesis H_{5M} is not supported as the relationship between AV and PUR was not mediated by INT (β = 0.030, CI min = -0.023, CI max = 0.079, p = 0.168). The mediation results are presented in Table 7.

Table 7. Mediating effect of the intention to purchase green skincare products.

Associations	Beta	CI–Min	CI–Max	*t*	*p*	Decision
EC→INT→PUR	0.344	0.260	0.417	6.966	0.000	Accept
AT→INT→PUR	0.217	0.160	0.277	5.966	0.000	Accept
SN→INT→PUR	0.021	−0.031	0.076	0.645	0.260	Reject
PC→INT→PUR	0.040	−0.004	0.091	1.357	0.088	Reject
AV→INT→PUR	0.030	−0.023	0.079	0.964	0.168	Reject

Note: EC: Environmental concern; AT: Attitude towards green skincare products; SN: Subjective norms; PC: Perceived behavioral control; AV: Availability of Green skincare products; INT: Intention to purchase green skincare products; PUR: Purchase of green skincare products. **Source:** Author's data analysis.

4.5. Multi-Group Analysis

Multiple group analyses were performed to evaluate the differences in the results of different groups based on the sample education and gender. A non-parametric test was carried out to assess the changes in the vital relationship between the model based on faculty and gender features of the study subjects. Tables 5 and 6 display the path values for the two groups, as well as the differences within the groups with *p*-values, as recommended by Henseler et al. [40]. The P_{MGA} represents the *p*-values achieved using the multiple group analysis of PLS-SEM as the extent of the importance of the difference between the groups assessed (as presented in Table 8) [40].

Table 8. Group analysis results for gender and education.

	Male		Female		Difference		
	Beta	***p*-Value**	**Beta**	***p*-Value**	**Beta**	***p*-Value**	**Decision**
EC→INT	0.608	0.000	0.435	0.000	0.173	0.065	Not Significant
AT→INT	0.236	0.002	0.348	0.000	−0.112	0.146	Not Significant
SN→INT	−0.049	0.271	0.044	0.222	−0.094	0.169	Not Significant
PC→INT	0.020	0.377	0.087	0.073	−0.066	0.225	Not Significant
AV→INT	0.172	0.015	0.003	0.478	0.169	0.042	Sig. Difference
INT→PUR	0.780	0.000	0.647	0.000	0.133	0.015	Sig. Difference
	Diploma/Technical School Certificate		**Bachelor's Degree or Equivalent**		**Difference**		
	Beta	***p*-Value**	**Beta**	***p*-Value**	**Beta**	***p*-Value**	**Decision**
EC→INT	0.404	0.000	0.522	0.000	−0.119	0.157	Not Significant
AT→INT	0.149	0.051	0.330	0.000	−0.181	0.050	Sig. Difference
SN→INT	0.216	0.027	−0.011	0.418	0.227	0.030	Sig. Difference
PC→INT	0.167	0.010	0.072	0.098	0.096	0.141	Not Significant
AV→INT	0.128	0.110	0.013	0.416	0.115	0.167	Not Significant
INT→PUR	0.756	0.000	0.678	0.000	0.078	0.138	Not Significant

Note: EC: Environmental concern; AT: Attitude towards green skincare products; SN: Subjective norms; PC: Perceived behavioral control; AV: Availability of green skincare products; INT: Intention to purchase green skincare products; PUR: Purchase of green skincare products. **Source:** Author's data analysis.

4.5.1. Gender-Based Groups

The results of the two groups based on the gender of the sample established a significant difference in the relationship between the availability of green skincare products and the intention to purchase them. However, the difference in gender did not affect the relationships of environmental concern, attitude, subjective norms, and perceived behavioural control with the intention to purchase green

skincare products. Nonetheless, a significant difference was noted for the gender attribute in the relationship between the intention to purchase green skincare products and their purchase.

4.5.2. Groups Based on Education

The results of the two groups based on the education of the sample signified a significant difference in the relationships of attitude towards green skincare products with the intention to purchase them and subjective norms. However, no significant difference was noted for the respondents' education level in the relationships of environmental concern, perceived behavioural control, and availability of green skincare products with the intention to purchase green skincare products. Further, no significant difference existed in the relationship between the intention to purchase green skincare products and their purchase.

4.6. Importance Performance Matrix

The IPMA (see Table 9) revealed that attitude towards green skincare products emerged as the most vital influential factor for the performance of the purchase of green skincare products with a score of (0.217; 76.011). The second most pivotal factor for the performance of the purchase of green skincare products with a score of (0.690; 72.178) was the intention to purchase green skincare products. The third most important factor in the performance of the purchase of green skincare products reflected environmental concern, with a score of (0.344, 71.373). The fourth most significant factor for the performance of purchase of green skincare products signified subjective norms, with a score of (0.021; 68.660).

Table 9. Performance and total effects.

Target Construct Variables	Intention Total Effect	Purchase of Green Skincare Products Total Effect	Purchase of Green Skincare Products Performance
Environmental Concern	0.498	0.344	71.373
Attitude towards Green Skincare Products	0.315	0.217	76.011
Subjective Norm	0.030	0.021	68.660
Perceived Behavioral Control	0.058	0.040	65.485
Availability of Green Skincare Products	0.044	0.030	60.854
Intention to Purchase Green Skincare Products	–	0.690	72.178

Source: Author's data analysis.

4.7. Predictive Assessment

Predictive assessment of the study model revealed that the model predictive power, which refers to the intention to purchase green skincare products, had high predictive power as most of the Q^2 predict values were above 0. The Q^2 predict values above 0 propose that the naïve PLS-SEM model can perform better than the LM benchmark. The results offer critical evidence that the PLS-SEM model could perform well to predict the intention to purchase green skincare products. The other part of the model in predicting the purchase of green skincare products exhibited low predictive power. The Q^2 predict values were all above zero, confirming the predictive power of the model. However, the LM benchmark yielded fewer errors than the PLS-SEM model. This signified that the PLS-SEM model had low predictive power. The results are depicted in Table 10.

Table 10. Predictive model assessment.

	Q^2 predict	RMSE (PLS-SEM)	RMSE (LM)	Difference	Predictive Power
INT—Item 1	0.556	0.811	0.849	0.038	
INT—Item 2	0.523	0.862	0.905	−0.043	High Predictive Power
INT—Item 3	0.566	0.863	0.885	−0.023	
INT—Item 4	0.552	0.811	0.836	−0.026	
INT—Item 5	0.449	0.882	0.880	0.002	
PUR—Item 1	0.317	1.333	1.231	0.102	
PUR—Item 2	0.257	1.446	1.318	0.127	
PUR—Item 3	0.290	1.394	1.294	0.100	
PUR—Item 4	0.407	1.075	1.046	0.029	Low Predictive Power
PUR—Item 5	0.364	1.129	1.155	−0.026	
PUR—Item 6	0.189	1.065	1.027	0.038	

Note: PE: Performance expectancy; EE: Effort expectancy; SE: Social influence; FC: Facilitating condition; TR: Trust; INT: Intention to adopt cashless payment; ADP: Adoption of cashless payment. **Source:** Author's data analysis.

5. Discussion

This study had identified the possible role of individual concern for the environment and availability of green skincare products on the intention to purchase green skincare products through three constructs derived from the TPB. In line with the literature, this study outcome revealed that environmental concern can significantly affect green consumption. However, the availability of green products exhibited an insignificant influence on the formation of the intent to purchase green skincare products, which is in agreement with that reported by Kapoor et al. [32].

Surprisingly, attitude towards green skincare products significantly influenced the intention to purchase green skincare products. However, social influence displayed an insignificant impact on the intention to purchase green skincare products, which is in line with the results postulated by Al Mamun et al. [7] and Ghazali et al. [4]. Perceived behavioural control also insignificantly affected the intention to purchase green skincare products among the study sample, which matched with the results provided by Chin et al. [9].

This study confirms that the intention to purchase green skincare products can significantly influence the purchase of green skincare products. This notion is in line with that reported by Mamun et al. [7]. It is evident that the intention to purchase green products strengthens green product purchase behaviour.

5.1. Mediation Analysis

The result of the mediational analysis for the intention to purchase green skincare products on the correlation between environmental concern and purchase of those products was significant. This evidenced the fact that the intention to purchase green skincare products facilitated the relationship between individual concern for the environment and purchase behaviour for green skincare products. This finding deepens one's understanding pertaining to green product purchases. Furthermore, the relationship between the attitude towards and purchase of green products mediated by the intention to purchase green products in terms of food, furniture, packaging, etc. is also reported by Al Mamun et al. [7].

5.2. Effect on Faculty and Gender on the Intention to Purchase Green Skincare Products

The study assessed the moderating effect of gender and sample education on the relationships of EC, AT, SN, PB, AV, and INT with PUR. The outcomes illustrated significant differences between male and female for the availability of green skincare products and intention to purchase them, as well as for intention to purchase green skincare products and their purchase. Next, the education of the

sample displayed a significant impact on the relationship between the attitude towards green skincare products and the intention to purchase them, as well as for social norms and the intention to purchase green skincare products. However, the effect of education on the other path model of the study appeared insignificant.

5.3. IPMA Analysis

In the performance of the purchase of green skincare products, attitude towards environment emerged as the most critical factor, followed by the intention to purchase green skincare products and environmental concern.

5.4. Predictive Assessment

The PLS-SEM model exemplified better predictive power of the PLS-SEM analysis than the LM naïve valuation for the intention to purchase green skincare products among the study sample. The first part of the model displayed high-level sample predictive accuracy for the sample predictive capacity [41]. Most of the PLS-SEM path models exhibited less RSME than the naïve LM assessment. However, for the later part of the study model, the predictive power was low, mainly because the naïve LM assessment had a lower RSME score than the PLS-SEM path models [41].

6. Conclusions

The realisation of a sustainable lifestyle is increasing. Consumers are becoming more conscious towards the consumption of green products and services. This present study integrated consumers' concern for the environment and the availability of green skincare products with the three-tier factors of TPB to predict consumers' intentions and their purchase behaviour towards green skincare products.

The study results offer the prized understanding that attitude towards green skincare products emerged as the most significant factor in predicting the purchase behaviour of green skincare products, followed by the intention to purchase green skincare products. Individual concern for the environment appeared to be the third critical essential factor that predicted the purchase of green skincare products. For policymakers, the study results contribute towards the thrust to implement the national climate change agenda under Section 9 and principle Section 4 led by the Ministry of Natural Resources and Environment, Malaysia. It is imminent that the government provide the necessary incentive to change consumer behaviour through the facilitation and promotion of green consumption. The government may incorporate the manufacturing sector to assist in developing green skincare products, which can aid the development of the green cosmetic industry segment and promote the competitiveness of the Malaysian economy. The general concern for the environment amongst consumers needs to be improved as well. Consumers' awareness and concern for the environment have encouraged their green behaviour [10].

This study proposes the following insights. It is imminent that green consumption will be part of larger communities [6]. Green consumption not only helps to restore the environment, but also boosts economies. Firms need to develop and promote innovative green products, apart from managing the mass promotion of newly developed green products [4]. This not only enhances consumer awareness towards the climate, but also promotes one's attitude towards green products. Business firms need to initiate social campaigns to enhance awareness amongst consumers about the availability of green products and to help harness environmental concern.

This present study has its strengths in extending the TPB model for green consumption. This study highlights that the educated and affluent segment of communities is attracted to green consumption. However, the wealthy and educated comprise only 20% of the total population [7]. Hence, it would be interesting to evaluate the responses gathered from middle- and lower-income segments towards green consumption, as these two groups make up the larger percentage of the population. Change in consumer behaviour is complex, wherein cognitive, awareness, and price-related factors have significantly affected consumers' choice-making [21]. This study examined the intention to purchase green products based

on individual concern for the environment and availability of green skincare products, along with the three-tier factors of TPB. It would be interesting to explore the effect of government incentives related to price reduction and the availability of right information on the formation of consumer behaviour towards green consumption.

Last but not least, another associated issue refers to the intention–behavioural gap. Although many consumers display a willingness to adopt green products and services, only a handful actually adopt green products and services. Hence, the theory of development may be incorporated to propose adoption behaviour towards green consumption. Future work may also probe into the effect of attitude and availability of green products and services on their purchase in other contexts including enhancing coverage from several countries. Hence, future studies should consider expanding the other independent variables that contribute to the purchase of green products.

Author Contributions: A.A.M., N.C.N., N.H., and N.R.B.Z. focused on conceptualization, methodology, and validation. A.A.M. conducted formal analysis and writing—review and editing. N.H., N.C.N. and N.R.B.Z. prepared the original draft preparation. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Acknowledgments: Authors want to thank Pua May Yu and Chang Boon Nee for their contribution during data collection.

Conflicts of Interest: The authors declare no conflict of interest.

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