PREDICTING ECO-LABELED PRODUCT BUYING BEHAVIOR IN AN EMERGING ECONOMY THROUGH AN EXTENSION OF THEORY OF PLANNED BEHAVIOR

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ABSTRACT

Purpose: This research attempts to explore the determinants of eco-labeled product buying behavior by extending the theory of planned behavior (TPB).

Theoretical framework: To build a comprehensive predicting model, environmental knowledge, perceived value, environmental concern, product knowledge, self-efficacy, consumer guilt, and eco-labeling are added to the traditional TPB.

Method: The proposed conceptual model was tested by conducting a questionnaire survey on consumers in an emerging economy. The partial least square-based structural equation modeling was used to analyze the data.

Results and conclusion: The results showed that product knowledge moderates the relationship between subjective norms and eco-labeled product buying intention. The results also reveal that attitude, perceived behavioral control, and subjective norm mediate the association between environmental concern and eco-labeled product buying intention. In addition to TPB constructs, consumer guilt, eco-labeling, perceived value, self-efficacy, and environmental knowledge significantly affect buying intention.

Originality/value: The current research addresses the research gap by empirically examining the in-depth effects, and the underlying mechanism of eco-label informed green purchase and its acceptance in Malaysian perspectives.

Keywords: Eco-Labeled Products, Buying Behavior, Theory of Planned Behavior, Mediating-Moderating Model.

PREVISÃO DO COMPORTAMENTO DE COMPRA DE PRODUTOS COM RÓTULO ECOLÓGICO EM UMA ECONOMIA EMERGENTE ATRAVÉS DE UMA EXTENSÃO DA TEORIA DO COMPORTAMENTO PLANEJADO

RESUMO

Objetivo: Esta investigação procura explorar os fatores determinantes do comportamento de compra de produtos com rótulo ecológico, alargando a teoria do comportamento planejado (TPB).

Estrutura teórica: Para construir um modelo de previsão abrangente, conhecimento ambiental, valor percebido, preocupação ambiental, conhecimento do produto, autoeficácia, culpa do consumidor e rotulagem ecológica são adicionados ao TPB tradicional.

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Método: O modelo conceitual proposto foi testado através da realização de um questionário sobre consumidores em uma economia emergente. A modelagem de equação estrutural parcial menos quadrada foi usada para analisar os dados.

Resultados e conclusão: Os resultados mostraram que o conhecimento do produto modera a relação entre normas subjetivas e intenção de compra de produtos com rótulo ecológico. Os resultados também revelam que a atitude, a percepção do controle comportamental e a norma subjetiva mediam a associação entre preocupação ambiental e intenção de compra de produtos com rótulo ecológico. Além dos conceitos do TPB, a culpa do consumidor, a rotulagem ecológica, o valor percebido, a autoeficácia e o conhecimento ambiental afetam significativamente a intenção de compra.

Originalidade/valor: A pesquisa atual aborda a lacuna de pesquisa examinando empiricamente os efeitos em profundidade, e o mecanismo subjacente do rótulo ecológico informado compra verde e sua aceitação nas perspectivas malaias.


PREDECIR EL COMPORTAMIENTO DE COMPRA DE PRODUCTOS CON ETIQUETA ECOLÓGICA EN UNA ECONOMÍA EMERGENTE A TRAVÉS DE UNA EXTENSIÓN DE LA TEORÍA DEL COMPORTAMIENTO PLANIFICADO

RESUMEN

Propósito: Esta investigación intenta explorar los determinantes del comportamiento de compra de productos con etiqueta ecológica extendiendo la teoría del comportamiento planificado (TPB).

Marco teórico: Para construir un modelo de predicción integral, el conocimiento ambiental, el valor percibido, la preocupación ambiental, el conocimiento del producto, la autoeficacia, la culpa del consumidor y el etiquetado ecológico se agregan al TPB tradicional.

Método: El modelo conceptual propuesto fue probado mediante la realización de una encuesta de cuestionario sobre los consumidores en una economía emergente. Para analizar los datos se utilizó el modelado parcial de ecuaciones estructurales de base menos cuadrada.

Resultados y conclusión: Los resultados mostraron que el conocimiento del producto modera la relación entre las normas subjetivas y la intención de compra de productos con etiqueta ecológica. Los resultados también revelan que la actitud, el control del comportamiento percibido y la norma subjetiva median la asociación entre la preocupación ambiental y la intención de compra de productos con etiqueta ecológica. Además de las construcciones de TPB, la culpa del consumidor, el etiquetado ecológico, el valor percibido, la autoeficacia y el conocimiento ambiental afectan significativamente la intención de compra.

Originalidad/valor: La investigación actual aborda la brecha de investigación examinando empíricamente los efectos en profundidad y el mecanismo subyacente de la compra ecológica informada por etiqueta ecológica y su aceptación en las perspectivas malaias.

Palabras clave: Productos Eco-Etiquetados, Comportamiento de Compra, Teoría del Comportamiento Planificado, Modelo Mediador-Moderador.

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1 INTRODUCTION

Eco-labeling initiatives have gained growing publicity and have become an efficient and high-profile eco-friendly tool. This is an organized effort that uses some distinctive logos to inform buyers about the implications of both purchasing a product and the environment (Tang et al., 2004). This initiative is a response to indicate the goodness of production and helps to shift consumer behavior. The labeled goods are eco-friendly compared to the other commodities from competitors that remind consumers of the ecological effects of their use and enable producers towards sustainable farming. Scholars recommend this eco-labeling program as part of the predominant marketing to bridge the information gap between buyers and sellers (Asan et al., 2024; Sammer & Wustenhagen, 2006). The eco-labeling program is expanded in various sectors, such as manufacturing and service, agriculture, energy, and water.

Research on the buying intention of eco-labeled products is limited (Egea & Frutos, 2013; Pereira et al., 2022), although several empirical research conducted on pro-environmental behavior (Latif et al., 2019; Pandey et al., 2023; Ru et al., 2018, 2019; Shi et al., 2017), and green consumption (Mamun et al., 2018; Paul et al., 2016; Sharma & Dayal, 2016). Regarding eco-labeled product buying behavior, studies have been primarily conducted in Western and developed countries (Konuk et al., 2015; Tanner & Kast, 2003), and limited studies have explored developing countries on this matter (Biswa & Roy, 2015). There is a dearth of research on eco-labeled product purchase behavior in developing countries. Tan et al. (2019) studied the ecolabel product buying behavior of the young generation of Malaysia, while Choshaly (2019) studied ecolabel buying intention in Malaysia by applying the Diffusion Innovation Theory (DOI). However, there are some criticisms of the DOI theory application. It does consider individual resources, social support, or other cognitive aspects of individuals. Thereby providing limited insights about the buying behavior. Despite consumers' growing interest in eco-labeled products, very few studies explained the factors affecting buying eco-labeled products from developing countries' perspectives. Therefore, the purpose of this study is to determine the factors affecting eco-labeled product buying behavior from Malaysian young consumers' perspectives. The study also intends to identify the mediating effect of the constructs of theory of planned behavior (TPB) and take product knowledge as a moderator on the association between TPB constructs and eco-labeled product buying intention.
2 THEORETICAL FRAMEWORK

To explore the factors influencing eco-labeled product buying behavior, an extension of the theory of planned behavior (TPB) was employed in the study. A vast number of academic researchers employed the TPB to identify individuals’ actual behavior and intentions. According to Taylor and Todd (1995) and Ajzen (1991), TPB has been strengthened by research on social psychology and consumption-related studies. For example, Karajin and Iris (2007) conducted a study on halal meat buying intention in France and confirmed that perceived behavioral control, social norms, and attitude affect the expectation to buy halal meat. Concerning this issue, another study directed an investigation on fish item buying behavior and found that behavioral control, descriptive norm, social norm, and attitudes have a positive and significant association with the intention to buy (Tuu et al., 2008). Kim’s (2014) study is based on the TPB model for the consumption of genetically modified food products. The results revealed that perceived behavioral control, subjective norms, and attitude are significant predictors of buying intention.

Although TPB has been commonly used and endorsed in social psychology for its parsimonious understanding of rational behavior, several scholars have indicated that the model may be improved by adding various concrete determinants (Boley et al., 2018). Researchers (e.g., Ajzen, 1991; Conner & Armitage, 1998; Paul et al., 2016; Wang et al., 2016; Yadav & Pathak, 2016) commented that TPB is an open model and the integration of new variables can enhance the explanatory power of TPB. In the proposed extension of this study, the TPB model was used as the conceptual model with other cognitive and relevant variables, including environmental concern, environmental knowledge, perceived value, self-efficacy, eco-labeling, and consumer guilt, to measure the buying behavior of eco-labeled products.

Even though different examinations affirmed the association between buying intention and TPB constructs, very few of them utilized TPB variables (perceived behavioral control, subjective norm, and attitude) as mediators (Godin et al., 2004). Ajzen (1991) suggested that incorporating perceived behavioral control, social norms, and attitude is reasonable to be utilized as a mediator. Altawallbeh et al. (2015) revealed that TPB constructs fully mediate the association between additional external constructs and intention. Hence, these varied results require us to retest TPB constructs as mediation. Besides, Droms and Craciun (2014) used the perceived behavioral control and term self-efficacy (PBC) interchangeably, while
researchers (Parkinson et al., 2017; Yap & Lee, 2013) used them separately. Both constructs reflect on external and internal factors, but it is questionable whether they reflect similarly or separately (Parkinson et al., 2017). In this research, they are used as separate constructs where PBC included external and internal variables, whereas self-efficacy is internal, following Parkinson’s (2017) proposition.

Using TPB as a base model, this study developed a conceptual model, as shown in Figure 1. As can be observed, the eco-labeling product purchasing intention acquiring goes before the actual purchase procedure. The connection between environmental concern, subjective norms, perceived behavioral control, and attitude are additionally placed to have a positive and direct relationship in the current research. In this research, TPB constructs were also considered as the mediator between purchasing expectations and environmental concerns. However, an aggregate of 23 hypotheses was developed to identify the association between the dependent variable (purchasing intention of eco-labeled products) and independent constructs (environmental concern, subjective norm, self-efficacy, perceived value, environmental knowledge, eco-labeling, consumer guilt, perceived behavioral control, attitude). Consumer's actual behavior is also considered in this study. The directionality of the hypotheses specified in this research depended on past investigations and the basis of the TPB model.
2.1 ENVIRONMENTAL KNOWLEDGE

Environmental knowledge is an individual's knowledge about the surroundings where the people live, interconnected with the ecology system, and effort to be involved in environmental sustainability (Pagiaslis & Krontalis, 2014). Yadav and Pathak (2016) defined that "environmental knowledge refers to one's knowledge about environmental issues" and stated that environmental knowledge significantly affects green buying behavior. Setyawan et al. (2018) studied green product purchasing intention using an extended TPB model and found that environmental knowledge significantly influences attitude and buying intention. According to previous studies (e.g., Biswas & Roy, 2015; Egea & Frutos, 2013; Göçer & Oflaç, 2017), environmental knowledge is an essential factor influencing environmental intention and behavior. A green product is purchased by people who are aware of environmental issues and concerned about their impact (Alam et al., 2022; Pagiaslis & Krontalis, 2014). There will be a higher buying intention for green products if they are familiar with their environmental issues (Ko & Jin, 2017). Therefore, accordingly, we developed the following hypotheses:

**H1:** Environmental knowledge positively affects attitude toward eco-labeled products.

**H2:** Environmental knowledge positively affects eco-labeled product buying intention.
2.2 PERCEIVED VALUE

Perceived value is the overall evaluation of purchasing goods and services (Chen & Chang, 2012). Spreng and Patterson (1997) defined green perceived value as “a consumer's overall appraisal of the net benefit of a product or service between what is received and what is given based on the consumer's environmental desires, sustainable expectations, and green needs.”. Another study confirmed that green perceived value has a significant effect on the buying intention of green products (Doszhanov & Ahmad, 2015). In the Value-Attitude-Behavior Model, it was argued that the authors found that perceived value affects buying intention through attitude (Homer & Kahle, 1988). In the realm of tourism, people's behavioral intentions are influenced by their perceptions of the destination's worth (Wang, 2022; Yen & Teng, 2015). Yu and Lee (2019). Identified that green value is a significant predictor of green attitude. Therefore, we developed the hypotheses:

**H3:** Perceived value positively affects the attitude toward eco-labeled products.  
**H4:** Perceived value positively affects eco-labeled product buying intention.

2.3 ENVIRONMENTAL CONCERN

Environmental concern is the individual consciousness about the environmental deterioration around. Suki (2014) expressed that when an individual is furnished with knowledge and concern about the environment, it will urge them to show positive attitudes towards environmental products. The studies (Sang & Bekhet, 2015; Yadav & Pathak, 2017) reveal that environmental concern positively and significantly affects attitude and intention to buy green products. Jaiswal and Kant (2018) confirmed a significant association between environmental concern and buying intention and attitude toward India's green products. Similar results were also found in the study of Paul et al. (2016), which confirmed to have a significant relationship between buying intention and all TPB constructs. Thus, the following hypotheses are proposed:

**H5:** Environmental concern positively affects attitude.  
**H6:** Environmental concern positively affects subjective norms.  
**H7:** Environmental concern positively affects perceived behavioral control.  
**H8:** Environmental concern positively affects buying intention.
2.4 EFFECT OF TPB CONSTRUCTS ON BUYING INTENTION AND ACTUAL BEHAVIOR

An attitude is a psychological propensity that pertains to the judgments of consumers towards having the action; it is a consistent, evaluative response to an entity (Eagly & Chaiken, 1993). Attitudes can be positive or negative, and they can change over time. Consumers are more likely to buy a product if they have a favorable impression of it. Different researchers (Han & Yoon, 2015; Jin et al., 2020; Teng et al., 2014) confirmed a positive association between attitude and behavioral intention.

**H9:** Attitude positively affects eco-labeled product buying intention.

According to the term "subjective norm," one's impression of specific conduct is shaped by the opinions of people who are close to him or her (Jin et al., 2020). A particular social network and organization can have an impact on a consumer's behavior because of the influence of their friends, family, and the wider community (Giampietri et al., 2018). Various other researchers have recognized subjective norms as a significant construct in the buying intention of halal food (Alam & Sayuti, 2011), the intention to buy green products (Hsu & Chan, 2015), and organic food purchase intention (Irianto, 2015).

**H10:** Subjective norm positively affects eco-labeled product buying intention.

A considerable amount of research confirmed a positive and significant association between perceived behavioral control and behavioral intention in different research contexts, which incorporates recycling (Ramayah et al., 2012), intention to consume green products (Paul et al., 2016), green hotels (Teng et al., 2014), and behavior intention to waste separation (Zhang et al., 2015). From the point of view of a consumer who is thinking about buying eco-labeled products, the total set of accessible control beliefs includes a low price, the ability to buy, and the ability to get information about specific products (Ricci et al., 2018; Sillani et al., 2015). If customers had the impression that eco-labeled products were more readily available, there would be fewer factors that prevented them from making that choice. Thus, this research proposed the following hypotheses:

**H11:** Perceived behavioral control positively affects eco-labeled product buying intention.

**H12:** Perceived behavioral control positively affects actual behavior
2.5 ECO-LABELING

Eco-label is considered an essential tool in green marketing (Rex & Baumann, 2007). Prieto-Sandoval et al. (2016) stated that eco-labels are a multidimensional approach. Marketers can convey environmental benefits in many ways, and eco-label is one of them. Atkinson and Rosenthal (2014) mentioned that eco-labels are information tools that provide information about the usage, disposal, consumption, and production of the products. Nowadays, consumers are very much concerned about their environment. The term "eco-labeling" refers to any easily recognized mark that is affixed to a product or its packaging and indicates either a business or the performance of a product in terms of how environmentally friendly it is (Gosselt et al., 2017). Since eco-labels appear on items, researchers have concluded that customers' purchasing decisions are influenced by the labels' ability to help them locate environmentally friendly products and make the least environmentally detrimental purchases possible. Song et al. (2019) revealed that eco-label is a significant construct of green purchase behavior in the case of young Chinese. Therefore, the chances of accepting eco-labeled products are very high in this present situation. It is also relevant to this study, and therefore, we developed the hypothesis:

**H13: Eco-labelling positively affects buying intention.**

2.6 CONSUMER GUILT

Guilt is a multidimensional psychological approach that describes an emotion or state and character trait's cognitive side. Peloza et al. (2013) expressed that in marketing literature, it is easier to differentiate the violation of social and personal beliefs on ethics by guilt, and it is considered significant as it eventually momentum consumers to behave prosaically. Environmental protection is mainly known as a moral standard. Anticipated guilt occurs when a person challenges his perceived responsibility to the environment without supporting his/her moral standards. In this circumstance, the anticipated guilt relating to the environment would affect the possibility of behaving pro-environmentally and finally lead to the intention to consume green (Kabadayi et al., 2015). Likewise, Nguyen et al. (2021) found that guilt influences consumers' intention to buy meats, while Ki et al. (2017) identified a negative relationship between guilt and luxury product buying intention. Therefore, we developed the hypothesis:
**H14:** Consumers’ guilt positively affects eco-labeled product buying intention.

### 2.7 SELF-EFFICACY

Armitage and Conner (1999) used TPB, extended with including self-efficacy as an additional construct, and confirmed that self-efficacy significantly affects intention. Povey et al. (2000) argue that TPB predictive ability will increase if researchers include self-efficacy and perceived behavioral control. Armitage and Conner’s (2001) meta-analytic review results show that self-efficacy has a relatively stronger association with intention. A recent study conducted by Nystrand and Olsen (2020) on the consumption intention of functional food in Norway confirmed that self-efficacy is one of the most critical constructs influencing consumption intention. As a result, people are more likely to take action if they have a high degree of confidence in their abilities (Li, 2020; Vamvaka et al., 2020; Xu et al., 2022). In a recent study, Furner et al. (2018) found that consumers' trust in and willingness to make a purchase is boosted when they feel competent and confident in their abilities. Online buying intention and purchasing behavior were similarly influenced by self-efficacy, as demonstrated by Pea-Garca et al. (2020). Thus, we developed hypotheses:

**H15:** Self-efficacy positively affects eco-labeled product buying intention.

**H16:** Self-efficacy positively affects actual behavior

### 2.8 BEHAVIORAL INTENTION

Garbarino and Johnson (1999) examined the association between attitude and intention, whereas Homburg et al. (2005) examined self-reported behavior. Due to a lack of behavioral data, a limited number of researchers examined the influence of intention on actual behavior (De Canniere et al., 2010). According to Ajzen (2002), intentions are the direct construct of actual behavior. Moreover, Zeithaml (2000) opined that the mediation of intentions is widely researched, but the relationship with actual behavior lacks confirmation. The results of the study by Wee et al. (2014) reveal that buying intention significantly affects actual behavior. Researchers (Alam et al., 2020; Tang et al., 2021; Zheng et al., 2021) also considered behavioral intention in the model as they found a strong linkage with the actual behavior. Therefore, we develop the hypothesis:

**H17:** Buying intention positively affects actual behavior
2.9 MEDIATING EFFECTS OF TPB

A search of the literature revealed that very few studies had identified TPB constructs to mediate with purchase intention. Recently, Altawallbeh et al. (2015) and Paul et al. (2016) examined the TPB constructs' subjective norm, perceived behavioral control, and attitude as mediating variables. The consequences of these investigations demonstrated that TPB constructs mediate the connection between purchase intention and environmental concern. Altawallbeh et al. (2015) revealed that TPB constructs mediate the connection between behavioral intention and external variables. Thus, the present examination considered TPB constructs to have a mediating role in the connection between behavioral intention and environmental concern. The present study considered Saleem and Gopinath’s (2013) investigation, which proposed that environmental concern influences behavior and intention through subjective norms, perceived behavioral control, and attitude. The following hypotheses are developed:

**H18:** There is a positive mediating effect of attitude on the association between environmental concern and intention to buy eco-labeled products.

**H19:** There is a positive mediating effect of subjective norm on the association between environmental concern and the buying intention of the eco-labeled product.

**H20:** There is a positive mediating effect of perceived behavioral control on the association between environmental concern and the buying intention of the eco-labeled product.

2.10 MODERATING ROLE OF PRODUCT KNOWLEDGE

Few studies have confirmed the moderating effects of consumers’ product knowledge with the subjective norm, perceived behavioral control, and attitude with behavioral intention (Chen & Deng, 2016; Fu & Elliott, 2013). The researcher argued that customers with a significant level of information rely upon, for the most part, cognitive evaluation. Higher product knowledge levels will lead to greater green purchase intention because consumers have a better understanding of green product performance/price rate (Chen & Deng, 2016). Thus, the explanatory power of attitudes will decrease. Besides, Subjective norm is the apparent social strain to participate in specific behavior and is governed by a set of convictions that convey social esteems. Researchers identified green purchase behavior and
social behavior to be affected by individualist and collectivist orientation. Malaysia represents a collectivist culture where society plays a significant part in the decision-making process (Keshavarz & Baharudin, 2009). Hence, less knowledgeable people concur less certainty about them and tend to pursue other reference group members’ buying behavior. Likewise, higher product knowledge enhances confidence and leads to a favorable buying decision. Hence, the following hypotheses are developed:

**H21:** Product knowledge positively moderates the association between attitude and eco-labeled product buying intention.

**H22:** Product knowledge positively moderates the association between subjective norms and eco-labeled product buying intention.

**H23:** Product knowledge positively moderates the association between perceived behavioral control and eco-labeled product buying intention.

### 3 METHODOLOGY

#### 3.1 SAMPLE

The present study employed the primary data collection method to gather data for this research by distributing surveys controlled among consumers at three major shopping malls in Malaysia. Those shopping malls were located in Klang Valley. The justification for selecting the Klang Valley was because it is a densely populated area and is viewed as urbanized. The reason for which only shopping malls were chosen is that the study wanted to take the opinion of consumers who have sufficient earnings to make eco-labeled product purchases. Those shopping malls are the best places to locate such respondents in one place. We approached 500 respondents, and only 393 printed questionnaires were found to have correct responses in all sections. The other 107 questionnaires were incomplete, mainly when the respondents neglected to answer interest factors.

Overall, a more significant part of the respondents was female (60.56%); as expected, 25-35 years of respondents were the maximum, and the minimum age of the participants was above 45 years in this research. The mean age of the respondents is 29 years, and the Standard deviation is 0.718. The Chinese were the primary respondents out of the total respondents (51.65%), while the next group was Malays (44.27%).
3.2 MEASURES

All items were adopted or adapted from previously validated questionnaires to measure the instruments. Attitude, behavioral intention, and perceived behavioral control were adapted from the scales developed by Alam et al. (2012) and Alam and Sayuti (2011). The measures of perceived value and eco-labeling were adopted from the Study by Nhu et al. (2019), consumer guilt was adopted from the study of Kabadayi et al. (2015), and environmental knowledge was adopted from the study by Sidique et al. (2010). Self-efficacy was adopted from Nystrand and Olsen's (2020) study. The subjective norm was revised and modified from Vermier and Verbeke’s (2008) research, and product knowledge was modified and adapted from Chen and Deng's (2016) research. Moreover, environmental concern was modified and adapted from Yang (2014). Actual behavior was adopted from the study of Sethi (2018) and modified. In the survey, all the questions adopted a six-point Likert scale, which is represented by 1 "strongly disagree," 2 "disagree," 3 "somewhat disagree," 4 "somewhat agree," 5 "agree," and 6 "strongly agree."

3.3 COMMON METHOD BIAS

Based on the suggested guidelines by Harman (1967), common method bias was tested in this research by utilizing exploratory factor analysis. The Kaiser-Meyer-Olkin (KMO) standard was adopted to evaluate the sampling adequacy for factor analysis. The analysis findings demonstrated that all values in the matrix's diagonal were above 0.5, while the KMO value was at 0.859. Moreover, the Kaiser-Guttman standard and the screen test were applied to distinguish the number of existing variables. The evaluation demonstrated that eight factors have more principal eigenvalues than one, which accounted for 62.132% of the variance.

In contrast, the primary factor represented 29.5% of the variance in the factors. As per the factor analysis, more than one single factor showed up, and most of the variance was not represented by one general factor. Finally, the common method bias was tested by adding a marker variable based on the suggestion of Podsakoff et al. (2003). The average variance explained less than 1% with a common factor with each item and the marker variable. Along these lines, this affirmed that there was no presence of common method bias.
3.4 ANALYSIS OF THE DATA

Data were analyzed using the Smart-PLS package of 3.0 using PLS-based SEM over CB-based SEM. The reason is that PLS-SEM provides the strength and statistical significance of the individual path. Smart-PLS, path modeling, is commonly used to measure direct and indirect measures by various indicators for determining their causal relationship (Ringle et al., 2010). PLS-SEM works better than CB-based SEM in using interaction variables as a moderator in the complex model with larger constructs and items to run within a relatively moderate sample size (Lowry & Gaskin, 2014). This study did not test a single established model like TPB; instead, it proposed a comprehensive model with larger constructs featuring complicated relationships that exert no problem using PLS-SEM. PLS-SEM does not have the bindings to meet the normal distribution of research results. Thus, we adopted PLS-SEM. However, in two stages, PLS model criteria are evaluated: (1) measurement model assessment to exhibit reliability and validity of the construct, and (2) structural model assessment in determining the path coefficient and their significance (Hair et al., 2021).

The assessment of the measurement model was done to estimate the validity of the construct and internal consistency. Construct validity was examined by testing AVE (Average Variance Extracted) and composite reliability. All the constructs have an AVE value higher than 0.5, which implies convergent validity (Fornell & Larcker, 1981). The analysis result indicates discriminant validity as the value of AVE's square root in diagonal is higher than other constructs in off-diagonal (Fornell & Larcker, 1981), as shown in Table 1. In the PLS-SEM, construct reliability was tested by examining composite reliability (CR) scores. A value of CR higher than 0.7 indicates a good model and is considered highly acceptable for the early stages of research (Akter et al., 2011). The constructs of this study are considered statistically satisfactory as CR exceeds the cut-off values stated earlier. In addition to the Fornell-Larcker criterion, this study measured the HTMT value due to its supremacy over Fornell-Larcker in various situations (Henseler et al., 2015). The HTMT value is higher than 0.85/0.90, which suggests an absence of discriminant validity (Hair Jr. et al., 2021; Henseler et al., 2015). The present study satisfies the threshold value, as shown in Table 2. Overall, these results suggest that reliability and validity are not an issue for further analysis.
Table 1

Correlation of latent variables and square roots of AVE

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<td>0.506</td>
<td>0.585</td>
<td>0.942</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PBC</td>
<td>0.480</td>
<td>0.410</td>
<td>0.514</td>
<td>0.176</td>
<td>0.349</td>
<td>0.443</td>
<td>0.511</td>
<td>0.891</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PK</td>
<td>0.407</td>
<td>0.355</td>
<td>0.355</td>
<td>0.181</td>
<td>0.300</td>
<td>0.359</td>
<td>0.379</td>
<td>0.425</td>
<td>0.771</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PV</td>
<td>0.483</td>
<td>0.389</td>
<td>0.569</td>
<td>0.249</td>
<td>0.385</td>
<td>0.488</td>
<td>0.536</td>
<td>0.336</td>
<td>0.526</td>
<td>0.796</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SE</td>
<td>0.392</td>
<td>0.373</td>
<td>0.630</td>
<td>0.269</td>
<td>0.368</td>
<td>0.542</td>
<td>0.431</td>
<td>0.439</td>
<td>0.337</td>
<td>0.409</td>
<td>0.875</td>
<td></td>
</tr>
<tr>
<td>SN</td>
<td>0.456</td>
<td>0.416</td>
<td>0.658</td>
<td>0.258</td>
<td>0.356</td>
<td>0.737</td>
<td>0.495</td>
<td>0.351</td>
<td>0.300</td>
<td>0.450</td>
<td>0.651</td>
<td>0.926</td>
</tr>
</tbody>
</table>

Notes: AB= Actual Behavior, ATT= Attitude, PBC=Perceived Behavioral Control, BI=Behavioral Intention, CG= Consumer Guilt, EC= Environmental concern, ECO= Eco-labelling, PK= Product Knowledge, EK=Environmental Knowledge, PV= Perceived Value, SE= Self-efficacy, SN= Subjective Norm. In the table, bold elements are the square root of AVE

Testing the equality of variance, multivariate normal distribution, and independence of errors were first assessed in the current study. As has been referenced, this research included a moderately large sample (393 respondents), which led to the acceptance of the Central Limit Theorem. Consequently, there was no doubt about the normality of the data. As suggested by Kleinbaum et al. (1988), one effective technique, including the evaluation of the Variance Inflation Factor (VIF), was used to decide the presence of multicollinearity among independent variables in this research. The regression analysis outcome shows that the VIF ranges from 1.000 to 2.893, which indicated well below 10. This concludes that multicollinearity is not the issue in this study.

Table 2

Heterotrait-Monotrait ratio (HTMT)

<table>
<thead>
<tr>
<th></th>
<th>AB</th>
<th>Att</th>
<th>BI</th>
<th>CG</th>
<th>EC</th>
<th>EK</th>
<th>Eco</th>
<th>PBC</th>
<th>PK</th>
<th>PV</th>
<th>SE</th>
<th>SN</th>
</tr>
</thead>
<tbody>
<tr>
<td>AB</td>
<td>0.377</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Att</td>
<td>0.623</td>
<td>0.722</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BI</td>
<td>0.238</td>
<td>0.321</td>
<td>0.486</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CG</td>
<td>0.488</td>
<td>0.374</td>
<td>0.615</td>
<td>0.297</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EC</td>
<td>0.578</td>
<td>0.622</td>
<td>0.844</td>
<td>0.366</td>
<td>0.482</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EK</td>
<td>0.898</td>
<td>0.539</td>
<td>0.743</td>
<td>0.325</td>
<td>0.593</td>
<td>0.657</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eco</td>
<td>0.543</td>
<td>0.472</td>
<td>0.585</td>
<td>0.197</td>
<td>0.400</td>
<td>0.491</td>
<td>0.586</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PBC</td>
<td>0.371</td>
<td>0.336</td>
<td>0.282</td>
<td>0.170</td>
<td>0.251</td>
<td>0.336</td>
<td>0.342</td>
<td>0.379</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PK</td>
<td>0.598</td>
<td>0.483</td>
<td>0.709</td>
<td>0.309</td>
<td>0.484</td>
<td>0.585</td>
<td>0.665</td>
<td>0.402</td>
<td>0.636</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PV</td>
<td>0.494</td>
<td>0.485</td>
<td>0.803</td>
<td>0.337</td>
<td>0.472</td>
<td>0.679</td>
<td>0.547</td>
<td>0.553</td>
<td>0.406</td>
<td>0.581</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SE</td>
<td>0.529</td>
<td>0.498</td>
<td>0.775</td>
<td>0.304</td>
<td>0.426</td>
<td>0.847</td>
<td>0.580</td>
<td>0.404</td>
<td>0.307</td>
<td>0.573</td>
<td>0.854</td>
<td></td>
</tr>
<tr>
<td>SN</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>
Santosa et al. (2005) proposed a need to measure the models' explanatory powers by ascertaining the endogenous variable's coefficient of determination ($R^2$). Falk and Miller (1992) suggested that the $R^2$ of the endogenous variable ought to be 0.10. Cohen (1988) recommended, based on different research, that the value of $R^2$ of endogenous constructs is significant when the value is 0.26, followed by the value of 0.13, which is considered moderate; lastly, if the value is 0.02, it is considered weak. The $R^2$ estimations of every endogenous value found in this research are over the PLS analysis prerequisites, as recommended by Falk and Miller (1992). $R^2$ of this research is higher compared to the cut-off value, demonstrating that the model falls to an acceptable level in this manner.

4 RESULTS AND DISCUSSIONS

4.1 PARTIAL LEAST SQUARE-BASED STRUCTURAL EQUATION MODELING RESULTS

The PLS results in Figure 2 and Table 3 show the value of environmental knowledge on attitude ($beta = 0.436; t = 10.601; p < 0.01$) and environmental knowledge on buying intention ($beta = 0.278; t = 5.673; p < 0.01$). Similarly, perceived value significantly affects attitude ($beta = 0.146; t = 3.218; p < 0.01$ and buying intention ($beta = 0.142; t = 4.922; p < 0.01$). The connection between environmental concern and attitude is shown as the value of $beta = 0.077 (t = 1.748, p = 0.081)$, which showed a non-significant relationship. Therefore, hypotheses, $H1$, $H2$, $H3$, and $H4$, are supported, but $H5$ is not supported.
Predicting Eco-labeled Product Buying Behavior in an Emerging Economy through an Extension of Theory of Planned Behavior

Figure 2

Moderating model results

Table 3

<table>
<thead>
<tr>
<th>Hypotheses</th>
<th>STD Beta</th>
<th>STD Error</th>
<th>t-Values</th>
<th>P-Values</th>
<th>Confidence Interval 95%</th>
<th>Significance (p&lt;0.05)</th>
<th>f²</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1: EK -&gt; ATT</td>
<td>0.436</td>
<td>0.041</td>
<td>10.604</td>
<td>0.000</td>
<td>(0.365, 0.504)</td>
<td>Supported</td>
<td>0.195</td>
</tr>
<tr>
<td>H2: EK -&gt; BI</td>
<td>0.278</td>
<td>0.049</td>
<td>5.673</td>
<td>0.000</td>
<td>(0.186, 0.346)</td>
<td>Supported</td>
<td>0.100</td>
</tr>
<tr>
<td>H3: PV -&gt; ATT</td>
<td>0.146</td>
<td>0.045</td>
<td>3.218</td>
<td>0.001</td>
<td>(0.103, 0.195)</td>
<td>Supported</td>
<td>0.050</td>
</tr>
<tr>
<td>H4: PV -&gt; BI</td>
<td>0.142</td>
<td>0.029</td>
<td>4.922</td>
<td>0.000</td>
<td>(0.072, 0.139)</td>
<td>Supported</td>
<td>0.123</td>
</tr>
<tr>
<td>H5: EC -&gt; ATT</td>
<td>0.077</td>
<td>0.044</td>
<td>1.748</td>
<td>0.081</td>
<td>(0.008, 0.151)</td>
<td>NS</td>
<td>0.007</td>
</tr>
<tr>
<td>H6: EC -&gt; SN</td>
<td>0.356</td>
<td>0.039</td>
<td>9.078</td>
<td>0.000</td>
<td>(0.288, 0.420)</td>
<td>Supported</td>
<td>0.145</td>
</tr>
<tr>
<td>H7: EC -&gt; PBC</td>
<td>0.349</td>
<td>0.041</td>
<td>8.497</td>
<td>0.000</td>
<td>(0.282, 0.418)</td>
<td>Supported</td>
<td>0.139</td>
</tr>
<tr>
<td>H8: EC -&gt; BI</td>
<td>0.128</td>
<td>0.029</td>
<td>4.426</td>
<td>0.000</td>
<td>(0.061, 0.166)</td>
<td>Supported</td>
<td>0.036</td>
</tr>
<tr>
<td>H9: ATT -&gt; BI</td>
<td>0.200</td>
<td>0.029</td>
<td>6.926</td>
<td>0.000</td>
<td>(0.151, 0.242)</td>
<td>Supported</td>
<td>0.101</td>
</tr>
<tr>
<td>H10: SN -&gt; BI</td>
<td>0.070</td>
<td>0.043</td>
<td>1.641</td>
<td>0.101</td>
<td>(0.001, 0.137)</td>
<td>NS</td>
<td>0.007</td>
</tr>
<tr>
<td>H11: PBC -&gt; BI</td>
<td>0.070</td>
<td>0.028</td>
<td>2.530</td>
<td>0.011</td>
<td>(0.044, 0.132)</td>
<td>Supported</td>
<td>0.020</td>
</tr>
<tr>
<td>H12: PBC -&gt; AB</td>
<td>0.265</td>
<td>0.046</td>
<td>5.790</td>
<td>0.000</td>
<td>(0.189, 0.339)</td>
<td>Supported</td>
<td>0.078</td>
</tr>
<tr>
<td>H13: ECO -&gt; BI</td>
<td>0.100</td>
<td>0.035</td>
<td>2.829</td>
<td>0.005</td>
<td>(0.054, 0.175)</td>
<td>Supported</td>
<td>0.024</td>
</tr>
<tr>
<td>H14: CG -&gt; BI</td>
<td>0.125</td>
<td>0.026</td>
<td>4.794</td>
<td>0.000</td>
<td>(0.081, 0.172)</td>
<td>Supported</td>
<td>0.054</td>
</tr>
<tr>
<td>H15: SE -&gt; BI</td>
<td>0.163</td>
<td>0.033</td>
<td>4.894</td>
<td>0.000</td>
<td>(0.121, 0.237)</td>
<td>Supported</td>
<td>0.068</td>
</tr>
<tr>
<td>H16: SE -&gt; AB</td>
<td>0.025</td>
<td>0.044</td>
<td>0.558</td>
<td>0.577</td>
<td>(-0.048, 0.100)</td>
<td>NS</td>
<td>0.001</td>
</tr>
<tr>
<td>H17: BI -&gt; AB</td>
<td>0.398</td>
<td>0.050</td>
<td>7.994</td>
<td>0.000</td>
<td>(0.315, 0.478)</td>
<td>Supported</td>
<td>0.131</td>
</tr>
</tbody>
</table>

The outcome of PLS regression shows that the relationship among environmental concern, subjective norm (beta = 0.356; t = 9.078, p < 0.01), perceived behavioral control (beta = 0.349; t = 8.497, p < 0.01), and buying intention (beta = 0.128; t = 4.426, p < 0.001) are shown to be significant. Attitude significantly and positively affects behavioral intention (beta = 0.200; t = 6.926, p < 0.01), while no relationship was found between subjective norm and intention to buy (beta = 0.070; t = 1.641; p = 0.101). For the hypotheses, H11 and H12, the research results show a significant positive association (beta = 0.070; t = 2.530, p = 0.011)
between perceived behavioral control and intention to buy eco-labeled products and \((\beta = 0.265; t = 5.790, p < 0.01)\), perceived behavioral control and actual behavior, which seems to comply with all past studies cited in this study. Therefore, it is concluded that \(H_6, H_7, H_8, H_9, H_{11}\), and \(H_{12}\) are supported, but \(H_{10}\) is not supported according to the path coefficient results.

The results confirmed that the construct eco-labeling \((\beta = 0.100; t = 2.829, p < 0.01)\), consumer guilt \((\beta = 0.125; t = 4.794, p < 0.01)\), and self-efficacy \((\beta = 0.163; t = 4.894, p < 0.01)\) has a significant effect on the intention to buy the eco-labeled product. Meanwhile, self-efficacy does not have a significant effect on actual behavior \((\beta = 0.025; t = 0.558, p = 0.577)\). The self-efficacy significantly affects buying intention \((\beta = 0.163; t = 4.894, p < 0.01)\) and buying intention ultimately affects actual behavior \((\beta = 0.398; t = 7.994, p < 0.01)\). Thus, \(H_{13}, H_{14}, H_{15}, H_{17}\) are supported, but \(H_{16}\) is not supported.

Cohen (1988) portrayed \(f^2\) estimations of 0.02 to be minor, 0.15 as a medium, and 0.35 as high. All constructs shown in Table 3 have a negligible effect, though environmental knowledge with attitude has a medium effect. Finally, it can be seen that subjective norm with intention, self-efficacy with actual behavior, and environmental concern with attitude have no effects.

### 4.2 MEDIATION AND MODERATION EFFECTS

The current study used the bootstrapping technique to test the mediation effect of attitude, subjective norm, and behavioral control on the association between environmental concern and buying intention based on the suggestions of Hair et al. (2021). It is unnecessary to assume the products' sampling distributions or the indirect effect of the bootstrapping method (Hair et al., 2021). The mediating effect was tested with SmartPLS 3.0 with 393 cases and 5000 subsamples. The study results are shown in Table 4. Attitude mediates the association between environmental concern and behavioral intention \((\beta = 0.031, t = 2.605, p = 0.011)\), while subjective norm mediates environmental concern and intention to buy \((\beta = 0.025, t = 1.989, p = 0.043)\). Finally, perceived behavioral control mediates the association between environmental concern and intention to buy \((\beta = 0.024, t = 2.385, p = 0.017)\). Therefore, \(H_{18}, H_{19}, \text{ and } H_{20}\) are supported.
Table 4

Mediation and moderation testing results

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Path Coefficient</th>
<th>Standard Error</th>
<th>T-Values</th>
<th>P-Values</th>
<th>Significance (p&lt;0.05)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mediation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H18: EC -&gt; ATT -&gt; BI</td>
<td>0.031</td>
<td>0.009</td>
<td>2.605</td>
<td>0.011</td>
<td>Supported</td>
</tr>
<tr>
<td>H19: EC -&gt; SN -&gt; BI</td>
<td>0.025</td>
<td>0.016</td>
<td>1.989</td>
<td>0.043</td>
<td>Supported</td>
</tr>
<tr>
<td>H20: EC -&gt; PBC -&gt; BI</td>
<td>0.024</td>
<td>0.010</td>
<td>2.385</td>
<td>0.017</td>
<td>Supported</td>
</tr>
<tr>
<td>Moderation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H21: PK*ATT -&gt; BI</td>
<td>-0.034</td>
<td></td>
<td>1.375</td>
<td>&gt;0.05</td>
<td>Not Supported</td>
</tr>
<tr>
<td>H22: PK*SN -&gt; BI</td>
<td>0.107</td>
<td></td>
<td>5.116</td>
<td>&lt;0.001</td>
<td>Supported</td>
</tr>
<tr>
<td>H23: PK*PBC -&gt; BI</td>
<td>0.020</td>
<td></td>
<td>0.721</td>
<td>&gt;0.05</td>
<td>Not Supported</td>
</tr>
</tbody>
</table>

Utilizing PLCs structural equation modeling, this research examined the interaction effect of product knowledge on the association between TPB constructs: subjective norm perceived behavioral control, attitude, and endogenous construct buying intention of the eco-labeled product. The results in Table 4 show that product knowledge does not moderate the association between attitude and intention to buy and perceived behavioral control and intention to buy. In contrast, product knowledge moderates the association between subjective norms and buying intention. Therefore, H22 is supported, but H21 and H23 are not supported. The results of this study are consistent with the study of Chen and Deng (2016).

To illustrate how product knowledge can moderate the effects of other variables, we plotted the relationships at two different levels of the moderator (i.e., above and below one standard deviation from the mean, with the former representing high levels and the latter low levels, respectively) (Li & Tang, 2010). Figure 3 shows the moderating effect of product knowledge: when product knowledge is low, the green behavioral intentions decline; when product knowledge is high, the behavioral intentions of ecolabel products decline.
4.3 DISCUSSIONS

To find the critical drivers of eco-labeling product purchasing behavior amongst Malaysian consumers, the study attempted to integrate cognizance such as environmental concern, environmental knowledge, perceived values, self-efficacy, and consumer guilt along with related eco-labeling structure. Notably, in the extended model, the $R^2$ values of purchase intention and actual behavior were 0.355 and 0.756, respectively, which are greater than the values of 0.319 and 0.271 observed in the original TPB model (Si et al., 2020). Even this explanatory power is much greater than the studies previously extended TPB in the context of green purchase behavior for the dependent variable of intention (Zhang et al., 2019) and purchase behavior (Yadav & Pathak, 2017). These results showed that because extended TPBs can perceive green purchasing behavior, the proposed model is generally comprehensive, adequate, accurate, and functional for understanding eco-labeling product purchases.

There were significant positive relationships between the original TPB constructs, such as attitude, perceived behavioral control, and Behavioral intention, except for subjective norms. Attitudes toward an eco-labeled commodity, as one of the TPB key components, affect the purchasing intent. This result is consistent with previous studies (Han & Yoon, 2015; Paul et al., 2016; Verma & Chandra, 2018). The study proposed three cognitive predictors of attitude: environmental knowledge, environmental concern, and perceived value. All the factors are considered significant in estimating attitude except environmental concern, which
is in line with the study of Setyawan et al. 2018. This outcome signifies that the knowledge about environmental degradation and individual perceived value does result in attitude, but the environmental concern does not generate attitudes; instead, it contributes to directly forming buyer intention. Environmental knowledge constitutes the most significant effect on the formation of attitudes, similar to the study by Setyawan et al. (2018). In this research, attitude was revealed as the moderately influenced predictor of intentions, while in many past studies (Rajapaksa et al., 2019; Taufique & Vaithianathan, 2018; Yadav & Pathak, 2016), it was found to be the powerful predictor of intentions.

Conversely, subjective norms, the regular construct of the TPB, were not related to the behavioral intention. This result is consistent with past studies (Hsu & Chan, 2015; Paul et al., 2016; Tang et al., 2021) and opposite many previous studies (Teng et al., 2014; Verma & Chandra, 2018). This result means that subjective norm is not an essential determinant of behavioral intention. Though the subjective norms indicate external influence, it is not a surprise if we get insignificant. Ajzen (1991) noted that the subjective norms-intention relationship is weak for the TPB. To interact with this research, respondents feel that the suggestions they obtained from referents (peers, friends, and surrounding people) were not essential to promoting green product purchases. Since we took young people’s opinions, they may be different from other groups in making a buying decision, or they may be influenced by devices or social media instead of peer influence.

The influence of perceived control on intentions was found in the study to be significant. This finding is consistent with the original TPB (Ajzen, 1991) and preliminary studies showing substantially controlled intentions (Paul et al., 2016; Verma & Chandra, 2018). However, Kim et al. (2013) did not accept that finding, and they found that there was no significant influence on visit intentions of perceived power. Some concerns with perceived control have been reported in TPB literature, and in some studies, perceived control impacts of intentions are negligible (Ajzen, 2015; Yazdanpanah & Forouzani, 2015). It should be noted that PBC's behavioral intention effects were the lowest of the nine crucial projectiles. We also found that environmental buying intentions have a significant effect on purchasing behavior. The findings of this analysis are consistent with previous studies, where the purchasing intention was identified to influence actual behavior substantially. (Wee et al., 2014). The outcome is the same as that of TPB; behavioral intentions are direct behavioral predictor variables (Ajzen, 1991). Hypothesis 13 predicted that eco-labeling affects behavioral intention, which is proved in this empirical study in line with the past study of Chi
(2021), who studied green consumption intention in the Vietnam context. Although Tang et al. (2021) found that eco-labeling was the strongest predictor of green product buying decisions, in the present study, we did not find such intensity in relationships with intention.

As expected, environmental knowledge significantly affects attitude and eco-labeled product buying intention. These results are consistent with previous studies (Polonsky et al., 2012; Satyawan et al., 2018), which also found that ecological awareness was substantially correlated with green buying. This can be because inadequate awareness of environmental and social problems impedes the buyer's sustainable purchasing behavior. This finding also varies from many other studies. The direct association between environmental awareness and pro-environmental activities is weak (Laroche et al., 2002) or not apparent (Liu et al., 2020). The outcome suggested that individuals holding some environmental knowledge feel a positive attitude, leading to behavioral intention and subsequently motivating them to purchase the eco-labeled product. This aspect alone does not trigger the actual behavior to be executed. However, environmental knowledge was the most significant predictor of behavioral intention in the present study. Consumer guilt is also substantially associated with the intent to purchase eco-labeled goods, in line with previous studies (Kabadayi et al., 2015). This outcome shows that the degree to which consumers feel guilty about not upholding environmental obligations would go up to the eco-labeled product in their purchasing intentions.

The other cognitive factors proposed, i.e., self-efficacy, perceived value, and product knowledge, are connected with behavioral intention in this study. Self-efficacy, which means the individual’s ability to carry out a decision, is positively related to the buying intention. This result is similar to past studies (Armitage & Conner, 1999; Nystrand & Olsen, 2020). However, the research did not find any relations of self-efficacy differing from the prior Study by Hall et al., 2015. This outcome rejects the influence of self-efficacy on direct purchasing, which is opposite to the study of Alam et al. (2020) on the health perspective in Bangladesh. The possible reason that self-efficacy does not relate to actual behavior is that young people may be hesitant about deciding due to their limited earning abilities.

In contrast, green perceived value relates to the purchase intention of the eco-labeled product. The findings of this research are also consistent with the previous study conducted by Doszhanov and Ahmad (2015). This result signifies that if consumers feel a premium value in the eco-label product, their buying intention increases. The external factor of eco-labeling on the intention to purchase was tested, and it was found that eco-labeling affected intention.
This finding was in line with Hameed and Waris (2018). These findings confirm that buyers are resilient to eco-labels and are motivated by the value of goods contributing to green product buying. In the end, the excellent design of eco-labels would make consumers act environmentally friendly. Behavioral intention is found to be related to the actual behavior in earlier studies (Wee et al., 2014; Zheng et al., 2021), and the present study matched with the study of Alam et al. (2020) and Tang et al. (2021) who identified behavioral intention as the strongest predictor of actual behavior.

Regarding the mediation effect, attitude, subjective norms, and PBC were tested to mediate the relationship between environmental concern and behavioral intention. The present study confirms all these mediations confirming the prior studies (Altawallbeh et al., 2015; Paul et al., 2016). This result indicates that environmental concern influences eco-labeled buying intention if persons hold positive attitudes toward green products, are referred by their peers or surrounding people, and feel the discretion to decide independently. Attitude compared to other mediators is found to be more substantial between the environmental concern and buying intention of eco-labeled products. Hence, product knowledge is rejected as a moderator of the relationship between attitude, perceived behavioral control, and buying intention. This outcome is contrary to earlier studies (Chen & Deng, 2016; Fu & Elliott, 2013). That means know-how about products does not increase or decrease the buying intention if positive/negative, and people control belief about decision making. However, product knowledge is found to moderate the relationship between subjective norms and eco-labeled product buying intention, which is consistent with prior studies (Chen & Deng, 2016; Fu & Elliott, 2013). Social or peer influence would generate buying intention if the person were knowledgeable about eco-labeled products. This means that the greater the knowledge about ecolabel products, the greater the peer influence on the behavioral intention and vice versa.

4.4 IMPLICATIONS

This paper delivers some original contributions to the current literature, specifically on green buying behaviors and eco-labeling goods. First, the current research addresses the research gap by empirically examining the in-depth effects, and the underlying mechanism of eco-label informed green purchase and its acceptance in Malaysian perspectives. Unlike the past study in Malaysia (Tan et al., 2019), which showed the relationship of eco-labeling with actual behavior, this empirical examination brings forth a new relationship of eco-labeling
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with the intention. Thus, it contributes enormously to eco-labeling literature. Second, this study extended the TPB model with some cognitive constructs such as self-efficacy, perceived value, and external factors, eco-label enhancing its comprehensiveness to predict buying behavior. Third, this research simultaneously establishes the proposed model by its empirical test and validates it by excluding and including constructs contributing to its original model’s extended explanatory power. Fourth, the study also validates the measurement developed for this research; therefore, future researchers can replicate or expand this research as well. Fifth, this research offered some mediating and moderated relationships missing in the original model and for the eco-labeling products. Ethical self-efficacy moderates the association between perceived value and eco-labeled production buying intention. All TPB constructs were tested as mediators in the association between attitude, environmental concern, buying intention, and purchase behavior. Finally, this research did not stop with behavioral intention. The model considered self-evaluated behavior to get a better understanding of ecolabel buying behavior, which overcomes the limitations of many past researches (e.g., Choshaly, 2019) and accentuated the relevance of intention in predicting actual behavior.

This study suggests several managerial implications. First, assisting specific manufacturers or companies with valuable information can improve revenue by utilizing these research results. Ecological labels have an impact on customers’ buying behavior to some extent. So, marketers should put standardized nutritional facts on product labels. They can include information about calories, protein, and shelf life so that consumers can see how a specific product category can help them take care of their health. Also, the current study explored product knowledge's relationship directly and moderated ways with the attitude, subjective norms, perceived behavioral control, and behavioral intention to buy eco-labeled products. Thus, marketing professionals should relate green product knowledge considered by the consumers to create a certain awareness level. It is essential for the ultimate consumer and equally crucial to their family members, colleagues, and mentors so that marketers get their support in creating a pressure group in favor of buying. Thus, this can improve the client's impression of eco-label products in Malaysia. Second, perceived value is a vital predictor of buying intention. If consumers feel the eco-labeled product is valuable or premium in terms of status and passion, they will buy the product. Marketers should lucratively design their products and place the eco-label aesthetically to attract such consumers and give a premium feel. They can highlight such individual prestige issues and value to society through various campaigns. Third, perceived behavioral control was
positively and significantly associated with the intention of purchasing green goods, suggesting that if green products are more comfortable to reach, they would have a higher intention of purchase. Offering cheaper products may enhance the accessibility of green products. Retailers may help customers find their green goods by setting simple slogans and offering more open shelving.

5 CONCLUSION

The objective of this study was to find out the factors affecting ecofriendly-buying behavior in the Malaysian context. It also intended to identify the mediating effect of TPB constructs and product knowledge as a moderator on the association between TPB constructs and eco-labeled product buying intention. The empirical findings of this study showed that attitude, subjective norm, and perceived behavioral control mediate the relationship between eco-labeled product buying intention and environmental concern. There was a moderating effect of product knowledge on the effect of subjective norms and intention to buy. This study confirmed that attitude and perceived behavioral control significantly influence eco-labeled product buying intention. Hence, this shows that buyers have become more apprehensive about the situation, which implies that consumers will support eco-labeled products if the performance and quality are as good as the usual products. The findings also indicated that buyers might buy green products because they consider that they benefit their health. However, it is essential to note that subjective norms did not significantly affect the intention to buy eco-labeled products.

This study is not beyond the limitations. The time and situational imperatives motivated the respondents from inside the Klang Valley zone covering Kuala Lumpur and the rural areas within the Selangor states in Malaysia. Respondents were chosen based on convenience sampling due to time and budget limitations. However, the present study may pose a limitation of sampling bias as it only considers the dwelling of Kuala Lumpur. It could be with other regions also. Therefore, generalizing the present results on the overall population must be performed cautiously. Future researchers need to examine the motive behind eco-labeled product buying behavior and actual behavior, such as social benefits, health benefits, personal benefits, and environmental benefits. Malaysia is a multi-racial country, so it would be intriguing if future researchers research to examine culture as a construct. It is also suggested that a cross-country study be conducted using the constructs
applied in this research. However, the current research did not emphasize a specific category of eco-labeled products. Therefore, it is suggested that future researchers can focus on a specific category or categories of products.

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