

THE INHIBITING FACTORS OF GREEN PRODUCT PURCHASING BEHAVIOR: GREEN KNOWLEDGE AS A MODERATING EFFECT

Yunita Budi Rahayu SILINTOWE^{1, 2*}, I Made SUKRESNA¹

¹Faculty of Economics and Business, Universitas Diponegoro, Semarang, Indonesia

²Faculty of Economics and Business, Universitas Kristen Satya Wacana, Salatiga, Indonesia

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Abstract. This study aims to analyze the effects of inhibiting factors (i.e., habits, skepticism, and lack of availability) and green knowledge on the purchasing behavior of environmentally friendly products. This research also explains the moderating effect of green knowledge on the relationship between the inhibiting factors of green product purchasing behavior and green product purchasing behavior. Prior studies have not investigated the moderating effect of green knowledge on the relationships between the inhibiting factors and green product purchases. Data was generated through a cross-sectional survey of 743 residents throughout Indonesia and analyzed by Partial Least Squares (PLS) as a variance-based technique for Structural Equation Modeling (SEM). The results demonstrate that green knowledge is crucial in affecting eco-friendly product purchasing decisions and consumers' habits inhibit their decisions to purchase eco-friendly products. However, when moderated by better green knowledge, consumers who are not accustomed to purchasing eco-friendly products are more likely to make actual green product purchases. Further, the lack of green product availability demotivates consumers with higher green knowledge to purchase green products. This study offers practical implications for business actors by highlighting the importance of educating consumers on the positive environmental impacts of consuming green products and providing environmentally friendly products.

Keywords: green products, green purchasing behavior, green knowledge, habits, skepticism, lack of availability.

JEL Classification: F64, Q50, M30, M31.

Introduction

Environmental concerns have been a global issue that deserves continuous attention because of the increasing impacts of climate change and environmental degradation (Montt et al., 2018). Our offspring and future generation will bear the detrimental impacts without immediate and concerted efforts on these issues (Arrieta, 2021). Climate change has been a common concern. For instance, *Fortune* magazine has reported that the UN Climate Change Conference requested various countries to cooperate in mitigating climate change, especially in the Arctic area, where the temperature has increased at least three times faster than the global rate (Petroni & Solovieva, 2021). Various efforts have been launched, including the Blue Islands Charter, which aims to mitigate environmental degradation, contribute scientific knowledge related to the marine environment, enhance biodiversity, support other islands, and protect all species and habitats (BBC, 2021). Hence, environmental degradation is a serious issue that

shifts consumers' behaviors toward purchasing ecologically responsible products.

Previously mentioned environmental problems motivate most business owners to focus on eco-friendly products (Hojnik et al., 2019). Decisions that are focused on sustainability are crucial for both consumers and businesses (Gatzer & Magnin, 2021). The number of eco-friendly products has increased by more than 500% from 2007 to 2009 (Unruh & Ettenson, 2010). Even among executives, two-thirds see sustainability as a source of revenue, and half anticipate that green activities will provide them with competitive advantages. Environmental responsibility may serve as a foundation for growth and differentiation, as indicated by the significant transformation in corporate mindset and practices over the past decade (Winston, 2020). *Forbes* magazine reports that a new survey indicates consumers of all generations are willing to pay more for sustainable products than corporations anticipate (Petro, 2022). Still, expectations for green products have also been hampered by the perception that they are of lower

*Corresponding author. E-mails: yunitasilintowe@students.undip.ac.id; yunita.silintowe@uksw.edu

quality or do not really live up to their environmental claims (White et al., 2019). In addition, most consumers who have a favorable attitude toward green products and services are less likely to buy them (Whelan & Kronthal-Sacco, 2019). This issue is a serious concern for business owners in producing and educating eco-friendly products.

Business owners must assure consumers that their products are safe to consume while supporting environmental protection actions. Previous studies focus on the intention to purchase eco-friendly products (Cespedes-Dominguez et al., 2021; Chen et al., 2021; Salam et al., 2021). Several studies demonstrate the relationship between green purchase intention and green purchase behavior (Paul et al., 2016; Siddique et al., 2020; Taufique & Islam, 2021). However, Carrión Bósquez and Arias-Bolzmann (2021) document that green purchasing intention does not affect actual green product purchases, and the gaps between intention and actual behavior are likely greater in the Asian market (Nguyen et al., 2019). Besides, positive attitudes about eco-friendly products do not necessarily manifest in actual purchases (Adrita & Mohiuddin, 2020; Joshi & Rahman, 2015). Several factors contribute to the difference or gap between consumers' purchase intention and their actual purchases of eco-friendly products, which warrant further investigation.

This study is motivated by the suggested future research direction to explore the factors that affect or cause inconsistencies in green product purchasing behavior (Joshi & Rahman, 2015; Nguyen et al., 2019). Furthermore, this paper refers to an empirical study by Carrión Bósquez and Arias-Bolzmann (2021) demonstrates that habits are the only inhibiting factor of green product purchase behavior, and green product availability does not significantly affect green product purchases. Other studies indicate that skepticism significantly affects green product purchase intention (Nguyen et al., 2019) and green product purchase behavior (Albayrak et al., 2011). However, Mayangsari and Fabiola (2020) reveal that skepticism does not significantly affect green product purchase intention, while Nguyen et al. (2017) find that green product availability is an inhibiting factor of green purchase behavior. Hence, prior results remain inconclusive regarding the inhibiting factors of environmentally friendly product purchasing behavior. Likewise, there is a lack of empirical studies on the inhibiting factors of green product behavior.

This study differs from prior research by analyzing three factors that inhibit green product purchase behavior: habits, skepticism, and green product availability, and proposing green knowledge as the variable that moderates the effects of inhibiting factors on green purchasing decisions. Green knowledge is a moderating variable because consumers become more educated in environmental protection activities (Amoako et al., 2020), even through various platforms and media. Green consumption has been an increasing trend because consumers are more aware and responsible for environmental protection. Individuals adopt eco-friendly behaviors, like using eco-friendly

products to minimize carbon footprints (Chaudhary & Bisai, 2018). Consumers who are more knowledgeable about the environment have better environmental attitudes (Uddin & Khan, 2018). Further, better environmental attitudes encourage the use of environmentally friendly products (Singh & Gupta, 2020). This study focused in Indonesia region, since in terms of real value and global commerce aspect, Asia is rising rapidly than other regions, of which environmental services and resources sectors lead the market (Khanna, 2020). In addition to that, the region has experienced a sharp increase in green exports, earnings, and technology utilization to combat climate change.

The preceding arguments imply that habits, skepticism, and lack of availability inhibit the purchasing behavior of environmentally friendly products. Consumers' green knowledge is expected to help them overcome barriers to making ecologically responsible purchases. The contribution of this study is to explore the factors that hinder the buying behavior of environmentally friendly products by developing a novel research model with green knowledge as a moderating variable in an emerging country. Therefore, this study aims to examine the effects of inhibiting factors (i.e., habits, skepticism, and lack of availability) and green knowledge on the purchasing behavior of environmentally friendly products. This study also seeks to explain the moderating effect of green knowledge on the relationship between the inhibiting factors for purchasing green products and green product purchasing behavior. The following research questions are proposed based on the recommendations for future study directions, research gaps from prior research, and research contributions: (a) How do habits, skepticism, and lack of green product availability inhibit consumers' green buying behavior? (b) How does green knowledge affect green product purchase behavior? (c) How does green knowledge moderate the impacts of habits, skepticism about green products, and lack of green product availability?

1. Theoretical framework

1.1. Green product

Green products have lower environmental impacts and risks, use fewer resources, and prevent waste (Dangelico, 2016). Another study defines green products as those in which entire life cycle processes meet certain environmental protection requirements, are harmless or have minimal impacts on the ecological environment, are safe for human health, and consume less energy (Kuang et al., 2021). According to this definition, green products exhibit strong pro-environmental and pro-social characteristics. Green products are easy to reuse, maintain, and upgrade, harmless to the environment, reliant on less energy consumption and material usage, made from recycled materials, biodegradable materials, and eco-labeled (Ghazali et al., 2021). Thus, eco-friendly products are those that are not harmful to the environment, recyclable, sustainably consumable, and degradable (Singh & Gupta, 2020). The environmental labeling certifications and ecolabels that enable

consumers to identify products produced by firms or used with minimal negative environmental impact facilitate the growth of environmentally friendly products in Indonesia. Several common ecolabels in Indonesia include the Indonesian Ecolabel Institute, IEC Label, Environmentally Friendly Label, Green Product Council Indonesia Label, Green Label Indonesia, and Indonesian Self-Declaration Ecolabel (Tan, 2022). The following section explains various types of environmentally friendly products.

Prior studies indicate various green product types: organic farming products (Sobocińska et al., 2021), products with eco-labeled brands (Lin et al., 2017; Riskos et al., 2021; Salam et al., 2021), compostable coffee pods (Visser & Dlamini, 2021), green plastic products (Suhartanto et al., 2021), products with eco-friendly packages (Su et al., 2021), green apparel (Khare, 2020; Sadiq et al., 2021), organic food (Radojević et al., 2021), energy-efficient home appliances (Waris & Ahmed, 2020), and others. Various green products are produced and consumed to minimize their negative environmental impacts. Besides several varieties of environmentally friendly products that have been the subject of earlier studies, there are still a variety of these products all around us. Thus, this study focuses not on certain green products but on entire ones.

1.2. Green product purchase behavior

The introduction suggests that this study focuses on the purchasing behavior of environmentally friendly products, as consumers' intentions to purchase environmentally friendly products are frequently not followed by actual purchases. Environmentally friendly product purchasing behavior is crucial because this phase clearly indicates that consumers are concerned about the current situation of environmental degradation. This study will therefore concentrate on the actual purchasing behavior of green products. Eco-friendly purchasing behavior refers to purchasing products that are produced using eco-friendly materials and processes, of which consumption does not cause any environmental harm (Ali, 2021; Siddique et al., 2020). Increased environmental damages motivate green consumers to avoid environmentally harmful products. Another study identifies green product purchasing behavior as socially responsible behaviors that encourage consumers to make ethical purchasing decisions (Taufique & Islam, 2021). Such behaviors boost the prestige of purchasing green products among consumers. Sustainability practices in green product purchasing behavior escalate and indicate that consumers' purchasing decisions are affected by growing awareness and tendency for sustainability practices (Panda et al., 2020). However, although consumers increasingly consider sustainability practices in their purchasing decisions, some factors likely inhibit them in green product purchase behaviors, like their habits, skepticism, and green product availability (Carrión Bósquez & Arias-Bolzmann, 2021; Nguyen et al., 2019). The following sections discuss each inhibiting factor of environmentally friendly product purchasing.

1.3. Habits

Habits are a factor that can inhibit the green product purchasing process. Individuals display their habits spontaneously, recognizing signals that initiate low-level situational behavioral linkages that cause swift and effective responses with little deliberation beforehand (Gardner, 2015). Habits are the main obstacle in actual purchase of products among university millennials in Ecuador (Carrión Bósquez & Arias-Bolzmann, 2021). Investigating consumers' habits in purchasing eco-friendly products will likely reveal the differences between prior purchasing habits and future purchasing intentions (Wang et al., 2019). Consumers who have developed habits maintain their higher purchasing intentions by buying green products in the future. A study documents that prior habits and behaviors guide individuals' preferences and affect their purchasing behavior (Chiu et al., 2012). Thus, consumers' habits arguably affect their intentions to buy eco-friendly products and their future behaviors. However, Wang et al. (2019) demonstrate that consumers' habits in purchasing conventional products do not significantly affect green product purchasing intention. Habits significantly inhibit consumers from making environmentally friendly purchases because consumers frequently engage in these actions, which are internalized. This study indicates whether consumers are not accustomed to purchasing environmentally friendly products, organic products, energy-efficient equipment, and eco-labeled products daily. Thus, consumers will habitually purchase conventional products, inhibiting the purchases of environmentally friendly products. The arguments lead us to the following hypothesis:

H1: Greater habits of purchasing conventional products are associated with lower actual purchases of green products.

1.4. Skepticism

Skepticism refers to individuals' tendency to have doubts about information (Zhang et al., 2021). Skepticism changes marketing communication because consumers' skepticism of a brand's claim reduces its persuasiveness (Salam et al., 2021). Hence, one must consider skepticism when investigating consumers' green product purchasing behavior. A prior study explains that skepticism weakens consumers' decisions to purchase organic food products where the effect of personal norms on consumers' attitudes on purchasing organic food is greater when consumers exhibit lower skepticism levels on organic food than when they have greater skepticism (Činjarević et al., 2018) and skepticism negatively affects purchasing behavior that demotivates consumers not to purchase sustainably-labeled food products (Rossi & Rivetti, 2023). Consumers develop their skepticism because of different factors, including lack of information, ambiguity, lower credibility, lack of trust in certifying organizations, and too many product labels (Dangelico et al., 2021). Consequently, individuals have reservations about environmentally friendly products

likely because of the following factors. First, consumers believe that firms seek profits. Hence, they are skeptical of firms that label their products as environmentally friendly. Second, firms frequently launch marketing strategies to improve their products' ecological image without really enhancing their operations' environmental sustainability. Finally, consumers develop a mistrust of products or services labeled as environmentally friendly, causing them to continue purchasing products without such labels. Thus, skepticism will negatively affect green product purchasing behavior. Hence, it is hypothesized that:

H2: Greater skepticism on environmentally friendly products is related to lower actual purchases of green products.

1.5. Lack of availability

Numerous studies have demonstrated the inhibiting factors of green product marketing. The factors that significantly inhibit the purchases of eco-friendly products include limited access to them and their poor visibility. Tarkiainen and Sundqvist (2005) acknowledge that green product availability affects intention to buy and actual purchases. As an inhibiting factor of green product purchases, lack of availability is uncontrollable by consumers. In a similar vein, Sharaf and Perumal (2018) argue that green product availability does not affect green product purchases. In the green product market, lack of green product availability has been an obstacle to green product purchases that negatively affect green product purchasing intentions and behaviors (Wiederhold & Martinez, 2018). The lack of availability of environmentally friendly products is a barrier that prevents consumers from purchasing environmentally friendly products, as only a few environmentally friendly products are available on the market, only a few stores sell environmentally friendly products, it is difficult to find environmentally friendly products on the market, and it requires more efforts to obtain environmentally friendly products. Consequently, consumers will have no alternative but to continue purchasing non-environmentally-friendly products due to the difficulty of obtaining ecologically friendly products. Accordingly, it is hypothesized that:

H3: Higher levels of unavailability of environmentally friendly products are associated with lower levels of actual purchase of green products.

1.6. Green knowledge

Environmental knowledge refers to individuals' awareness of environmental issues, and it arguably affects consumers' purchasing behavior and is closely related to environmental attitudes (Visser & Dlamini, 2021). Consumers with higher environmental knowledge levels exhibit more positive environmental attitudes (Uddin & Khan, 2018). Similarly, Singh and Gupta (2020) observe that consumers with better environmental knowledge are more likely to use green products. Environmental knowledge is more directly related to environmental concerns and thus contributes

to eco-friendly product purchases (Singh & Gupta, 2020). Green knowledge is crucial to this study for the following reasons. First, consumers have received various environmentally friendly education from businesspeople who produce environmentally friendly products or services to increase their purchasing behavior for environmentally friendly products. Second, the Indonesian government has launched numerous environmental preservation efforts by educating the people on the significance of ecologically friendly approaches in various aspects, including the adoption of green economy since 2021. The acquired environmental knowledge will arguably mitigate the barriers for consumers to consume ecologically friendly products.

Prior studies have largely demonstrated that green knowledge is crucial in explaining green product purchasing intentions and behaviors. Several studies document that environmental knowledge affects green behavior and explores the positive relationship between environmental knowledge and behavior (Amoako et al., 2020; Hariharan & Shamini, 2019; Noor et al., 2017; Yadav & Pathak, 2016). However, several studies indicate that environmental knowledge does not necessarily lead to purchasing behavior (Ali, 2021; Bartiaux, 2008; Siddique et al., 2020). Meanwhile, Kumar et al. (2021) empirically found that consumers' knowledge of green products strengthens the impact of green information quality (information persuasiveness and information completeness) on green brand credibility. Besides, green knowledge also significantly moderates the relationship between green brand innovativeness and green perceived value (Lin et al., 2017), and environmental consciousness significantly moderates the relationship between green brand awareness and expected social contribution (Zhou et al., 2020). The moderating role of green knowledge remains understudied. This study develops a new model by adding the green knowledge construct as the moderating variable on the association between the inhibiting factors of the purchasing behavior of environmentally friendly products and actual purchases of these products that are not investigated in prior studies. Hence, it is hypothesized that:

H4: Consumers' better environmentally friendly knowledge is related to higher actual purchases of green products.

H5: Green knowledge moderates the relationship between habits and green product purchases.

H6: Green knowledge moderates the relationship between skepticism and green product purchases.

H7: Green knowledge moderates the relationship between lack of availability and green product purchases.

2. Methodology

2.1. Sample and data collection

This study was conducted in Indonesia, specifically on the islands of Java, Sumatera, Sulawesi, Kalimantan, Papua,

NTT, NTB, Maluku, and Bali, thereby encompassing all Indonesian regions. Indonesia is experiencing a dramatic increase in green exports, income, and the use of climate change-fighting technology. The sample was generated with the non-probability purposive sampling method with the criterion of Indonesian citizens above 17 years old who have purchased eco-friendly products. Individuals over 17 years in Indonesia are psychologically considered adults who can anticipate events and make decisions. Consequently, the selection of respondent criteria is appropriate to represent consumers' ability in green product purchasing behavior.

The survey was administered in Indonesian and created online with Google Forms for respondents' convenience. Before distributing the questionnaires, the survey instruments were evaluated from the perspectives of several marketing academics and environmental activists (employers of eco-friendly products and several environmentally friendly product users). The evaluation and trial findings suggested that several questionnaire items had to be reframed, and some unclear words were eliminated so that respondents could more readily comprehend them. The survey was performed for five months, and 782 questionnaires were gathered. The questionnaire checking indicated that 39 questionnaires were not filled in completely, and several respondents did not fill in the questionnaires seriously, resulting in 743 usable questionnaires. The questionnaires explained the green product definition and green product types purchased by the respondents to ensure that the respondents sufficiently understood the research background. Respondents were informed that there were no right or wrong answers to the questions and that all data would be confidential and used only for scientific purposes.

2.2. Measurement

The first section of the questionnaire asked general demographic questions like gender, age, monthly income, education level, and province. The second section asked about respondents' experiences in purchasing eco-friendly products, including whether they ever purchased eco-friendly products, types of eco-friendly products purchased, green purchasing behavior, green knowledge, and factors that inhibit their eco-friendly purchasing processes, such as habits, skepticism, and lack of availability. During filling out the questionnaire, respondents were required to provide complete respondent information and indicate or identify whether they had purchased environmentally friendly products to ensure that they met the previously established respondent criteria. This research measured all items with a 5-point Likert scale, ranging from 1 "strongly disagree" to 5 "strongly agree" (Sekaran & Bougie, 2016). A 5-point Likert scale was employed to improve response rate and quality while decreasing respondents' "frustration level" (Babakus & Mangold, 1992; Buttle, 1996; Soomro & Shah, 2021).

We measured green purchasing behavior using six items adopted and modified from Taufique and Islam (2021) and Ali (2021). We further developed four items to measure habits that inhibit consumers from purchasing eco-friendly products (Carrión Bósquez & Arias-Bolzmann, 2021; Wang et al., 2019). The skepticism variable was operationalized with five indicators adopted from Činjarević et al. (2018) and Carrión Bósquez and Arias-Bolzmann (2021). Following Mehra and Ratna (2014) and Wiederhold and Martinez (2018), we measured the lack of availability with four items. As the moderating variable, the last variable (green knowledge) was operationalized by developing five items to measure to what extent consumers are knowledgeable about eco-friendly products (Ali, 2021; Riva et al., 2021). Table 1 presents the complete variable and items.

Table 1. Variable and items

Variable	Items	Description	References
Green product purchasing behavior (GPB)	GPB1	I stopped purchasing items that are bad for the environment and have negative effects.	Taufique and Islam (2021); Ali (2021)
	GPB2	If there is a choice, I prefer to choose products that cause less pollution.	
	GPB3	If given the option, I would purchase a product that had fewer detrimental effects on both people and the environment.	
	GPB4	I purchase recyclable goods.	
	GPB5	I do not buy environmentally harmful household products.	
	GPB6	I buy energy-efficient household appliances.	
Habits (HB)	HB1	I'm not used to buying eco-friendly products.	Wang et al. (2019); Carrión Bósquez and Arias-Bolzmann (2021)
	HB2	I am used to buying non-organic products.	
	HB3	I am not used to buying energy-efficient equipment.	
	HB4	I don't usually buy things that have an eco-label.	
Skepticism (SK)	SK1	I do not believe in the information contained in labels or advertisements for eco-friendly products.	Činjarević et al. (2018); Carrión Bósquez and Arias-Bolzmann (2021)
	SK2	Most statements on labels or advertising for eco-friendly products are meant to deceive rather than inform consumers.	

End of Table 1

Variable	Items	Description	References
	SK3	The elimination of such statements on package labels in advertising will benefit customers because they are overstated, such as “healthy food,” “environment-friendly food,” and “eco food.”	
	SK4	The majority of claims on organic food product labels and in advertising are made to deceive people rather than to inform them.	
	SK5	I do not believe in most of the claims made on the organic food package labels or in advertising.	
Lack of availability (AV)	AV1	Only a few eco-friendly products are available on the market.	Mehra and Ratna (2014); Wiederhold and Martinez (2018)
	AV2	Only a few stores sell environmentally friendly products.	
	AV3	Eco-friendly products are hard to find in the market.	
	AV4	Getting eco-friendly products requires greater effort.	
Green knowledge (GK)	GK1	Eco-friendly products, in my opinion, provide higher quality than conventional products.	Ali (2021); Riva et al. (2021)
	GK2	I know more about recycling than the people around me.	
	GK3	I know a store that sells reasonably priced, high-quality eco-friendly products.	
	GK4	I am familiar with what the green label or symbol on product packaging means.	
	GK5	I'm familiar with social and environmental issues.	

2.3. Data analysis

There are two types of SEM methods, namely covariance-based structural equation modeling (CB-SEM) and variance-based structural equation modeling (VB-SEM) (Hair et al., 2019). CB-SEM seeks to confirm the theory by estimating a new covariance matrix that is not statistically different from the original observed covariance matrix. In contrast, the primary statistical objective of PLS-SEM is to make predictions that maximize the variance in the dependent variable. Our model is arguably quite complex because it involves numerous variables, including the moderator ones. As Chin (1998) suggested, PLS-SEM is considered more appropriate for analyzing complex relationships because it enables us to analyze the relationships between several latent variables simultaneously. Similarly, Hair et al. (2019) suggest that SEM is appropriate to simultaneously estimate numerous relationships or equations with several constructs that are represented by measured variables. Based on the factors above and the exploratory nature of this study, it would be more appropriate to analyze the data using PLS-SEM to obtain more robust results. In this respect, the SmartPLS software effectively helps us achieve the objective and tests the measurement (validity and reliability) and structural (relationships between variables) models. We conducted several tests: Factor Loadings, Cronbach's alpha (CA), Composite Reliability (CR), Average Variance Extracted (AVE), Fornell-Larcker criterion, and Heterotrait-Monotrait (HTMT) ratio. We run the bootstrap analysis of 500 sub-samples to have the estimation.

3. Results

3.1. Descriptive statistics of respondents' characteristics

The sampling criteria resulted in 743 valid questionnaires. We initially explained eco-friendly product types ever purchased by the respondents. In particular, organic vegetables and fruits, reusable straws, recyclable cutlery (for example, from wood), cooking utensils that are safe for health, eco-friendly cloth shopping bags, recycled paper tissue, recycled paper, eco-friendly laundry detergent, carbon-free soap and shampoo, silicone cups and children's toys, energy-efficient utensils, organic fertilizers, LED lights, beverage bottles, soap and shampoo with biodegradable contents were eco-friendly products most often purchased by the respondents. Table 2 presents the respondents' demographic profiles. Most respondents (490 or 65.9% of total respondents) are female. Most respondents are female, implying that women are crucial as decision-makers when purchasing a product or even inside their households. Our respondents exhibit an even age distribution; the largest age group is 35–43 years old (219 respondents or 29.5 percent), followed by the 26–34 years-old group with 218 individuals (29.3 percent). The figures confirm our expectations that most respondents already can think more critically about product purchasing behaviors. In terms of income, the sample is also evenly distributed, with 170 people (22.9 percent) earn between IDR 3,100,000 and 5,000,000, 153 people (20.6 percent) earn less than IDR 1,000,000, and 150 people (20.2 percent) earn between IDR 1,100,000 and 3,000,000. Most respondents (278 individuals or 37.4 percent) earn a bachelor's degree or equivalent, followed by 212 respondents with a master's degree (28.5 percent), suggesting that our

respondents are generally well educated. Although the questionnaires were distributed throughout Indonesia, the data distribution is still unbalanced because 376 respondents (50.6 percent) live on Java Island. This fact is not an issue because over fifty percent of Indonesia's population resides on the island of Java.

Table 2. Descriptive statistics of respondents' characteristics (source: primary data)

	Fre- quency	%		Fre- quency	%
<i>Gender</i>			<i>Education Level</i>		
Male	253	34.1	Senior high school	135	18.2
Female	490	65.9	Diploma [D1-D3]	72	9.7
<i>Age</i>			Diploma 4 / Bachelor	278	37.4
17-25	179	24.1	Master	212	28.5
26-34	218	29.3	Doctorate	46	6.2
35-43	219	29.5	<i>Island</i>		
44-52	91	12.2	Java	376	50.6
53-63	36	4.9	Sumatera	144	19.4
<i>Income</i>			Sulawesi	63	8.5
< IDR 1 million	153	20.6	Kalimantan	43	5.8
1.1-3 million	150	20.2	Papua	34	4.6
3.1-5 million	170	22.9	NTT	53	7.1
5.1-7 million	114	15.3	NTB	6	0.8
7.1-9 million	64	8.6	Maluku	15	2
> 9 million	92	12.4	Bali	9	1.2

Note: N = 743.

3.2. Reliability and validity assessment

The first measurement model generated three measurement items with the factor loading values below 0.708 (Hair et al., 2014). Thus, we had to leave out these three items in the subsequent analysis phase. The remaining 21 validated items were used in the hypothesis testing phase. Table 3 below presents the summarized reliability and validity tests of the 21 items. This table suggests that all factors were reliable because their composite reliability values and convergent validity (AVE) are higher than the lowest thresholds (0.70 and 0.50 respectively) (Hair et al., 2012). Furthermore, all measurement items' factor loadings exceeded the 0.708 threshold (Hair et al., 2014).

Table 4 displays the discriminant validity. We confirm the validity by comparing the square root of AVE to the corresponding latent variable correlations. The diagonal elements (italicized) are significantly greater than the off-diagonal elements in the respective rows and columns, demonstrating the discriminant validity of the variables (Fornell & Larcker, 1981). Moreover, all the variables values were under the threshold of 0.90, thus satisfying the Heterotrait-Monotrait (HTMT) ratio criterion (Henseler et al., 2015).

Table 3. Reliability and validity assessment

Variable	Items	Factor loading	Cronbach's alpha	CR	AVE
GPB	GPB1	0.768	0.782	0.859	0.604
	GPB4	0.761			
	GPB5	0.805			
	GPB6	0.773			
HB	HB1	0.800	0.842	0.894	0.678
	HB2	0.790			
	HB3	0.861			
	HB4	0.842			
SK	SK1	0.788	0.916	0.936	0.745
	SK2	0.853			
	SK3	0.837			
	SK4	0.903			
	SK5	0.927			
AV	AV1	0.834	0.886	0.920	0.742
	AV2	0.866			
	AV3	0.922			
	AV4	0.821			
GK	GK2	0.738	0.772	0.854	0.594
	GK3	0.774			
	GK4	0.805			
	GK5	0.764			

Table 4. Measurement model: discriminant validity

	GK	GPB	HB	AV	SK
Fornell-Larcker criterion					
GK	<i>0.771</i>				
GPB	0.493	<i>0.777</i>			
HB	-0.161	-0.217	<i>0.824</i>		
AV	-0.060	-0.125	0.301	<i>0.862</i>	
SK	-0.005	-0.085	0.503	0.347	<i>0.863</i>
HTMT ratio					
GK					
GPB	0.630				
HB	0.200	0.265			
AV	0.097	0.141	0.348		
SK	0.066	0.094	0.572	0.388	

3.3. Goodness-of-fit (GoF) index

We measured the GoF index of the model by dividing the geometric mean of the AVE average by the R² average (Tenenhaus et al., 2005), resulting in the GoF index of 0.473. Cohen (1988) and Wetzels et al. (2009) consider this GoF index large and to explain better than the baseline values. Thus, the model sufficiently validates the PLS model.

3.4. Structural model

Next, the structural model analyzed (see Figure 1), the research hypotheses. PLS relies on the blindfolding

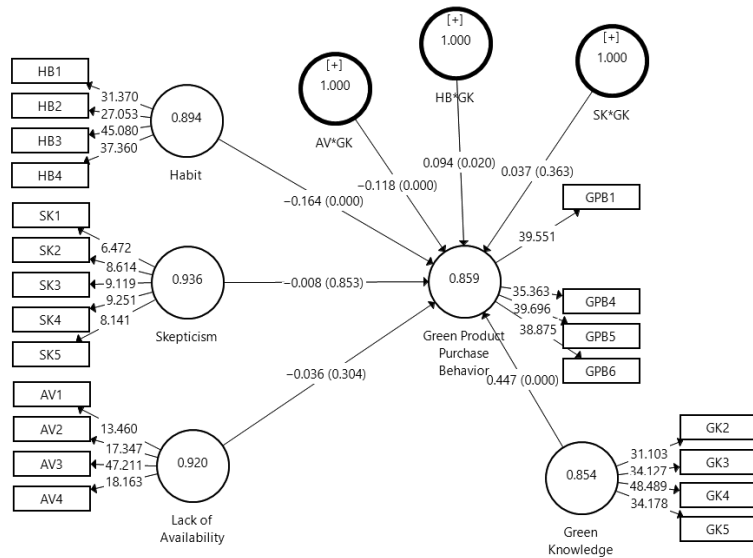


Figure 1. Structural model

procedure to calculate predictive capability, resulting in the cross-validated redundancy (the Stone-Geisser test Q^2) of 0.165, suggesting predictive relevance (Chin, 1998). Further, the R^2 value for the endogenous variable was 0.284 (higher than the minimum level 10 percent) (Falk & Miller, 1992).

We evaluated the influences of exogenous variables (i.e., habit, skepticism, and lack of availability) on the endogenous variable (i.e., green product purchasing behavior) using a bootstrapping resampling technique of 500 sub-samples. Table 5 presents the results of the path coefficients and itemized t-values. As predicted, habit is negatively associated with green product purchase behavior ($\beta = -0.164$, t -value = 3.684, $p < 0.05$). Hence, H1 is empirically supported. For the second hypothesis, skepticism toward green products has an insignificant influence on green product purchase behavior ($\beta = -0.008$, t -value = 0.186, $p > 0.05$), implying that H2 is not supported. In a similar vein, the lack of availability of green products has an insignificant influence on green product purchase behavior ($\beta = -0.036$, t -value = 1.029, $p > 0.05$), suggesting

that H3 is not supported. Further analysis shows that green knowledge is positively associated with green product purchasing behavior ($\beta = 0.447$, t -value = 13.855, $p < 0.05$), as posited by H4.

This study also investigates the moderating effects of green knowledge on the relationship between the independent variables (habits, skepticism, and lack of availability) and the dependent variable (green product purchasing behavior). Table 5 presents the results of the path estimates and t-values. In particular, green knowledge significantly moderates the relationship between habits and green product purchasing behavior ($\beta = 0.094$, t -value = 2.339, $p < 0.05$). Thus, H5 is supported. However, green knowledge does not significantly moderate the relationship between skepticism and green product purchasing behavior ($\beta = 0.037$, t -value = 0.911, $p > 0.05$), implying that H6 is not supported. Lastly, green knowledge significantly moderates the relationship between lack of availability and green product purchasing behavior ($\beta = -0.118$, t -value = 3.764, $p < 0.05$). Thus, H7 is supported.

Table 5. Statistical results of the structural model

Hypothesis	Path coefficient	t-value	P value	Result
Direct relationships				
H1 Habit → Green product purchasing behavior	-0.164	3.684	0.000	Supported
H2 Skepticism → Green product purchasing behavior	-0.008	0.186	0.853	Not supported
H3 Lack of availability → Green product purchasing behavior	-0.036	1.029	0.304	Not Supported
H4 Green knowledge → Green product purchasing behavior	0.447	13.855	0.000	Supported
Moderating effects				
H5 Habit x Green knowledge → Green product purchasing behavior	0.094	2.339	0.020	Supported
H6 Skepticism x Green knowledge → Green product purchasing behavior	0.037	0.911	0.363	Not supported
H7 Lack of availability x Green knowledge → Green product purchasing behavior	-0.118	3.764	0.000	Supported

Note: *Statistically significant at $p < 0.05$ (for t -value > 1.960).

4. Discussions

This study analyzes the impacts of the inhibiting factors of green product purchasing behavior, i.e., habits, skepticism, and lack of availability. Next, we also examine the effect of green knowledge on eco-friendly product purchasing behavior. Lastly, this study investigates the moderating effect of green knowledge on the relationship between the inhibiting factors of green product purchasing behavior and green product purchasing behavior. Our results empirically support several hypotheses related to the model. In particular, the PLS approach supports H1, suggesting that habits negatively and significantly affect green product purchasing behavior. The estimated value of habits is negative ($\beta = -0.164$), suggesting an inverse relationship between habits and actual purchase behavior. Thus, consumers with greater preference for conventional products exhibit lower actual purchase behavior of environmentally friendly products. The results are consistent with Carrión Bósquez and Arias-Bolzmann (2021) who explain that habits are a major inhibiting factor in actual purchases of environmentally friendly products. Their research indicates that the millennial generation underestimates organic products due to ignorance regarding the environmental impacts of consuming products lacking ecological characteristics. However, our results differ from Wang et al. (2019) who reveal that habits do not affect purchase intentions of environmentally friendly products. Meanwhile, our research shows that, of the three factors that inhibit eco-friendly product purchasing behavior, only habits influence green product purchasing behavior. The results indicate that consumers' habits in consuming conventional products are crucial in green product purchasing behavior. In this respect, consumers are likely not accustomed to buying eco-friendly products, organic products, energy-saving appliances, and eco-labeled goods. Thus, consumers who are not accustomed to buying eco-friendly products will exhibit lower eco-friendly product purchasing behavior. A lack of environmental awareness may be one of the reasons why consumers do not purchase environmentally friendly products, given that individuals often exhibit habits spontaneously with little consideration (Gardner, 2015).

Next, our quantitative analysis demonstrates that skepticism and lack of availability do not significantly affect green product purchasing behavior. Hence, H2 and H3 are not supported. In other words, consumers' skepticism of eco-friendly products does not affect their behavior in buying eco-friendly products. Besides, the lack of eco-friendly product availability does not affect consumers in purchasing eco-friendly products. The findings are consistent with a study in Ecuador documenting that skepticism and lack of availability do not affect eco-friendly product purchasing behavior (Carrión Bósquez & Arias-Bolzmann, 2021). However, Nguyen et al. (2019) recommend future studies to explain why the skepticism variable is not empirically supported. Further, Sharaf and Perumal (2018) also reveal that the lack of green product availability does not affect

Malaysian consumers' green product purchasing behavior. This study explains that skepticism and lack of availability do not affect the purchasing behavior of environmentally friendly products because consumers are still less aware, or even unaware, of the existence of products with environmentally friendly labels and do not comprehend the positive impacts of using such products. Obviously, this indifference stems from consumers' ignorance of the environmental damage caused by the negative effects of non-ecological products. This research contrasts with prior studies indicating that customer distrust of green products (Rossi & Rivetti, 2023) and the lack of availability of green products (Wiederhold & Martinez, 2018) are the factors inhibiting consumers from purchasing environmentally friendly products.

We also used PLS to investigate the impact of green knowledge on eco-friendly product purchasing behavior. The standard path coefficient of the structural model suggests that this variable significantly affects green product purchases. Hence, H4 is empirically supported. The results validate prior studies documenting that green knowledge determines eco-friendly product purchasing behavior (Amoako et al., 2020; Hariharan & Shamini, 2019; Noor et al., 2017; Singh & Gupta, 2020). These findings indicate that green knowledge is crucial because consumers who are more educated on the importance of environmental protection are more likely to buy green products. Consumers' knowledge of environmental concerns and causes of environmental degradation might improve their motivation to act more responsibly toward the environment by purchasing green products (Amoako et al., 2020). Green knowledge is crucial for consumers to comprehend how a product is created in an environmentally responsible manner and its overall environmental impacts (Hariharan & Shamini, 2019). When environmental issues are acknowledged, environmental knowledge can affect consumers' purchase intentions for green products by altering environmental attitudes (Yadav & Pathak, 2016). Environmental knowledge is arguably directly related to environmental concerns and contributes to green product purchasing (Singh & Gupta, 2020). To investigate further the impact of green knowledge, we also analyze the moderating role of green knowledge on the relationship between the inhibiting factors of green product purchases (habits, skepticism, and lack of availability) and green product purchasing behavior.

The tests of the moderating effect of green knowledge yield various results. In particular, green knowledge significantly moderates the impacts of habits on green product purchasing behavior. Thus, H5 is empirically supported. Without the moderating effect of green knowledge, habits negatively affect green product purchases, implying that consumers who are not accustomed to using eco-friendly products buy fewer eco-friendly products. However, when the relationship is moderated by green knowledge, habits positively affect green product purchases. The findings suggest that consumers who are not accustomed to buying

eco-friendly products but have better green knowledge will buy more green products. Hence, green knowledge is crucial in changing consumers' habits in purchasing green products. Our findings are crucial because better green knowledge will weaken the effect of purchasing habits of conventional products on environmentally friendly purchasing behavior. Consumers with greater environmental knowledge will exhibit better environmental attitudes (Uddin & Khan, 2018) and eventually put more effort into consuming green products (Singh & Gupta, 2020). Green knowledge is then crucial in bolstering environmental protection activities. It is then necessary to continue educating the public about the significance of environmental preservation efforts through various products, such as those with eco-friendly labels, to make greater social contributions (Zhou et al., 2020).

Next, green knowledge does not significantly moderate the impact of skepticism on green product purchases. Thus, H6 is not empirically supported. The result explains that although moderated by green knowledge, skepticism still cannot affect eco-friendly product purchases. The impacts of skepticism on green product purchases do not differ significantly in all green knowledge levels (low and high green knowledge levels). Further, green knowledge negatively moderates the impact of lack of availability on green product purchases, thus supporting H7. The finding indicates that the impacts of lack of green product availability on green product purchases differ significantly in low and high green knowledge levels. The negative moderating effect implies that although consumers exhibit high green knowledge levels, lack of green product availability still inhibits green product purchases. Although consumers are aware of environmental damage and the negative impacts of conventional products, their purchasing behavior of environmentally friendly products remains limited if they are not easily available. Consumers with better green knowledge need product availability in the markets, and these consumers will continue buying non-green products when eco-friendly products are not easily available. There should be a balance between environmental education and the availability of green products to facilitate consumers to use them easily.

The results imply that green knowledge motivates consumers to be aware of environmental degradation and buy green products to participate in environmental protection (Vitell, 2015). Further, the descriptive statistics of this study reveal that consumers have frequently made actual eco-friendly product purchases but are unaware that they have participated in environmental protection activities. Thus, business actors must provide product-related information in participating in environmental protection activities. Consumers' positive experience with green products also needs to be widely socialized to further inform the public about the significance of community participation in environmental protection activities to achieve healthier lifestyles.

Conclusions

This study documents important findings related to the practical implications of eco-friendly practices. Green knowledge and eco-friendly product purchasing behavior remain crucial and interesting research topics, and our study demonstrates that green knowledge is crucial in affecting eco-friendly product purchasing behavior. This study reveals that consumers' habits in consuming conventional products inhibit consumers from purchasing eco-friendly products. Consumers who are less accustomed to consuming eco-friendly products exhibit lower eco-friendly purchasing behavior. Interestingly, the moderating effect of green knowledge causes habits to affect green purchasing behavior positively. Hence, higher green knowledge alters the impact of consumers' habits on green product purchases. Green knowledge enables consumers to have more detailed information on eco-friendly products – including how these products are produced, promoted, and packaged – that will be considered by these consumers in purchasing decisions (Mohd Suki & Mohd Suki, 2015). Further, green knowledge negatively moderates the impact of the lack of green product availability on green product purchases. The lack of green product availability inhibits consumers with higher green knowledge from purchasing green products.

Our findings provide theoretical implications for academics and scientific development and recommendations for future research on consumers' behavior in using environmentally friendly products to focus more on the inhibiting factors of green product purchases and the significance of green knowledge to increase green product consumption. This study provides new insight into the marketing literature by highlighting that consumers' habits in using conventional products become the main inhibiting factor of green product purchases. However, consumers' green knowledge can mitigate the negative effect of habits, and thus, green knowledge is crucial in consumers' actual green purchases. Additionally, we also indicate that lack of green product availability inhibits green product purchases, although consumers exhibit higher levels of green knowledge. Thus, this study expands our understanding of mitigating the inhibiting factors of consumers' green product consumption.

Our study offers the following managerial implications for business actors in green products. First, firms must aggressively utilize various marketing channels and convince eco-labeling. These efforts will help firms socialize convincing eco-friendly products. Marketing content like green products with excellent ingredient quality and competitive prices will enhance consumers' awareness and encourage repeat purchases and satisfaction (Mohd Suki, 2016). These strategies also likely contribute to business continuation. Second, firms must educate their consumers about the positive impacts of consuming green products to motivate these consumers to buy eco-friendly products. They have to instill consumers' crucial roles in practicing

green business practices within competitive markets to their consumers. Third, firms can offer eco-friendly products with the best quality and affordable prices to compete against conventional products (Mohd Suki, 2016). These efforts will indirectly improve consumers' knowledge by demonstrating green products' health benefits. Fourth, business actors must prioritize the market availability of green products to help consumers acquire green products more easily.

This study is subject to several limitations that can be addressed by future research. First, although we aimed to generate samples throughout Indonesia, more than 50% of our actual sample hail from Central Java Province. However, it is less of a problem because this province makes up a significant proportion of Indonesia's population. Second, this study has not investigated the moderating effects of sex, income, age, and education level. We advise future studies to analyze the moderating effects of these demographic factors because the results likely differ depending on sex, income, age, and education level.

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