Future Business Journal

RESEARCH Open Access

Online environmental platforms service and green consumer behavior nexus: a multi-mediator study

Seemab Rana[1], Fazilathunissa Shafi[2], Aimen Rasheed[3] and Muhammad Imran Malik[4*]

Abstract

Green purchase behavior in Pakistan faces challenges due to lack of awareness, limited availability, and greenwashing by companies that demand use of online environmental platforms. The study aims to examine the effect of Online Environmental Platforms Service on green purchase behaviors of customers who intend to buy green energy products. Moreover, the indirect effects of environmental attitude, price sensitivity and impulsiveness are examined as mediators. The relationships are examined in light of theory of planned behavior. The data from a sample of 301 customers were gathered using a closed-ended questionnaire. The customers aged between 30 and 50 years were considered for the study. The findings unequivocally reveal that the provision of online environmental platforms has a profound effect on the ecological shopping inclinations of customers. The green purchase behavior of consumers is amplified, as is their green purchase attitude and consumer impulsiveness. However, an alert emerges—price sensitivity, despite its noteworthy impact on consumer behavior, curiously, impedes actual green purchasing. Investigating deeper, it becomes apparent that the remarkable impact of online environmental platforms is mediated by two factors: the green consumer attitude and consumer impulsiveness. These two factors act as conduits for the transmission of the influence of the online platforms, empowering consumers to make eco-conscious decisions. The marketers can enhance green purchase behaviors among customers by making effective use of the online environmental platform services. The Online Environmental Platforms Services can enhance sales and can be an effective strategy for high profits.

Keywords Sustainability, Online Environmental Platforms Service, Green consumer behavior, Environmental attitude, Price sensitivity, Impulsiveness, Green energy products

Introduction

Sustainability is threatened due to the rapid environmental degradation, which can be addressed through green purchase behavior. Green purchase behavior (GPB) is the collection of actions directed toward purchasing environmentally friendly products that reduce the environmental impact of their consumption patterns [54]. In Pakistan, several challenges hinder the adoption of green purchase behavior, i.e., the lack of awareness and education about sustainable consumption. Mahasuweerachai and Suttikun [43] found only 20% of Pakistani consumers have awareness of eco-friendly products. Additionally, the lack of information about the availability of eco-friendly

*Correspondence:
Muhammad Imran Malik
im4imranmalik@gmail.com
[1] Business Studies Department, University of Technology and Applied Sciences, Salalah, Oman
[2] University of Technology and Applied Sciences, Salalah, Oman
[3] Department of Management Sciences, SZABIST University Larkana, Pakistan
[4] Department of Management Sciences, COMSATS University Islamabad, (Attock Campus), Attock, Pakistan

products in local markets and limited options makes it difficult for consumers to make sustainable choices [38]. Finally, there is a lack of trust and transparency in the market, as many companies engage in greenwashing, which is the practice of making false or exaggerated claims about the environmental benefits of their products [10]. This creates confusion and distrust among consumers, making it difficult for them to make informed decisions about their purchases. The lack of information about sustainable consumption can be a barrier for consumers. However, online environmental platform service (OEPS) can bridge this gap by providing clear and concise information [84]. Online Environmental Platforms Services are source of information about sustainable consumption practices, helping to increase awareness and understanding of green behavior [42]. Online environmental platforms are becoming crucial for consumers to make more environmental-friendly decisions. The studies have examined the direct relationship between OEPS and GCB [53]; however, the mediating role of environmental attitude remained unexamined and needs further investigation to understand how it mediates the relationship between OEPS and GCB [23]. As per theory of planned behavior the attitudes provide foundations to get into the actual behavior. Moreover, insufficient exploration of price sensitivity as a mediator between OEPS and GCB helps understanding how price sensitivity influences online environmental practices and consumers' green behaviors that can provide valuable insights for businesses and policymakers [35]. Simultaneously, limited insight into consumer impulsiveness as a mediator in the relationship between OEPS and GCB in Pakistan remains understudied. Generally, it is noted that higher levels of impulsiveness tend to prioritize immediate gratification over long-term environmental concerns, and however, impulsive people with desire to promote sustainable products can lead to positive green purchase behavior to align with personal values and make a positive environmental impact. It can contribute to a comprehensive understanding of the underlying mechanisms [20].

Online platforms can increase trust in the market by providing consumers with information about the environmental practices of companies [85]. Consumers who use online environmental platforms are more likely to engage in green behavior, such as recycling and using reusable products [84]. Online platforms can help to create a sense of community among environmentally conscious consumers, which can further encourage green behavior [74]. Conversely, it is noted that online environmental platforms can have negative effects on green purchase intentions. These negative effects include information overload, conflicting messages, and skepticism about the credibility of the information provided [29]. Online environmental platforms may also create a sense of "green fatigue" among consumers, making them less likely to engage in environmentally conscious behavior [5]. These contradictory findings show that online environmental platforms not entirely shape consumers' green behavior but certain other factors too. Online Environmental Platforms Service may have positive or negative effects on green consumer behavior [42], that is why it is necessary to conduct mediation analysis helps in understanding the underlying mechanisms or processes through which the OEPS effects GCB. Moreover, we can examine how these variables mediate the relationship and shed light on the specific psychological and behavioral pathways involved. Further, we can evaluate the validity and robustness of the theoretical model and gain insights into the complex interplay between these variables.

Environmental attitude is the individual's overall beliefs, feelings, and values toward the natural environment. It encompasses attitudes toward specific environmental issues, such as climate change, pollution, and conservation efforts. Environmental attitude plays a significant role in influencing consumer green behavior. Individuals with a more positive environmental attitude are more likely to engage in green behavior, such as recycling, using eco-friendly products, and reducing energy consumption [29]. The price sensitivity is the degree to which consumers' purchasing behavior changes in response to changes in the price of a product or service. Highly price-sensitive consumers are likely to switch to alternative, cheaper products or delay their purchases until prices drop [66]. It significantly impacts consumer green behavior. Price sensitive consumers have weaker tendency to purchase the environmental friendly products with higher price tag than their traditional counterparts. [25]. However, this effect can be mitigated by the availability of information about the benefits of environmentally friendly products and the availability of cheaper, eco-friendly alternatives [85]. Further, the impulsiveness is a tendency to act without thinking, making decisions based on immediate desires rather than long-term consequences. Generally, it is negatively linked to environmental behaviors by producing decreased pro-environmental attitudes and behaviors. This effect may be due to impulsive consumers placing a higher value on immediate gratification than on future environmental outcomes [66]. However, it is likely that with limited income, and a strong emphasis on interpersonal relationships people in Pakistan make impulsive decisions to buy the green energy products and use them for long. Impulsiveness can lead consumers to make poor choices when it comes to making final purchase decision.

This study aims to explore how the utilization of online environmental platforms influences consumers' attitudes

toward the environment, their sensitivity to price factors, and their impulsive buying tendencies, and how these factors mediate the relationship between OEPS and GCB. By investigating these mediators, we can gain insights into the underlying mechanisms that drive green consumer behavior in the context of online environmental platforms in Pakistan.

This study offers several unique contributions compared to available literature. Firstly, this study explores the impact of online environmental platforms on consumer behavior in a developing country like Pakistan, a collectivist country with people generally have their opinion leaders and try to follow them, where the impact of such platforms on green purchase behavior is less researched [44]. Secondly, this study takes into account the mediating role of environmental attitude, price sensitivity, and impulsiveness, which is not commonly explored in previous research studies [5, 84, 85]. Finally, this study offers important implications for policy makers and businesses in Pakistan, as it sheds light on the potential of online environmental platforms in promoting green purchase behavior and the factors that influence it. Moreover, these relationships are examined in light of theory of planned behavior-TPB [61], which proposes that individuals' attitudes, norms, and control can be influenced by various factors. These factors may not be explicitly or consciously evaluated during decision-making, but they provide a framework for the decision-making process and motivate individuals to adopt preferred purchasing behaviors.

Examining the impact of online environmental platforms on green consumer behavior in Pakistan has implications for businesses and marketers. It enables the development of effective strategies to promote sustainable products and services through online channels. Insights from the study can guide the creation of persuasive messaging, targeted campaigns, and online engagement tactics to influence consumers' intentions to engage in environmentally friendly behaviors. This understanding empowers organizations to drive positive change and encourage sustainable consumption patterns through digital platforms.

Moreover, the impact of online environmental platforms on green consumer behavior holds great importance, particularly in the context of Pakistan. This research is significant both theoretically and practically. Theoretical implications stem from the utilization of the Theory of Planned Behavior (TPB) as the base theory. Investigating how online platforms influence consumers' attitudes, subjective norms, and perceived behavioral control toward green consumption can contribute to the advancement and validation of the TPB in the context of environmental behavior.

The novelty of this study lies in its exploration of the relationship between online environmental platforms and green consumer behavior in Pakistan, with a focus on three key mediators: environmental attitude, price sensitivity, and impulsiveness. While previous research has examined the impact of environmental attitudes on green consumer behavior, this study goes further by considering the influence of these additional mediators. The study highlights the potential for online platforms to promote pro-environmental behavior among consumers in Pakistan and suggests that environmental attitude, price sensitivity, and impulsiveness can all play a role in shaping this behavior.

Theoretical background, research model and hypotheses development

Theory of planned behavior—TPB

The theory of planned behavior [2] provides the foundation to develop the following framework. The theory states that there are certain factors that shape consumer intentions to purchase that further leads to actual adoption of the purchase behavior. The factors that shape the consumer intentions include the consumers attitude, subjective norms and perceived behavioral control. The framework developed for this study posits that there are certain factors that help shape attitude and perceived behavioral control such as the Online Environmental Platforms Services. The online environmental platforms have the power to influence the attitudes and can have an important toll to control the behaviors of customers by providing them the knowledge, information about process, availability, persuasion and so forth. As knowledge and persuasion are meaningful sources of shaping consumers attitudes [87]. Such forums have a strong influence on the adoption of the consumer impulsive behavior [35]. These mechanisms further motivate customers to adopt the actual purchase behavior.

Green strategies can be employed to safeguard the physical environment comprising air, water, and soil, as per the studies conducted by Zeynalova & Namazova [87] and Choi & Lee [16]. By instilling green attitudes and behaviors among energy consumers, the environment can be further nurtured. The study formulates hypotheses based on the available literature.

OEPS and GPB

Green consumers are individuals who prioritize the protection of both themselves and the environment by making environmentally conscious decisions. These consumers display various environmentally friendly behaviors, such as ecological behavior [32], responsible consumer behavior [72], and sustainable consumer

behavior [52]. They strive to minimize harm to the environment while fulfilling their needs and are aware of the scarcity of resources. However, this mindset is not developed in isolation, as certain factors such as marketing persuasion and online forums contribute to the formation of these attitudes.

To increase the number of green consumers, it is important to promote green thinking through various promotional techniques, with online forums and social media being particularly effective [18]. Consumers require adequate information on green energy products that meet their needs to make informed environmentally friendly purchases.

It is noted that a lack of information may prevent consumers from making their purchasing decisions toward green consumption [87]. The theory of planned behavior posits that the behavioral control is influenced by the environmental services providers and can lead to development of green purchase intentions and actual behavior. In light of the arguments provided above the hypotheses developed is given below,

H1 Online Environmental Platforms Service(s) has a positive impact on green purchase behavior among Pakistani green energy consumers.

Environmental attitude as a mediator

The attitude formation depends upon several factors. The depleting energy sources on one side and the cost of availing the traditional energy sources, on the other, motivate consumers to look for the alternatives (green energy sources) available [51]. The positive attitudes lead to the actual green behaviors [1]. The people with higher environmental concerns have greater tendency to adopt the same behavior [73]. However, there an evidence that it is not necessary that the consumers positive attitudes toward environmental issues lead to actual purchase behavior [42]. The attitude formation depends upon the information coming from different forums such as online forums. As knowledge sharing has seen to have positive relationship with attitude formation [21]. The information received, the positive reviews and the information about the prices tend to develop attitude toward buying such products.

The online forums have resulted in exponential growth in the development of purchase attitudes of customers in recent years [48], making online shopping the most common modes of consumption. During online shopping, consumers cannot contact real goods and can only make purchase decisions through the product information displayed online [46]. This is because of the convenience that these forums provide to the customers and help them make decisions without wasting time.

The producers of the green energy products and the Online Environmental Platforms Service providers collectively promote videos that have become the most loved part of the online shopping for the customers [3]. Brown and Fiorella [9] conducted a study regarding influence marketing and analyzed how to enhance the impact through Instagram, TikTok, and Co. TikTok improved user satisfaction and forms enable users to participate in such forums to make viable purchase decisions.

Online comments [15], online reviews [78], and electronic word of mouth [8] are simultaneously used to describe the content that consumers express through their subjective feelings about buying and selling of goods or services by using a specific online shopping platform. The environmental service platforms are similar to these platforms. Most of the people provide interesting online reviews that comprise of the comments on products or services. Such comments include post-purchase experiences, personal thoughts about the improvements, or feelings presented in a written form. The e-commerce has provoked the influence of online reviews on consumer purchase decision making [37]. Atchariyakarn and Zhang [6] believed that the purchase decisions without enough information can lead to decreased sales of the companies that is why it is recommended to get to the online forums to disseminate information for developing customer purchase attitude, to increase sales and enhanced customer satisfaction [45]. Therefore, the availability of the expert opinion and the online comments/reviews of the people who already have purchased the green energy products are very important for other consumers.

Further, in this regard, the online forums that provide information and advice about the purchase play important role. The online platforms provide information about not only the availability of the product rather its location, uses, benefits, and user reviews [35] that help the customers develop positive purchase attitudes. The rating by the other users supports the development of purchase attitude that further leads to purchase behavior.

The online can influence customer perceptions [42] and continuously motivate people to follow their opinion leaders [13], Moreover, OEPS is useful to address barriers to green purchase behavior by providing information, resources, and support [22]. Therefore, environmental attitudes can mediate the relationship between OEPS and GPB by influencing individuals' perceptions of the effectiveness and convenience of OEPS in facilitating green purchases, thereby reducing barriers and facilitating behavior change. The above arguments helped in the development of the following hypotheses,

H2 OEPS has a positive effect on the development of environmental attitude.

H5 Environmental attitude has a positive effect on green purchase behavior

H8 Environmental attitude mediates the relationship between Online Environmental Platforms Service and Green Purchase Behavior

Price sensitivity as a mediator

The price sensitivity is the change in purchase behavior of customers with the change in the prices of the products [86]. The people with high price sensitivity effects their behavior in a way that a slight price change can substantially affect their purchase behavior [34]. The customers generally perceive that the products with higher prices are good in quality and vice versa. Low product quality is associated with low price [28]. The information available at the environmental forums can influence one's price sensitivity, and thus, the purchase behavior is affected.

The complexity of consumer environmental behavior pertains to financial inability, such as a lack of affordable green products available in the market [87]. It is noted that people are reluctant to pay a penny more for any additional benefit they get in a product [50]. The consumers generally prefer to buy non-ecological products to fulfill their needs to avoid higher prices of the ecological goods. However, this relationship is not clear in its explanation. Some consumers are willing to pay more for organic products because they are of better quality [16]. However, it is evident that in the developing countries the lower prices can attract customers more than any other feature of the product. It is posed that the lower prices of the green energy products can attract customer attention more and they likely can adopt the purchase behavior.

In this regard, the theory of planned behavior posits that the information flowing from the environmental forums gets hold of one's control of thinking processes, and thus, the behavior adopted is influenced by such information by developing a price sensitivity.

The online forums influence consumers' perception of the value they receive from eco-friendly products [39]. Similarly, the cost-saving opportunities can enhance the perceived value of green purchases. This, in turn, reduces price sensitivity as consumers perceive that the benefits of purchasing green products outweigh the costs. OEPS also facilitates price comparisons and provides transparent information about the pricing of eco-friendly products. By presenting competitive pricing or offering discounts and promotions, OEPS can alleviate price sensitivity and encourage consumers to make green purchases. The following hypotheses are developed on the basis of the arguments stated above;

H3 OEPS has a positive effect on the price sensitivity.

H6 Price sensitivity has a positive effect on green purchase behavior

H9 Price sensitivity mediates the relationship between Online Environmental Platforms Service and green purchase behavior

Consumer impulsiveness as a mediator

Rook [57] looked impulse buying as an instantaneous, overwhelming, and continuous purchase desire experienced by consumers without purchase plan and purchase consciousness. Beatty and Ferrell [7] understood this as an immediate purchase without any shopping goal, whether it is to buy a specific product category or meet a specific demand. Impulsive purchase occurs as a result of sudden factors acting at that point in time. Impulse buying behavior or impulsiveness in this paper refers to the purchase behavior of green energy products without any plan when consumers use mobile short video applications to watch live broadcast, stimulated by online comments, hosts, and other factors. Impulse buying is a very important factor in marketing. Nayak et al. [47] studied the influence of available pursuit on purchase decision and impulse purchase and analyzed Amazon shopping experience. The results showed that any hidden need leads to make impulse purchase decision, and thus, the customer adopts the purchase behavior. Wiranata and Hananto [80] believed that online shopping leads to irrational behaviors such as impulse buying and analyzed the influencing factors of impulse buying and it explores the impact of website quality on impulse buying. The results showed that website quality has no positive impact on impulse buying, whereas the promotional messages and consciousness had a positive impact on impulse buying. Chen, Yeh and Lee [14] investigated the impact of Internet celebrities/experts on brand impulse purchase. Through the survey of 585 Internet celebrity fans in China, they found that trust is an important factor affecting impulse buying. The sense of identity and perceived fit, that can come from the advises and opinions available on the online environmental forums, significantly promote impulsiveness leading to actual purchases. OEPS provides an opportunity to make impulsive decisions. The convenience, accessibility, and attractive presentation of eco-friendly products and promotions on OEPS can trigger impulsive buying tendencies among consumers [36]. CI mediates this relationship by influencing

consumers' susceptibility to impulsive buying behaviors in the context of green products and services. The visually appealing presentation of eco-friendly products, gamification elements, and personalized recommendations on OEPS can stimulate consumers' impulsive desire for immediate satisfaction and enjoyment [48]. CI mediates this relationship by influencing the extent to which consumers are driven by the pleasurable and emotional aspects of green products, leading to impulsive green consumer behavior. The above arguments are used to develop the following hypotheses,

H4 OEPS has a positive effect on the consumer impulsiveness.

H7 Customer impulsiveness has a positive effect on green purchase behavior

H10 Consumer impulsiveness mediates the relationship between Online Environmental Platforms Service and green purchase behavior.

Figure 1 shows the relationship of the proposed hypothesis.

Methodology

The respondents were selected from two major cities of Pakistan named as Rawalpindi and Islamabad. Rawalpindi and Islamabad have been selected as target cities because these cities are highly urbanized with a significant population, representing diverse socioeconomic backgrounds and consumer behaviors. Moreover, these cities have a growing internet penetration rate, making online platforms accessible to a large portion of the population, thereby facilitating the examination of the role of online environmental platforms on green consumer behavior. Further, these cities offer a blend of urban and suburban settings, allowing for a comprehensive understanding of the research objectives in different environmental contexts. Islamabad is the capital of Pakistan and both these cities are known as a hub of education and employment. Majority of people prefer to reside in these cities to acquire knowledge and work. They generally are better informed with greater environmental consciousness. Straughan and Roberts [68] argued that environmentally sensitive consumers are relatively younger, better educated, have stable incomes and mostly consist of women. For the present examination a sample of 301 customers was selected using purposive sampling. It is a non-random selection of participants to target a specific group of individuals who possess characteristics or experiences relevant to the study [19]. In our research study, we were interested to examine the relationships based on the responses form the customers who have made at least one purchase of a green product. Their responses were recorded using closed-ended questionnaire. According to Ruangkanjanases et al. [58], the most appropriate sample range lies from 30 to 500. The sample size of 301 was determined based on considerations such as available resources, time constraints, and the anticipated effect size. Although the sample size may not represent the entire population of Pakistan, it allows for a reasonable level of statistical power and precision in analyzing the relationship. The sample comprised of the people in the 30–50 years of age group. This age group represents individuals in their prime years of decision-making and

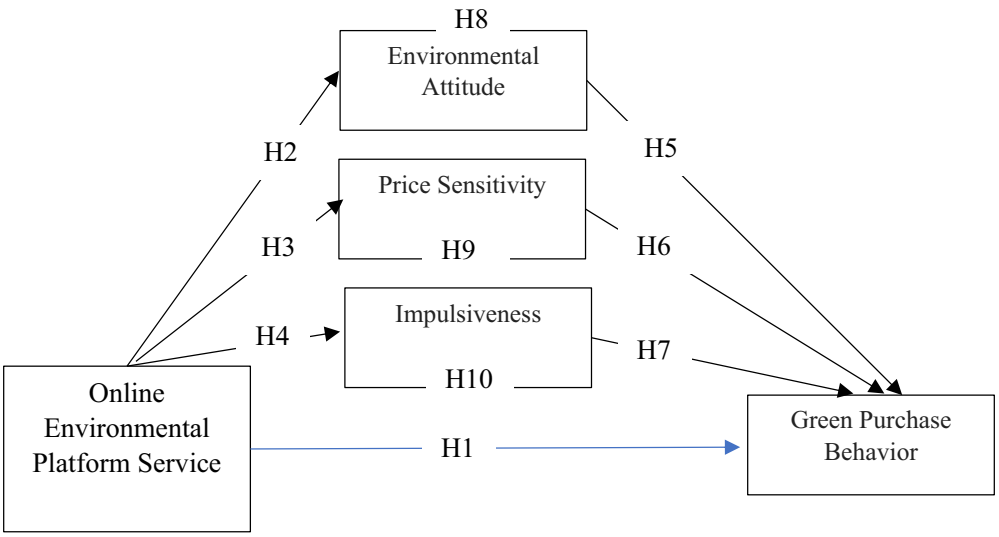

Fig. 1 Research framework

purchasing power, making their behaviors and attitudes toward green consumerism particularly relevant. Individuals in this age range often have higher levels of environmental consciousness and are more likely to engage in sustainable practices, making them an appropriate target for studying the relationship between online environmental platforms and green consumer behavior. Women employees, graduates, and male employees were considered for the study as they can make their independent purchase decisions while considering the environmental protection into account. The sample was selected to cover the different socio-economic and different demographic characteristics. Further, only the customers who used to buy or at-least they have bought once any green energy product using online sources were included for data analysis. The data were gathered during the four months of summer (May–August, 2022).

The measures used

The data were collected by self-administered questionnaires. The questionnaire was adopted from previous studies for each variable. Online environmental platform service was measured using Ma, and Liu [42] scale and included six items. The sample item includes "The online environmental platform has complete functions to meet my green environmental needs." Green consumer behavior was also assessed using the scale from Ma, and Liu [42] using four items. Environmental attitude was measured from two aspects that were the sensitivity of environmental problems and the importance of environmental protection. Six items were used to measure the construct. The sample item included was "waste of resources and environmental pollution are serious environmental problems." The questionnaire was adopted from [17]. Further, the price sensitivity was based on two dimensions price importance and price search propensity. There were four items in total. The items were adopted from Sinha and Batra [67]. Lastly, consumer impulsiveness was measured using five items. The scale was adopted from Verhagen, and Van Dolen [76]. The items were measured on five points Likert scale. A sample item used was, "my purchase was spontaneous."

The statistical tests used

Structural equation modeling (SEM) using Smart PLS 3.0 was employed to examine the hypothesized relationships. SEM as a robust statistical technique allows for testing complex relationships and assessing the direct and indirect effects of variables and it has suitability for small sample sizes (Yuan, & Bentler, 2006).

Common method variance

The procedural remedies were adopted while collecting the data from the respondents to minimize potential common method biases. Respondents' anonymity was ensured using a randomized response order for questionnaire items. Moreover, clear instructions to encourage honest responses were employed. This helped in avoiding the common method bias.

Results

Demographics information of the customers

The demographics information about the total number of respondents, gender distribution, employment sector represented, age, education, and employment is provided in Table 1.

More than half of the green energy consumers represented the age group between 41 and 50 years (69.4%) and were having Masters qualification (66.1%). Majority of the consumers were earning more than 200,000 Pakistani Rupees (37.2%), that is, around 902 USD a month. Majority of the consumers were male (66.7%) and all the consumers were employed. Either they had their own business or were doing job in some organization. They used the internet for searching information and products for more than five hours a day. All the respondents regularly used the online forums for seeking advice and read the reviews of other users. Moreover, the consumers represented healthy combination of employment sectors such as education (23.9%), information technology (20.9%), manufacturing (11.6%), healthcare (7.6%), agriculture (10.9%) and construction (24.9%). The customers were interested to seek information using online forums about solar panels (29.5%) followed by energy saving air-conditioners (23.9%) and energy saving LED bulbs (21.5%).

The measurement model

The measurement model includes the information about the factor loadings, reliability and average variance extracted (AVE). The reliability was used examine the internal consistency, and AVE was used to assess the convergent validity [24]. The details are provided in Table 2.

The reliability and validity were tested to satisfy the requirements of the measurement model [24]. Cronbach's alpha values more than 0.7 are acceptable. Convergent validity of the items was examined through factor loadings and average variance extracted measures. All the factors loadings were above the threshold value of 0.7, while AVE values were above the recommended threshold level of 0.5 [24]. The values of the measurement model satisfactorily allowed to further examine the

Table 1 Demographics information of customers. *Source*: Customer's responses, $n = 301$

Variables	Category	Frequency	Percentage
Age (Years)	31–40	66	21.9
	41–50	209	69.4
	Above 50	26	8.6
Education	Bachelors	79	26.2
	Masters	199	66.1
	Above Masters	23	7.6
Income (PKR)	51,000–100,000	33	10.9
	101,000–150,000	57	18.9
	151,000–200,000	99	32.8
	Above 200,000	112	37.2
Employment	Yes	301	100
Daily use of internet	1–3 h	44	14.6
	3–5 h	67	22.2
	Above 5 h	190	63.1
Use of online forums	Yes	301	100
Gender	Male	201	66.7
	Female	100	33.2
Employment sector	Education	72	23.9
	Information Technology	63	20.9
	Manufacturing	35	11.6
	Healthcare	23	7.64
	Agriculture	33	10.9
	Construction	75	24.9
Products	Energy-saving refrigerator	32	10.6
	Energy-saving Washer	43	14.2
	Energy-saving Air-conditioner72	23.9	
	Energy-saving LED light bulb65	21.5	
	Solar panel	89	29.5
Total participants		301	100

structural model. The Cronbach's alpha and AVE values for Online Environmental Platform Service were 0.821, 0.536, respectively. Similarly, the values for green purchase behavior were 0.734, 0.556, environmental attitude 0.812, 0.516; Consumer impulsiveness 0.919, 0.756 and price sensitivity 0.816, 0.645.

The structural model

Further, to examine the distinctive nature of the constructs the HTMT ratio was calculated. It is the mean value of the item correlations across constructs relative to the (geometric) mean of the average correlations for the items measuring the same construct [27]. Table 3 indicates that all the values are far lower to a traditional benchmark of 0.85 [27], and hence, model's constructs are distinctive from one another.

Table 3 shows the results of the discriminant validity and the values reported in the diagonal with bold fonts are the square root of the AVE values. For discriminant validity it is necessary that the values in diagonal must be greater than the other values reported under these values. This shows that there exists enough discriminant validity that allows further examination of the developed framework.

Further, the relationships are shown in Fig. 2. The results how a positive and significant impact of Online Environmental Platforms Service (beta = 0.235, $p = 0.001$). Further the Online Environmental Platforms Service, positively and significantly effects the environmental attitude (beta = 0.347, $p = 0.000$), consumer price sensitivity (beta = 0.341, $p = 0.000$), and consumer impulsiveness (beta = 0.490, $p = 0.000$). Moreover, the environmental attitude (beta = 0.683, $p = 0.000$) and consumer impulsiveness (beta = 0.104, $p = 0.046$) positively affected the green consumer behavior, whereas price sensitivity (beta = − 0.248, $p = 0.037$) negatively

Table 2 Loadings, reliability and AVE and VIF. *Source*: PLS-Measurement model results

Constructs/Items	Factor loadings	Reliability	AVE	VIF
Environmental attitude		0.812	0.516	1.523
EA1	0.741			
EA2	0.700			
EA3	0.708			
EA4	0.785			
EA5	0.725			
EA6	0.644			
Green purchase behavior		0.734	0.556	2.356
GPB1	0.748			
GPB2	0.802			
GPB3	0.718			
GPB4	0.711			
Consumer impulsiveness		0.919	0.756	2.655
CI1	0.893			
CI2	0.898			
CI3	0.858			
CI4	0.825			
CI5	0.872			
Online environmental Platform service		0.821	0.536	1.987
OEPS1	0.760			
OEPS2	0.766			
OEPS3	0.717			
OEPS4	0.834			
OEPS5	0.756			
OEPS6	0.512			
Price sensitivity		0.816	0.645	
PS1	0.817			
PS2	0.790			
PS3	0.773			
PS4	0.831			

Table 3 Heterotrait–Monotrait ratio. *Source*: Smart PLS Output

Constructs	EA	GPB	CI	OEPS	PS
Env. attitude	0.617				
Green PB	0.392	0.271			
Impulsiveness	0.340	0.479	0.704		
Online EPS	0.347	0.638	0.490	0.722	
Price sensitivity	0.615	0.488	0.294	0.341	

OEPS Online Environmental Platforms Service, *GPB* Green purchase behavior, *EA* Environmental attitude, *PS* Price sensitivity, *CI* Consumer impulsiveness

and significantly affected the green consumer behavior in terms of purchasing the green energy products. The mediation analysis shows that the environmental attitude (beta = 0.237, $p = 0.000$) and consumer impulsiveness (beta = 0.051, $p = 0.047$) mediate the relationship between OEPS and GPB, whereas the price sensitivity remained negative to the relationship.

The effect of environmental attitude partially mediates the basic relation between OEPS and GPB. While there is a significant direct effect of Online Environmental Platforms Service on green purchase behavior, the introduction of price sensitivity as a mediator did not yield a significant mediation effect. However, the total effect still suggests a positive relationship between the two, but additional research may be required to validate this relationship further.

Moreover, the relationship of OEPS and GPB is partially mediated by consumer impulsiveness. The total effect indicates that the combined influence of both the direct effect and mediation effect is highly significant. This suggests that there may be other factors beyond consumer impulsiveness that also contribute to the relationship between Online Environmental Platforms Service and green purchase behavior.

Further, the coefficient of determination was examined through *R*-square to evaluate the predictive power of the variables. The value of R^2 for the OEPS (0.413). The values for R^2 for the environmental attitude (0.325), price sensitivity (0.452), and consumer impulsiveness (0.411) can also be found in Table 4.

Indicator multicollinearity through VIF

Utilizing the variance inflation factor (VIF) measurement the indicators' multicollinearity was assessed. Hair et al. [24] suggested that multicollinearity does not remain a significant problem if the VIF value is less than 5. However, values close to 3 are recommended. The VIF scores for the indicators are indicated in Table 2 showing an acceptable range of values. Full collinearity test was done on the recommendations of Kock [33]. The values of variance inflation factor (VIF) ranged within 1.5 to 2.6, Table 2. The values were below the threshold value of 3, recommended by [24]. It also shows weak CMV.

The effect size (f^2)

The effect size is examined using *f*-square. The effect size (*f*2) scores for the current study adhered to Cohen's (1988) suggestions "(effect sizes: small = 0.02, medium = 0.15, and large = 0.35)." The results revealed the effect sizes for various variables, shown in Table 4, i.e., f2 values for OEPS = 0.067, EA = 0.125, CI = 0.013, and PS = 0.017 which varied from small to medium effect sizes.

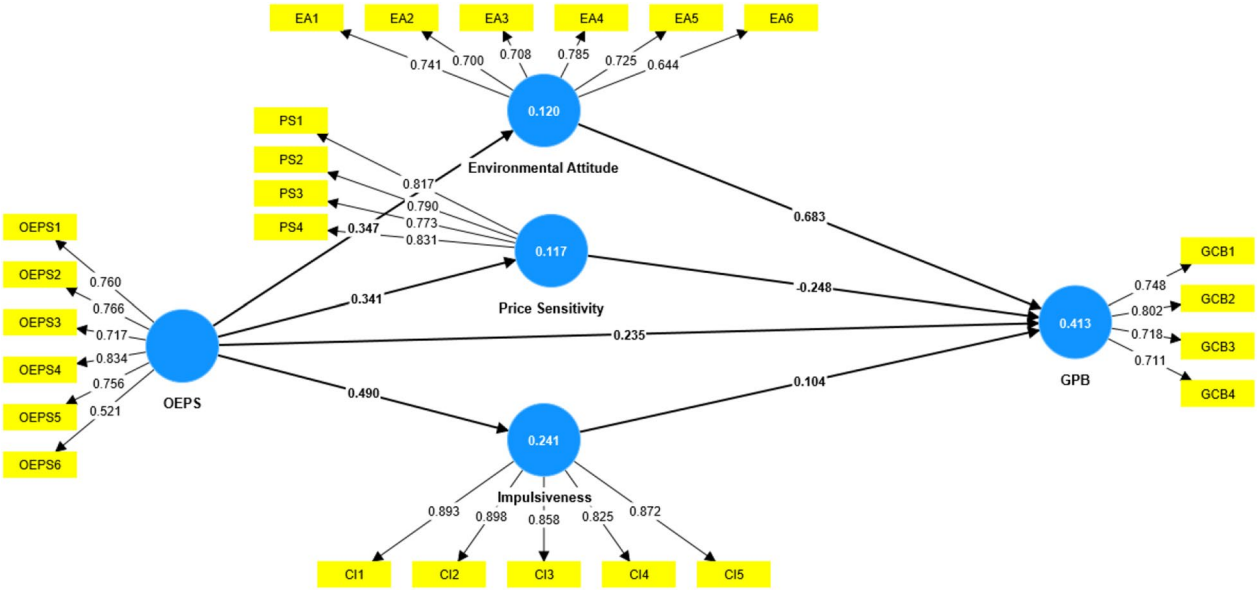

Fig. 2 Tested model

Table 4 Path Coefficients Direct Effects. *Source*: PLS-SEM Results

Relationship	Coefficient	Bias-corrected CI 95%	*p* value	Hypothesis/Result
OEPS– > GPB	0.235	[0.304:0.548]	0.001	H1/Accept
OEPS– > EA	0.347	[0.246:0.404]	0.000	H2/Accept
OEPS– > PS	0.341	[0.232:0.332]	0.000	H3/Accept
OEPS– > CI	0.490	[0.241:0.311]	0.000	H4/Accept
EA– > GPB	0.683	[0.311:0.421]	0.000	H5/Accept
PS– > GPB	-0.248	[0.441:0.311]	0.037	H6/Accept
CI– > GPB	0.104	[0.341:0.431]	0.036	H7/Accept
R^2 OEPS	0.413			
R^2 EA	0.325			
R^2 PS	0.452			
R^2 CI	0.411			
Q^2 GPB	0.410			
f^2 GPB	OEPS = 0.067	EA = 0.125	CI = 0.013	PS = 0.017

OEPS Online Environmental Platforms Service, *GPB* Green purchase behavior, *EA* Environmental attitude, *PS* Price sensitivity, *CI* Consumer impulsiveness

Predictive relevance using Q^2

The Q square is used to measure the predictive relevance of the model. The value of *Q* square greater than 0 is desired [24]. The blindfolding procedure was used to examine the predictive relevance and the results found a value of 0.410 for the green purchase behavior that shows adequate predictive relevance, see Table 4.

Discussion

The study examined the relationship between Online Environmental Platforms Service and green purchase behavior with the mediating roles of environmental attitude, price sensitivity, and impulsiveness. Online Environmental Platforms Service has become increasingly popular in Pakistan, allowing consumers to access information and resources that promote environmentally conscious decision-making [1, 4, 43, 89]. The present study examined the impact of Online Environmental Platforms Service(s) on green purchase behavior (hypothesis 1), as well as a few indirect relationships, and found that OEPS had a positive effect on GPB. Online environmental platforms provide extensive information about green products and serve as a valuable source for making environmentally friendly purchases [89]. As

traditional energy sources continue to deplete, there is a growing need to explore alternative energy sources, such as solar energy [1, 59, 62]. Online forums are beneficial in shaping consumer attitudes, leading to positive decision-making [43]. While individuals may initially join these forums for personal fulfillment, they often receive persuasive messages that encourage them to make actual purchases [35]. The findings of the current study support findings of Sarah et al. [63], who argued that online environmental platforms have a significant positive impact on green consumer behavior in Pakistan. People who regularly use online platforms to learn about environmental issues are more likely to make environmentally friendly choices, such as purchasing eco-friendly products and reducing their energy consumption [1, 89] (Table 5).

At times, people join such forums for their own need fulfillment, but as they get persuasions about the environmental protection, they adopt actual green purchase decisions [35]. The persuasion they get pertain to the information related to the environmental problems and their possible solutions, others' purchase decisions, customers' reviews and feedback. All these helps develop attitude toward green energy purchases [18]. The developed attitude further leads them to adopt the actual green behavior. Besides a developing country the studies have categorized Pakistan as a collectivist country [4]. The people generally do not like to buy products unless they consult their opinion leaders.

There exist contradictory results in literature regarding the relationship between OEPS and GCB. Few studies found a positive relationship, indicating that online platforms promoting environmental practices lead to increased green consumer behavior [65]. However, few others presented contradictory findings, highlighting factors such as perceived credibility and trustworthiness of online platforms that may hinder the influence on GCB [35]. Therefore, it is a food for thought that underlying mechanisms may differ in different contexts.

Consumers with a positive attitude toward green products also have higher green purchase intention, which reinforces previous findings [58]. The people try their best to gather as much information as they can before making any purchase decision for which the online environmental platforms are the effective source to build their attitude and effect their consumption patterns (Zhuang, et al., 2021). The results are in line with the earlier studies [38] that show online platforms as an effective means of building consumer attitudes and behaviors. The information in the online forums assist them to find the relevant product at the relevant avenue available, its price information, variety and so forth. Contradictory results have been observed in the literature regarding the relationship between green consumer attitudes and green consumer behavior (GCB). Some studies suggested a positive association, indicating that favorable attitudes toward environmentally friendly products and practices are likely to drive green consumer behavior [35, 75]. However, other studies present conflicting findings, suggesting that the relationship between attitudes and behavior may be weak because of the attitudes being influenced by other factors like situational constraints [31]. Moreover, the literature has seen the environmentally conscious customers tend to have lower price sensitivity. Protecting environment is their priority while making a green purchase.

The study also examined the impact of OEPS on the price sensitivity of consumers (Hypothesis 2). It was noted that the OEPS has a positive impact on price sensitivity. But at the same time the price sensitivity has a negative impact on GPB. It has been established in this study that consumers are willing to buy green products although this will somehow does not translate into actual purchases. It shows the OEPS promotes price sensitivity that restricts them to make purchases (Zhuang, et al., 2021; [28] from online shops. They get aware of the prices and alternate places where the product is available, and they try to avoid purchasing through online means. There exists another phenomenon of deficient trust in while purchasing online [37]. That is why the customers get the information from such online forums and buy the products by physically visiting the markets. This is the reason that the results of the study are showing a positive impact of OEPS with PS and negative impact of PS on GPB. The finding that is the OEPS is a healthy source of influencing consumers' price sensitivity is supported by the earlier studies [76] and consumers avoid making online purchase decisions. The inconsistencies in the literature show mixed findings on the relationship between price sensitivity and consumer green purchases. Few studies suggested that price sensitivity negatively influences GCB, indicating that consumers prioritize lower prices over environmentally friendly products [12]. However, others presented conflicting findings, indicating that price sensitivity does not necessarily impede GCB, and consumers are willing to pay a premium for sustainable

Table 5 Mediation. *Source* PLS-SEM Results

Indirect effect			Total effect	
	Coefficient	*p* value	Coefficient	*P* value
OEPS – > EA – > GPB	0.237	0.012	0.472	0.000
OEPS – > PS – > GPB	– 0.085	0.081	0.150	0.071
OEPS – > CI – > GPB	0.051	0.047	0.286	0.001

OEPS Online Environmental Platforms Service, *GPB* Green purchase behavior, *EA* Environmental attitude, *PS* Price sensitivity, *CI* Consumer impulsiveness

products [66]. These contradictory findings highlight the complexity of the relationship and for sustainability, the companies must understand the mechanisms underlying the interplay between price sensitivity and GCB. This study found a negative relationship between price sensitivity and green behaviors. When consumers prioritize lower prices and cost savings, they may be less inclined to consider the environmental impact of their purchase decisions.

Online forums add to the impulsiveness of the consumers [41, 76]. The attractive comments, pictures and the videos available enhance their attitude and influence them to adopt impulsive behaviors [48]. The availability of the information in colorful texts and the attractive formats trigger consumers' switching behaviors they make impulsive decisions [70]. Inconsistencies exist in the literature for the relationship between impulsiveness and Green Consumer Behavior (GCB). Few researchers saw higher levels of impulsiveness lead to reduced engagement in green behaviors due to a focus on immediate gratification rather than long-term environmental concerns [49]. However, others presented conflicting findings, indicating that impulsiveness can drive positive green purchase behavior by prompting spontaneous decisions aligned with personal values and environmental consciousness [13, 53].

The results of the study are partially supported by the theory of planned behavior. Although it is clear that the OEPS does influence the green energy purchase attitudes of consumers and their impulsiveness but the price sensitivity is not much effected rather it is negatively affected by the OEPS. The strength of need and the difficulty to acquire other energy alternatives lead them to buy the energy products at higher prices even.

Additionally, this study examined the role of environmental attitude as a mediator (Hypothesis 8). Research has shown that online environmental platforms can positively influence green consumer behavior, but the relationship between the two is significantly mediated by the individual's environmental attitude. In other words, a positive attitude toward the environment can lead to a greater likelihood of engaging in green consumer behavior through the use of online environmental platforms [53]. One study found that the use of online environmental platforms, such as eco-friendly shopping apps, led to a significant increase in green consumer behavior among individuals with a strong environmental attitude [78]. Another study found that individuals with a positive environmental attitude were more likely to engage in pro-environmental behavior after interacting with online environmental platforms, compared to those with a less positive attitude [82].

Further, the price sensitivity (Hypothesis 9) was examined a mediator. Price sensitivity plays a significant role in the relationship between online environmental platform services and green consumer behavior. According to research, consumers who are price-sensitive are more likely to be motivated by discounts and other cost-saving incentives when it comes to making environmental-friendly purchases [81]. Online environmental platforms, such as e-commerce sites, offer various environmental-friendly products and services. However, the cost of these products may be higher than their non-environmental-friendly counterparts. Therefore, consumers who are price-sensitive may hesitate to purchase such products, even if they have an interest in being environmental-conscious [81]. This is where the importance of pricing strategies comes into play. Research has shown that providing discounts and other cost-saving incentives can motivate price-sensitive consumers to make environmental-friendly purchases [56].

Lastly, the impulsiveness (Hypothesis 10) was examined as a mediator. Research suggests that impulsiveness plays a significant role in mediating the relationship between online environmental platforms and green consumer behavior. Firstly, online environmental platforms offer consumers easy access to information about sustainable products and practices, which can lead to increased awareness and interest in environmental issues. However, this information overload can also lead to decision fatigue and impulsive purchases [60]. Secondly, online shopping offers consumers the convenience of making purchases without leaving their homes. This convenience can lead to impulsive buying behaviors, especially when coupled with the immediate gratification of online shopping [14]. Finally, consumers who engage with online environmental platforms may experience social pressure to conform to environmentally friendly behaviors. This social pressure can lead to impulsive purchases in order to signal one's environmental values to others [39].

The theory of planned behavior (TPB) is a widely used framework in the study of consumer behavior and its relationship to environmental concerns. TPB suggests that individual attitudes, subjective norms, and perceived behavioral control are the primary determinants of an individual's intentions to engage in a particular behavior, which in turn affects their actual behavior [2]. Studies have shown that online environmental platforms can have a positive impact on green purchase behavior of customers, consumer green purchase attitude, price sensitivity and consumer impulsiveness [53, 83]. This finding

supports the TPB, as online environmental platforms can influence an individual's attitudes and perceived behavioral control toward green consumption. By providing information and resources related to environmentally friendly products and services, online environmental platforms can increase an individual's knowledge and awareness of the impact of their consumption behavior on the environment, leading to a more positive attitude toward green consumption.

However, the price sensitivity has a negative impact on actual green purchase behavior [53, 70]. This finding suggests that although an individual may have a positive attitude toward green consumption, their actual behavior may be limited by the price of environmentally friendly products. This finding is consistent with TPB, as perceived behavioral control can be affected by external factors such as cost. Furthermore, studies have shown that consumer attitude and impulsiveness contributed positively toward green consumer behavior, and that green consumer attitude and consumer impulsiveness mediated the relationship between online environmental platforms and green consumer behavior [70, 83]. This finding supports TPB, as attitudes and impulsiveness are two components of the model that can influence an individual's intention to engage in a particular behavior.

The research identified the factors that enhance consumers' inclination to buy green energy products. The online environmental platforms serve as a valuable tool in fostering green energy attitudes, price sensitivity, and impulsive buying behavior among consumers. However, when consumers become more cost-conscious, they tend to avoid making online purchase decisions. Furthermore, consumer attitudes and impulsivity have a direct and indirect impact on their green consumption behavior.

Conclusion

The study findings are based on important insights into the relationship between Online Environmental Platforms Service and green purchase behavior. The positive relationship between these variables suggests that online platforms play a significant role in influencing customers' green purchase behavior. Furthermore, the mediating effects of environmental attitude indicate that customers' positive attitudes toward the environment play a crucial role in driving their green purchase intentions through online platforms. Conversely, the negative mediation of price sensitivity implies that customers' sensitivity to prices may hinder their willingness to engage in green purchases. However, the positive mediation of consumer impulsiveness highlights the potential for impulsive customers to be positively influenced by online environmental platforms in adopting green purchase behavior. These findings provide valuable insights for businesses and policymakers to design effective strategies that leverage the power of online platforms to encourage sustainable consumer choices.

Theoretical implications

The results indicate a positive relationship between OEPS and GPB align with the theory of planned behavior, which suggests that attitudes and subjective norms influence behavioral intentions and subsequently affect actual behavior. The findings also support the mediating role of environmental attitude, indicating that customers' positive environmental attitudes contribute to their adoption of green purchase behavior. On the other hand, the negative mediation of price sensitivity suggests that customers' sensitivity to prices may hinder their green purchase behavior. The positive mediation of consumer impulsiveness suggests that impulsive customers are more likely to engage in green purchase behavior through online environmental platforms. These theoretical implications highlight the importance of addressing environmental attitudes, price concerns, and impulsive tendencies when designing interventions and strategies to promote green purchase behavior.

The theory of planned behavior considers three main factors such as attitude, subjective norm, and perceived behavioral control to predict behavioral intention. In this study, we have introduced the concept of multiple mediators that serve as intermediary variables to explain how and why online environmental platforms influence green consumer behavior. This addition of mediators provides a comprehensive understanding of the underlying mechanisms at play.

Moreover, the TPB focuses on individual beliefs and perceptions to shape up behavioral intentions. The current framework extends the TPB by specifically examining the role of online environmental platforms that helps develop individual' beliefs and perceptions about green purchases. It acknowledges the impact of external factors and technological platforms in influencing individual intentions and behavior.

Practical implications

Although the customers and green manufacturers go hand in hand can benefit from these implications, however, the data were collected from the customers and the implications focus on promoting green purchase behavior among customers,

Online environmental platforms provide customers with valuable information about sustainable products, practices, and services. Customers benefit from accessing reliable and up-to-date information about environment friendly options, enabling them to make informed purchasing decisions and adopt green consumer behavior.

These platforms facilitate collective action by providing customers with opportunities to participate in environmental initiatives, join green communities, and share their experiences and knowledge. Engaging in collective efforts through these platforms can strengthen customers' commitment to green behaviors.

Online environmental platforms play a crucial role in educating and raising awareness about environmental issues among customers. By providing informative content, articles, and resources on the platform, companies can help shape and reinforce positive environmental attitudes among customers, thereby increasing the likelihood of green consumer behavior. Online platforms allow people to share personalized recommendations that shape customers' environmental attitudes. By tailoring the platform experience to individual preferences and values, companies can create a sense of resonance and relevance, increasing customer engagement and encouraging them to make environmentally conscious choices. Building a sense of community and fostering social support within online environmental platforms can strengthen customers' environmental attitudes and encourage green consumer behavior. Companies can facilitate discussions, provide forums for sharing experiences and knowledge, and connect customers with like-minded individuals to create a supportive network that reinforces positive environmental attitudes and encourages sustainable actions.

Price sensitivity as a mediator suggests that customers who are price-sensitive may be more likely to engage in green consumer behavior when they perceive online environmental platform services as offering affordable and cost-saving options. Companies can leverage this by highlighting the cost-effectiveness of eco-friendly products and services, emphasizing long-term savings and benefits, to encourage price-sensitive customers to adopt green behaviors. Companies can emphasize the value proposition of green products and services through online environmental platforms to address price sensitivity. By showcasing the environmental benefits, durability, and superior quality of sustainable options, customers can perceive them as valuable investments, reducing concerns about price and justifying the higher upfront costs associated with eco-friendly alternatives. Online environmental platforms can encourage companies to offer competitive pricing strategies for green products and services. By leveraging economies of scale, streamlining operations, and optimizing supply chains, companies can reduce costs and pass on the savings to customers. This approach can help mitigate price sensitivity and make green options more accessible and attractive to a wider customer base.

Consumer impulsiveness as a mediator suggests that customers who are more impulsive may benefit from strategies that promote self-control and reflection before making purchasing decisions on online environmental platforms. Companies can provide tools and prompts on the platforms that encourage customers to pause and consider the environmental implications of their choices, fostering mindful decision-making and reducing impulsive purchases. Online environmental platforms can leverage gamification techniques and rewards systems to engage impulsive customers in green consumer behavior. By incorporating elements such as challenges, achievements, and incentives, companies can encourage impulsive customers to actively participate in sustainable actions, making the process enjoyable and rewarding, while positively influencing their green consumer behavior. Online platforms can employ subtle nudges to guide impulsive customers toward green choices. This can include highlighting eco-friendly options, providing environmental impact ratings or certifications, and showcasing positive social proof and testimonials to influence impulsive decision-making in favor of sustainable products and services.

Limitations and future directions

This research study has few limitations. A limited data set of 301 customers was used. Future research should employ a more diverse and representative sample and sampling method to enhance the generalizability of the findings. Moreover, combining quantitative data from closed-ended questionnaires with qualitative methods could provide a more comprehensive understanding of consumers' green purchase behavior. Future research could explore the influence of contextual factors, such as rate of unemployment, knowledge acquisition methods/sources, culture or socio-economic status, on the relationship between Online Environmental Platforms Service and green purchase behavior [26, 66]. Therefore, incorporating these contextual factors into future research allows for a more holistic understanding of the dynamics influencing green purchase behavior through online environmental platforms. It can inform the development of more effective strategies for promoting sustainability and green consumer behavior in different environments and demographics.

Appendix

See Table 6.

Table 6 Operationalization of the variables. *Source*: Literature reviewed

Variable	Definition	Items	Sources
Online environmental platform service	These provide services through information technology and advocate a culture of public welfare participation, which form a novel environmental protection model with the characteristics of convenience, accessibility, intelligence, efficiency, and transparency	1-The online environmental platform has complete functions to meet my green environmental needs 2: The online environmental platform can provide a carrier for my green environmental protection behaviors 3: The online environmental platform provides me with many interesting functions, special activities and friend interaction, which bring me a lot of happiness 4: The online environmental platform provides me with opportunities for game participation and human–computer interaction, which give me a higher sense of experience 5: The online environmental platform provides such functions as achievement presentation, certificate award and so on, which also help me create a friendly image of the environment 6: The activities and services provided by the online environmental platform have a good social image, which also help my participation win good social recognition	Ma and Liu [42]
Green purchase behavior	It is a pro-environmental behavior, a form of consumption that harms the environment as little as possible or even benefits the environment	1: When the economy permits, I prefer to buy recyclable daily products and clothes with reasonable design and green material selection 2: I would actively purchase organic fruits and vegetables and develop healthy eating habits 3: In daily life, I would actively use energy saving appliances 4: I would actively travel by public transport	Ma and Liu [42]
Environmental attitude	Environmental attitudes (EA), a crucial construct in environmental psychology, are a psychological tendency expressed by evaluating the natural environment with some degree of favor or dis-favor	1: I pay much attention to the problem of environmental pollution and shortage of resources 2: It is necessary for public to save resources and protect the environment 3: Saving resources and protecting the environment are very meaningful for social development 4: People's work and life make the environmental problems worse 5: Waste of resources and environmental pollution are serious environmental problems we are facing 6: If the current situation continues, we will soon face more serious environmental pollution and resource shortage	Dunlap and Liere [17]
Price sensitivity	Price sensitivity is the degree to which the price of a green product affects consumers' purchasing behaviors. It is about how demand changes with the change in the cost of green products	1: Price is the most important consideration when I choose to buy a product 2: I tend to buy the lowest-priced product when my needs are met 3: Before making the purchasing decision, I need to collect a lot of information about the price of the product 4: I think it's worth to spend time and energy to find a low price	Sinha and Batra [67]
Consumer impulsiveness	The personality trait that provokes an immediate purchase willingness with no pre-shopping intentions either to buy the specific product category or to fulfill a specific buying task	1: My purchase was spontaneous 2: My purchase was unplanned 3: I did not intend to do this purchase before this shopping session 4: Before visiting the site, I did not have the intention to do this purchase 5: I could not resist to do this purchase at the site	Verhagen, and Van Dolen [76]

Abbreviations

GPB	Green purchase behavior
OEPS	Online environmental platform service
EA	Environmental attitude
PS	Price sensitivity
CI	Consumer impulsiveness
TPB	Theory of planned behavior
AVE	Average variance extracted
SEM	Structural equation modeling
PLS	Partial Least Square

Acknowledgements
Not applicable.

Author contributions
SR was involved in conceptualization, data curation, writing—original draft, reviewing and editing. FS contributed to resources, methodology, software, formal analysis, data curation, and writing—reviewing and editing. AR contributed to enhance the quality of the manuscript by incorporating the reviewer comments. MIM contributed to resources, supervision and editing. All authors have read and approved the final manuscript.

Funding
The authors of this manuscript, solemnly declare that no funding from any agencies was received for this study.

Availability of data and materials
The authors declare that all types of data used in this study are available for any clarification. The authors of this manuscript are ready for any justification regarding the data set. To make available of the data set used in this study, the seeker must mail to the mentioned email address. The profiles of the respondents are completely confidential.

Declarations

Ethics approval and consent to participate
Not applicable.

Consent for publication
Not applicable.

Competing interests
The authors declare that they have no competing interests.

Received: 29 March 2023 Accepted: 22 November 2023
Published online: 03 January 2024

References

1. Ahmad W, Zhang Q (2020) Green purchase intention: effects of electronic service quality and customer green psychology. J Clean Product 267:122053
2. Ajzen I (1991) The theory of planned behavior. Organ Behav Hum Decis Processes 50(2):179–211
3. Akram U, Junaid M, Zafar AU, Li Z, Fan M (2021) Online purchase intention in Chinese social commerce platforms: being emotional or rational? J Retailing Consum Serv 63:102669
4. Ali A, Khan AA, Ahmed I, Shahzad W (2011). Determinants of Pakistani consumers' green purchase behavior: Some insights from a developing country. Intern J Busi Soc Sci 2(3):217–226. https://www.researchgate.net/profile/Afzaal-Ali/publication/323767231_Determinants_of_muslim_consumers'_Halal_meat_consumption_applying_and_extending_the_theory_of_planned_behavior/links/5aaa7f43aca272d39cd78f6b/Determinantsof- muslim-consumers-Halal-meat-consumption-applying-and-extending-the-theory-of-planned-behavior.pdf
5. Ashfaq M, Tandon A, Zhang Q, Jabeen F, Dhir A (2023) Doing good for society! how purchasing green technology stimulates consumers toward green behavior: a structural equation modeling–artificial neural network approach. Bus Strategy Environ 32(4):1274–1291. https://doi.org/10.1002/bse.3188
6. Atchariyakarn N, Zhang J (2021) A systematic review of perceived value toward online review on s-commerce platform. Int J Res Bus Soc Sci 10(3):46–52
7. Beatty SE, Ferrell ME (1998) Impulse buying: modeling its precursors. J Retailing 74(2):169–191
8. Belhadi A, Kamble S, Benkhati I, Gupta S, Mangla SK (2023) Does strategic management of digital technologies influence electronic word-of-mouth (eWOM) and customer loyalty? Empirical insights from B2B platform economy. J Bus Res 156:113548
9. Brown D, Fiorella S (2013) Influence marketing: how to create, manage, and measure brand influencers in social media marketing. Que Publishing, UK
10. Butt A, Naeem MS, Ali PI, Hameed S (2022) Impact of firms' Greenwashing practices on customer green trust and green brand attachment: Pakistan's home appliances consumers' perspective. Pak Bus Rev 24(1):10–20
11. Carrington MJ, Neville BA, Whitwell GJ (2010) Why ethical consumers don't walk their talk: towards a framework for understanding the gap between the ethical purchase intentions and actual buying behaviour of ethically minded consumers. J Bus Ethics 97(1):139–158. https://doi.org/10.1007/s10551-010-0501-6
12. Carrington MJ, Neville BA, Whitwell GJ (2014) Lost in translation: exploring the ethical consumer intention–behavior gap. J Bus Res 67(1):2759–2767
13. Chai S, Choi B, Kim M, Cheng TCE (2023) Why do people speak about products online? The role of opinion leadership. Inform Technol Manag 24(1):1–17. https://doi.org/10.1007/s10799-022-00359-7
14. Chen TY, Yeh TL, Lee FY (2021) The impact of Internet celebrity characteristics on followers' impulse purchase behavior: the mediation of attachment and parasocial interaction. J Res Interact Mark 15(3):483–501
15. Chen T, Samaranayake P, Cen X, Qi M, Lan YC (2022) The impact of online reviews on consumers' purchasing decisions: evidence from an eye-tracking study. Front Psychol. https://doi.org/10.3389/fpsyg.2022.865702
16. Choi S, Lee S (2020) Eco-packaging and its market performance: UPC-level sales, brand spillover effects, and curvilinearity. Sustainability 12(21):9061–9065
17. Dunlap RE, Van Liere KD (2008) The "new environmental paradigm". J Environ Educ 40(1):19–28. https://doi.org/10.3200/JOEE.40.1.19-28
18. Ebrahimi P, Basirat M, Yousefi A, Nekmahmud M, Gholampour A, Fekete-Farkas M (2022) Social networks marketing and consumer purchase behavior: the combination of SEM and unsupervised machine learning approaches. Big Data Cognit Comput 6(2):35–42
19. Etikan I, Musa SA, Alkassim RS (2016) Comparison of convenience sampling and purposive sampling. Am J Theor Appl Stat 5(1):1–4
20. Gao H, Chen X, Gao H, Yu B (2022) Understanding Chinese consumers' livestreaming impulsive buying: an stimulus-organism-response perspective and the mediating role of emotions and Zhong Yong tendency. Front Psychol 13:881294. https://doi.org/10.3389/fpsyg.2022.881294/full
21. Ghouri AM, Akhtar P, Haq MA, Mani V, Arsenyan G, Meyer M (2021) Real-time information sharing, customer orientation, and the exploration of intra-service industry differences: Malaysia as an emerging market. Technol Forecast Soc Change 167:120–125
22. Gunawardena M, Dhanapala KV (2023) Barriers to removing barriers of online learning. Commun Assoc Inform Syst 52(1):17–27
23. Gupta S, Nawaz N, Alfalah AA, Naveed RT, Muneer S, Ahmad N (2021) The relationship of CSR communication on social media with consumer purchase intention and brand admiration. J Theor Appl Electron Comm Res 16(5):1217–1230
24. Hair JF, Risher JJ, Sarstedt M, Ringle CM (2019) When to use and how to report the results of PLS-SEM. Eur Bus Rev 31(1):2–24. https://doi.org/10.1108/EBR-11-2018-0203/full/html
25. Hamzah MI, Tanwir NS (2021) Do pro-environmental factors lead to purchase intention of hybrid vehicles? The moderating effects of environmental knowledge. J Clean Product 279:123643
26. Han MS, Hampson DP, Wang Y, Wang H (2022) Consumer confidence and green purchase intention: an application of the stimulus-organism-response model. J Retail Consum Serv 68:103061. https://doi.org/10.1016/j.jretconser.2022.103061

27. Henseler J, Ringle CM, Sarstedt M (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. J Acad Mark Scie 43:115–135. https://link.springer.com/article/10.1007/s11747-014-0403-8
28. Hsu CL, Chang CY, Yansritakul C (2017) Exploring purchase intention of green skincare products using the theory of planned behavior: testing the moderating effects of country of origin and price sensitivity. J Retail Consum Serv 34:145–152. https://doi.org/10.1016/j.jretconser.2016.10.006
29. Jaeger AK, Weber A (2020) Can you believe it? The effects of benefit type versus construal level on advertisement credibility and purchase intention for organic food. J Clean Product 257:120543–120555
30. Jahdi KS, Acikdilli G (2009) Marketing communications and corporate social responsibility (CSR): marriage of convenience or shotgun wedding? J Bus Ethics 88(1):103–113. https://doi.org/10.1007/s10551-008-9830-5
31. Kaiser FG, Wolfing S, Fuhrer U (2015) Environmental attitude and ecological behaviour. J Environ Psychol 15(3):209–220
32. Kaiser FG, Ranney M, Hartig T, Bowler PA (1999) Ecological behavior, environmental attitude, and feelings of responsibility for the environment. Eur Psychol 4:59–74. https://doi.org/10.1027/1016-9040.4.2.59
33. Kock N (2015) Common method bias in PLS-SEM: a full collinearity assessment approach. Int J e-Collab 11(4):1–10
34. Kotler P, Armstrong GM (2010) Principles of marketing. Pearson Education India, London
35. Lee PTY, Feiyu E, Chau M (2022) Defining online to offline (O_2O): a systematic approach to defining an emerging business model. Internet Res 32(5):1453–1495. https://doi.org/10.1108/INTR-10-2020-0563
36. Likitapiwat T, Treepongkaruna S (2023) Staggered board, social capital and sustainability. Corp Soc Responsib Environ Manag 30(3):1524–1533. https://doi.org/10.1002/csr.2435
37. Lin X, Featherman M, Brooks SL, Hajli N (2019). Exploring gender differences in online consumer purchase decision making: An online product presentation perspective. Info Syst Fron 21:1187–1201. https://link.springer.com/article/10.1007/s10796-018-9831-1
38. Loureiro SMC, Guerreiro J, Han H (2022) Past, present, and future of pro environmental behavior in tourism and hospitality: a text-mining approach. J Sustain Tour 30(1):258–278. https://doi.org/10.1080/09669582.2021.1875477
39. Lu X, Sheng T, Zhou X, Shen C, Fang B (2022) How does young consumers' greenwashing perception impact their green purchase intention in the fast fashion industry? An analysis from the perspective of perceived risk theory. Sustainability 14(20):13473
40. Luchs MG, Naylor RW, Irwin JR, Raghunathan R (2010) The sustainability liability: potential negative effects of ethicality on product preference. J Mark 74(5):18–31. https://doi.org/10.1509/jmkg.74.5
41. Lv Y, Piao J, Li B, Yang M (2022) Does online investor sentiment impact stock returns? Evidence from the Chinese stock market. Appl Econ Lett 29(15):1434–1438
42. Ma Y, Liu C (2022) The impact of online environmental platform services on users' green consumption behaviors. Int J Environ Res Public Health 19(13):8009–8017
43. Mahasuweerachai P, Suttikun C (2023) The power of personal norms and green message framing persuade consumers' willingness to pay premium prices at eco-friendly restaurants. J Int Food Agribus Mark 10:1–25
44. Majeed MU, Aslam S, Murtaza SA, Attila S, Molnár E (2022) Green marketing approaches and their impact on green purchase intentions: mediating role of green brand image and consumer beliefs towards the environment. Sustainability 14(18):11703–11711
45. Melović B, Šehović D, Karadžić V, Dabić M, Ćirović D (2021) Determinants of Millennials' behavior in online shopping–implications on consumers' satisfaction and e-business development. Technol Soc 65:101561–101571. https://doi.org/10.1016/j.techsoc.2021.101561
46. Nam C, Cho K, Kim YD (2021) Cross-cultural examination of apparel online purchase intention: SOR paradigm. J Glob Fash Mark 12(1):62–76
47. Nayak J, Mishra M, Naik B, Swapnarekha H, Cengiz K, Shanmuganathan V (2022) An impact study of COVID-19 on six different industries: automobile, energy and power, agriculture, education, travel and tourism and consumer electronics. Expert Syst 39(3):e12677. https://doi.org/10.1111/exsy.12677
48. Nuseir MT (2020) The extent of the influences of social media in creating'impulse buying' tendencies. Int J Bus Innov Res 21(3):324–335. https://doi.org/10.1504/IJBIR.2020.105925
49. Onwezen MC, Antonides G, Bartels J (2013) The norm activation model: an exploration of the functions of anticipated pride and guilt in pro-environmental behaviour. J Econ Psychol 39:141–153
50. Orzan G, Cruceru AF, Bălăceanu CT, Chivu RG (2018) Consumers' behavior concerning sustainable packaging: an exploratory study on Romanian consumers. Sustainability 10(6):1787–1790. https://doi.org/10.3390/su10061787
51. Pachiyappan D, Alam MS, Khan U, Khan AM, Mohammed S, Alagirisamy K, Manigandan P (2022) Environmental sustainability with the role of green innovation and economic growth in India with bootstrap ARDL approach. Front Environ Sci 10:975177. https://doi.org/10.3389/fenvs.2022.975177/full
52. Prothero A, Dobscha S, Freund J, Kilbourne WE, Luchs MG, Ozanne LK, Thøgersen J, Freund J (2011) Sustainable consumption: opportunities for consumer research and public policy. J Public Policy Mark 30:31–38. https://doi.org/10.1509/jppm.30
53. Qiu Q, Wang Y, Qiao S, Liu R, Bian Z, Yao T, Nguyen TS (2020) Does air pollution affect consumer online purchasing behavior? The effect of environmental psychology and evidence from China. J Clean Product 260:120795
54. Qureshi MA, Khaskheli A, Qureshi JA, Raza SA, Khan KA (2023) Factors influencing green purchase behavior among millennials: the moderating role of religious values. J Islamic Mark 14(6):1417–1437
55. Reyna VF, Farley F (2006) Risk and rationality in adolescent decision making: implications for theory, practice, and public policy. Psychol Sci Public Interest 7(1):1–44. https://doi.org/10.1111/j.1529-1006.2006.00026.x
56. Ricci EC, Banterle A, Stranieri S (2018) Trust to go green: an exploration of consumer intentions for eco-friendly convenience food. Ecol Econ 148:54–65
57. Rook DW (1987) The buying impulse. J Consumer Res 14(2):189–199. https://doi.org/10.1086/209105
58. Ruangkanjanases A, You JJ, Chien SW, Ma Y, Chen SC, Chao LC (2020) Elucidating the effect of antecedents on consumers' green purchase intention: an extension of the theory of planned behavior. Front Psychol 11:1433–1443. https://doi.org/10.3389/fpsyg.2020.01433
59. Sadik-Zada ER, Gatto A, Blick N (2021) Rural electrification and transition to clean cooking: the case study of Kanyegaramire and Kyamugarura solar mini-grid energy cooperatives in the Kyenjojo district of Uganda. Sustainable Policies and practices in energy, environment and health research: addressing cross-cutting issues. Springer International Publishing, Cham, pp 547–562. https://doi.org/10.1007/978-3-030-86304-3_32
60. Saeed MA, Farooq A, Kersten W, Ben Abdelaziz SI (2019) Sustainable product purchase: does information about product sustainability on social media affect purchase behavior? Asian J Sustain Soc Responsib 4:1–18. https://doi.org/10.1186/s41180-019-0029-3
61. Sajjad M, Bhatti A, Hill B, Al-Omari B (2023) Using the theory of planned behavior to predict factors influencing fast-food consumption among college students. BMC Public Health 23(1):987. https://doi.org/10.1186/s12889-023-15923-1
62. Sangroya D, Nayak JK (2017) Factors influencing buying behaviour of green energy consumer. J Clean Prod 151:393–405. https://doi.org/10.1016/j.jclepro.2017.03.010
63. Sarah FH, Goi CL, Chieng F, Taufique KMR (2021) Examining the influence of atmospheric cues on online impulse buying behavior across product categories: insights from an emerging e-market. J Internet Commer 20(1):25–45. https://doi.org/10.1080/15332861.2020.1836593
64. Schroeder JE, de Haan P (2019) Online environmental platform services: using big data to support environmental sustainability. J Clean Prod 209:449–460. https://doi.org/10.1016/j.jclepro.2018.10.225
65. Shang D, Wu W (2022) Does green morality lead to collaborative consumption behavior toward online collaborative redistribution platforms? Evidence from emerging markets shows the asymmetric roles of pro-environmental self-identity and green personal norms. J Retailing Consum Serv 68:102993

66. Sharma K, Aswal C, Paul J (2023) Factors affecting green purchase behavior: a systematic literature review. Bus Strategy Environ 32(4):2078–2092. https://doi.org/10.1002/bse.3237
67. Sinha I, Batra R (1999) The effect of consumer price consciousness on private label purchase. Int J Res Mark 16(3):237–251. https://doi.org/10.1016/S0167-8116(99)00013-0
68. Straughan RD, Roberts JA (1999) Environmental segmentation alternatives: a look at green consumer behavior in the new millennium. J Consum Mark 16(6):558–575. https://doi.org/10.1108/07363769910297506
69. Strother J B, & Fazal Z (2011) Can green fatigue hamper sustainability communication efforts?. In: 2011 IEEE International professional communication conference (pp. 1–6). IEEE. https://ieeexplore.ieee.org/abstract/document/6087206/
70. Tariq A, Wang C, Tanveer Y, Akram U, Bilal M (2019) Online impulse buying of organic food: a moderated (website personality) mediation (social appeal) process. Int J Inform Syst Change Manag 11(1):3–24. https://doi.org/10.1504/IJISCM.2019.101646
71. Tehseen S, Ramayah T, Sajilan S (2017) Testing and controlling for common method variance: a review of available methods. J Manag Sci 4(2):142–168. https://doi.org/10.20547/jms.2014.1704202
72. United Nations (2019) Department of economic and social affairs, population division 2019. https://reliefweb.int/report/world/world-population-prospects-2019-highlights?gclid=Cj0KCQjww4-hBhCtARIsAC9gR3Yq1EqdXu-utFShQW5Tm9ozvb9espLmHIAg2OlqsFEphauxDsr6r5gaAsfJEALw_wcB
73. Usman M, Balsalobre-Lorente D, Jahanger A, Ahmad P (2022) Pollution concern during globalization mode in financially resource-rich countries: Do financial development, natural resources, and renewable energy consumption matter? Renew Energy 183:90–102. https://doi.org/10.1016/j.renene.2021.10.067
74. Usman M, Rofcanin Y, Ali M, Ogbonnaya C, Babalola MT (2023) Toward a more sustainable environment: understanding why and when green training promotes employees' eco-friendly behaviors outside of work. Hum Resour Manag 62(3):355–371. https://doi.org/10.1002/hrm.22148
75. Van Tonder E, Fullerton S, De Beer LT, Saunders SG (2023) Social and personal factors influencing green customer citizenship behaviours: the role of subjective norm, internal values and attitudes. J Retail Consum Serv 71:103190
76. Verhagen T, Van Dolen W (2011) The influence of online store beliefs on consumer online impulse buying: a model and empirical application. Inform Manag 48(8):320–327. https://doi.org/10.1016/j.im.2011.08.001
77. Vermeir I, Verbeke W (2006) Sustainable food consumption: exploring the consumer "attitude–behavioral intention" gap. J Agric Environ Ethics 19(2):169–194. https://doi.org/10.1007/s10806-005-5485-3
78. Vrontis D, Makrides A, Christofi M, Thrassou A (2021) Social media influencer marketing: a systematic review, integrative framework and future research agenda. Int J Consum Stud 45(4):617–644
79. Wang Y, Pan J, Xu Y, Luo J, Wu Y (2022) The determinants of impulsive buying behavior in electronic commerce. Sustainability 14(12):7500–7512
80. Wiranata AT, Hananto A (2020) Do website quality, fashion consciousness, and sales promotion increase impulse buying behavior of e-commerce buyers? Indones J Bus Entrepreneurship 6(1):74–74. https://doi.org/10.17358/ijbe.6.1.74
81. Wiser RH (1998) Green power marketing: increasing customer demand for renewable energy. Utilities Policy 7(2):107–119
82. Wu B, Yang Z (2018) The impact of moral identity on consumers' green consumption tendency: the role of perceived responsibility for environmental damage. J Environ Psychol 59:74–84
83. Wu L, Zhang Z (2020) Impact and threshold effect of internet technology upgrade on forestry green total factor productivity: evidence from China. J Clean Product 271:122657
84. Yuen KF, Ng WH, Wang X (2023) Switching intention in the online crowdsourced delivery environment: the influence of a platform's technological characteristics and relational bonding strategies. Technol Soc 72:102167
85. Zha Y, Li Q, Huang T, Yu Y (2023) Strategic information sharing of online platforms as resellers or marketplaces. Mark Sci 42(4):659–678
86. Zepeda L, Deal D (2009) Organic and local food consumer behavior: alphabet theory. Int J Consum Stud 33:697–705. https://doi.org/10.1111/j.1470-6431.2009.00814.x
87. Zeynalova Z, Namazova N (2022) Revealing consumer behavior toward green consumption. Sustainability 14(10):5806–5815. https://doi.org/10.3390/su14105806
88. Zhao X, Lynch JG Jr, Chen Q (2010) Reconsidering Baron and Kenny: myths and truths about mediation analysis. J Consum Res 37(2):197–206
89. Zheng GW, Siddik AB, Masukujjaman M, Alam SS, Akter A (2020) Perceived environmental responsibilities and green buying behavior: the mediating effect of attitude. Sustainability 13(1):35–42

Publisher's Note