Article

Examining the mediating role of environmental attachment: Exploring the role of green environmental awareness and sense of responsibility in promoting sustainable product consumption among Pakistani consumers

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Abstract: Purpose: This study investigates the mediating effect of Environmental Attachment (EA) among consumers in an emerging market, concentrating on the impact of two key factors: Green Environmental Awareness (GEA) and Sense of Responsibility (SOR) on Sustainable Product Consumption (SPC). **Design/methodology/approach:** A thorough online survey was carried out with Google Docs and distributed to 304 Pakistani consumers who now use or are considering purchasing sustainable or green products. Structural Equation Modeling (SEM) was used to rigorously test the suggested model utilizing a non-probability sampling technique, specifically the stratified purposive sampling approach. **Findings:** Green environmental awareness (GEA) and a sense of responsibility (SOR) have been shown to have a substantial impact on creating environmental attachment (EA) in both existing and potential customers of sustainable products. The findings of this study also revealed that environmental attachment (EA) plays an important role as a mediator in the links between green environmental awareness (GEA) and the consumption of sustainable goods (SPC), as well as between a sense of responsibility (SOR) and SPC. Despite this, it is crucial to note that the projected direct effect of GEA on SPC was shown to be statistically insignificant. This conclusion implies that additional factors outside the scope of this study may influence the relationship between GEA and SPC. **Research limitations/implications:** It is vital to highlight that the focus of this study is on an online sample of consumers near Punjab, Pakistan. Future studies should look at other parts of Pakistan to acquire a more complete picture of sustainable consumption trends. Furthermore, our findings suggest that characteristics impacting sustainable consumption, such as Green Environmental Awareness (GEA) and Sense of Responsibility (SOR), may differ among countries. As a result, performing a comparison analysis involving two or more countries could provide valuable insights into projecting sustainable product consumption among current and potential sustainable product customers. **Originality/Value:** This study contributes to the literature by investigating the factors of sustainable consumption using the lens of the Norm Activation Model theory (NAM), notably Green Environmental Awareness (GEA) and Sense of Responsibility (SOR), to predict sustainable product consumption. The findings are important for promoting long-term goals in Pakistan and provide a framework that can be applied in other emerging markets.

Keywords: factors of sustainability; sustainable consumption; green environmental awareness; sense of responsibility; environmental attachment; predict sustainable product consumption

1. Introduction

The issue of sustainability has become substantial worldwide. With the improving awareness towards environment globally, it is vital to understand the impact of environmental friendly lifestyle on the consumers (Matharu et al., 2020). Certainly, it has transformed the practice of consuming the sustainable products in mostly the developed countries of the world (Quoquab and Sukari, 2017). More clearly sustainable consumption has turned out to be a concern globally (Mensah, 2019). The idea of sustainability had its base in the developed countries like America, Belgium, England, Germany, France, Japan, Sweden and Netherlands (Meschede, 2020). In relation to this concept, different industries such as agriculture, electricity, food, clothing and other consumer goods have been flourished in the stream of sustainable consumption within those developed countries (Benyamin et al., 2018; Shin et al., 2018). Whether comparing the growth of sustainable consumption with the developing countries, it has been observed that very less attention has been paid to the sustainable growth in the countries like Pakistan, Afghanistan and Bangladesh (Jan et al., 2019). In contrast, the countries like China, India and Malaysia are embracing to thrive in the industry of sustainable consumption (Kautish et al., 2019).

Relatively a very few scholars have advocated on the negative effects of consumption affecting the environment (Jaiswal et al., 2021). The understanding about the issues that are associated with consumption of goods is low among general population in Pakistan (Parveen et al., 2020). Hence due to low environmental awareness the evolvement of adopting the sustainable consumption behavior is very slow in the consumers (Martin and Väistö, 2016). Undoubtedly, studies on the sustainable consumption are increasing the interest in consumers in terms of social, environmental and economic benefits that will result in creating the green environmental awareness which are well documented (Eckert and Kovalevska, 2021). Yet these findings are mostly conducted in the developed countries such as US, Europe, Germany, Australia, China and Brazil (Meschede, 2020).

Likewise, the research conducted in these countries do not provide adequate indicators about the findings conducted in the framework of South Asian countries (Sun et al., 2020). As affective, cognitive and behavioral factors differ from one country to another country (Anh et al., 2019; Rasool, et al., 2019). Unfortunately, based on the documented data a majority of the past studies conducted in Pakistan did not provide the evidence in understanding the factors leading to predict sustainable product consumption by keeping in view the interest of the consumers (Escalera-Reyes, 2020; Younis et al., 2015).

So far there is an absence of discussion and theoretical findings on the understanding to predict sustainable product consumption in the consumers with the factors affecting them such as there is a need to adopt the factors which translates the true meaning of the environmental awareness by developing the consciousness of the environment in the consumers (Novianti et al., 2018; Yang et al., 2020). Subsequently the changing consumption pattern required motivation to embrace the new habit of consuming sustainable products which seems to be difficult for people in Pakistan (Parveen et al., 2020; Stancu et al., 2020). Similarly, previous documented studies also provide evidence that most of the consumers are not aware of the negative

consequences of not practicing the sustainable consumption (Gravelines et al., 2022). However, studies have shown that the certain level of cost is associated with sustainable consumption (Yue et al., 2020). This is basically due to the fact that environmental friendly products are sometimes costly than the traditional goods. For itself, low-income group of people may not find it attractive (Tripathi and Singh, 2016).

Previous a lot of studies have been conducted on sustainability. Though the major chunk of these studies were focused towards barriers, problems and prospects lies in Sustainable Consumption and production (Verma et al., 2022). Additionally, the most of the studies were conducted in U.S, UK, Germany, Spain, China, Malaysia and India. However, a majority of these studies were directed towards industries such as electricity, apparel, agriculture and food industry (Benyamin et al., 2018). Moreover, it was established that numerous of the previous studies were conducted from the production perspective of sustainability with the nominal evidence from business side (Fang et al., 2019).

There exists a gap in these studies as the relationship between factors such as green environmental awareness and sense of responsibility with the mediating role of environmental attachment in order to predict sustainable product consumption from the consumer's perspective in the context of Pakistan.

2. Literature review

The topic of sustainable consumption has ignited global debate, marking its emergence in society with the commencement of the twenty-first century (Eckert et al., 2021). Additionally, in 2015, the United Nations introduced its 17 Sustainable Development Goals (SDGs) (Bexell and Jönsson, 2017). Consequently, these goals highlight approaches for enticing people to rediscover sustainable consumption habits, emphasizing the necessity to encourage sustainable consumption behavior (Asadullah et al., 2020; Fischer et al., 2017). For instance, the increase in human consumption globally has severely damaged the environment and the earth. Promptly the urbanization within South Asian countries has observed the depletion of natural resources and overspill of waste material (David et al., 2019). Similarly, global issues like global warming and air pollution have made customers more environmentally conscious of their purchases and their impact on the environment (Nasir et al., 2020). Additionally, factors like social influence, habit formation, Individual self, and feelings are shifting consumer behavior to save resources by developing a sense of responsibility for them (White et al., 2019). Hence the resources can be protected by reusing the waste materials by recycling them to the optimum level (Mittal and Gupta, 2015).

Established literature narrated that to a large extent advancement toward sustainable development creates employment at the global level (Hosta and Zabkar, 2020; Shimova, 2019). Employment within the sustainable industry in Europe increased from 3.1 million to 4.2 million in 2017. The changes in sustainable consumption patterns can create around 18 million jobs throughout the world economy (Yue et al., 2020). Equally important, global companies are moving toward sustainable products to attract consumers to sustainability (Shimova, 2019). Indeed, the consumption of sustainable products has increased the market share which leads to

economic growth (Sharma et al., 2019). However, in Europe, 75% of millennials were reported to be interested in sustainable products. Revenue in 2018 was 16.6% higher than in 2013, resulting in $114 billion in sales revenue. The trend for sustainable products grew 5.6% more than other conventional products. In 2017 revenue was €34.3 billion in Europe in which Germany accounts for €10 billion and France makes €7.9 billion respectively (Austin Kennedy, 2019). On the other hand, the global economy has grown by 1.5% in 2020 (Gelski, 2019). Many developing regions such as East Africa and East Asia are expected to continue rapid income growth. Not to mention, environmental sciences on sustainable consumption primarily focus on how environmental concerns are a key factor in purchasing decisions and how society can address growing consumption levels for sustainable development (Mancini et al., 2017). In Pakistan, sustainable product consumption needs to be studied. There is only a 0.8% contribution from Pakistan to sustainable development at the global level (Sahibzada et al., 2017).

A study was conducted in the USA in which the researcher was of the view that there is a relationship between environmental factors with various sustainable behaviors which increases the motivation of consumers to change their consumption patterns into sustainable ones (Guckian et al., 2017). Another study was conducted in Germany in which it was found that among German consumers there is a social influence on adopting sustainable practices in people which will lead consumers to sustainable consumption (Hoffmann et al., 2024).

In another research conducted in India, it was found that the intention of Indian consumers towards sustainable product consumption was positive but factors like the subjective norm, consumer attitude, and perceived behavioral control have a significant role in influencing the intentions of consumers (Matharu et al., 2020).

The study conducted in Brazil also revealed that value has been created with the influence of social factors in sustainable consumption among consumers (Matzembacher and Meira, 2019). Several studies have been established in the past about the sustainable consumption patterns of consumers. However, the majority of these studies were directed toward America, Europe, India, Germany, and Brazil. Although it is crucial to adopt the factors that explain the true meaning of environmental awareness by developing the consciousness of the environment in the consumers, there is a dearth of literature and theoretical findings on the understanding to predict sustainable product consumption in the consumers with the factors affecting them (Rezvani et al., 2018; Yang et al., 2020).

Various well-established studies concentrate on how consumer attitudes, environmentally conscious purchasing practices, and environmental concern influence the adoption of sustainable products. Second, the consumption of sustainable products varies based on the study's investigated antecedents, such as the relationship between place attachment, responsibility, and green environmental consciousness (Confente and Scarpi, 2021; Sartal et al., 2020).

To extend the literature, according to various researches it is said that for any nation, sustainability is important for a very simple reason as the quality of life cannot be maintained until sustainable consumption is assured, it interconnects the diverse aspects of the environment such as different resources on which humans are dependent (Bick et al., 2018). Not surprisingly, the world where natural resources are depleting,

there are adverse effects of not protecting the environment globally. Therefore, the reason of sustainable consumption is to meet current needs without diminishing future generations and the planet in the long run (Lorek and Spangenberg, 2014).

Yet, most of the articles associate the idea of sustainability with green environmental concept (Kumar and Yadav, 2021). Moreover, another approach towards motivation behind sustainable consumption includes green brand equity, green branding and green purchase behavior which comes under the umbrella of sustainable product consumption (Khandelwal et al., 2019). Furthermore, the concept of sustainable consumption concept is apparently comprehensive.

Numerous studies have examined that sustainable products are those that hold the potential to improve customer environmental responsibility, comprehend benefits in long term and reduce consumer stress while maintaining its positive qualities (Hume, 2010). It is significant to note that the intention to buy the sustainable products will project the environmental friendly image on consumers that will enable them to reflect their commitment towards the environment and distinguish themselves from others (Xu and Han, 2019). On the other side, Xu and Han (2019) discuss in their article that environmental awareness influences the attachment with the local environment and its resources. The awareness prevails with the behavior and emotions between the environment and the people. It happens due to the environmental attachment that people tend to behave in environmental friendly manner which is the reason behind their environmental awareness (Jansen, 2019) describes in his research that people show their attachment to the same place due to different social factors including the awareness of the environment that entails consciousness about green environment and cognition of behavior which further exhibit the feelings, knowledge and the understanding of environment through senses that drives the positive attitude in people towards the environmental friendly living which will increase the chances in creating the green environmental awareness in consumers. Cheng and Chen (2022) conducted the research in Spain in which it is revealed that sense of responsibility is essential in relation to the environmental attachment in which it is measured that creating belonging to the certain environment helps in developing the responsible behavior in terms of the environmental perspective in turn the healthy behavior and positive outcomes are examined which connotes the satisfaction in consumers about minimizing the impact of individual actions on the natural resources. Lee et al. (2016) conducted his research in which they explain in their research that individuals who are strongly bonded to a certain environment having environmental friendly attitude are more likely to consume sustainably with the carefulness to protect the environment. The sense of self with an environment describes the individual's strong attachment with the place which minimizes the environmental effects that results in the responsible consumption. Tauheed (2021) discussed in his article in USA that cultural and personal factors plays an important role in order to develop potential for environmental attachment which in-turns leads to sustainable consumption (Shao and Liu, 2017).

The study of sustainable product consumption has become a new area of focus for consumer research because of the shifting trends in consumers' evolving purchasing behavior. To forecast the consumption of sustainable products, this thesis focuses especially on evaluating the mediating effect of environmental attachment.

3. Model and hypothesis

3.1. Norm activation model

Given figure demonstrates hypothetical the relationships between variables and all hypothetical relationships explained in section 3.2 refers to **Figure 1**.
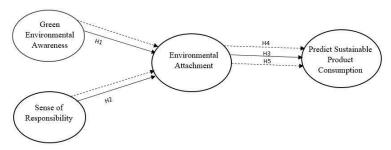

Figure 1. Conceptual framework.

3.2. Hypothesis development

Significant scholarly research and debate on environmental awareness have been conducted in several contexts, including green marketing, corporate social responsibility, and sustainable development. On this vital subject, various authors and scholars have offered various definitions and viewpoints (Żelazna et al., 2020).

Environmental awareness, as defined by the International Environmental Education Program Zsóka et al. (2013), is "consciousness and understanding of the environment and its associated problems, including human interactions and their effects". This fundamental notion emphasizes the multifaceted nature of environmental awareness. According to a widely accepted definition, environmental awareness refers to how connected or concerned a person is with environmental issues. This viewpoint emphasizes the emotional and personal connection people have to environmental issues, emphasizing the importance of personal dedication and involvement. Furthermore, Oe et al. (2022) defined green environmental awareness as "the inner drive within an individual to actively contribute to the resolution of environmental challenges." This initiative is important in encouraging green consumption habits among consumers by emphasizing the practical impact of environmental awareness on consumer choices and activities. According to Nasir et al. (2020) and Shabbir et al. (2020) environmental challenges in Malaysia have catalyzed boosting public awareness about the importance of environmental protection (Apichatibutarapong, 2018). This discovery underscores the notion that environmental awareness is a practical reaction to the environmental difficulties that communities face. Kopnina (2018) shed light on the transformative potential of environmental awareness, claiming that it fosters a sense of connection with nature. This relationship, in turn, encourages natural resource conservation and corresponds with the ideals of sustainable development by stressing the long-term benefits of increased environmental awareness. Xu and Han, (2019) also investigate the complex interaction between environmental awareness and attachment to the local environment and its resources. Their findings show that environmental awareness influences human behaviors and emotions, ultimately generating ecologically favorable behaviors. This viewpoint emphasizes the function of environmental attachment as a motivator for

environmentally conscious behavior. Jansen's (2019) study emphasizes the role of social variables in shaping environmental attachment, with environmental awareness playing an important role. In this sense, environmental awareness includes not only cognitive understanding but also emotional and sensory experiences that motivate individuals to adopt positive attitudes and ecologically friendly behaviors (Buonincontri et al., 2017). According to the extant research, environmental awareness is a multidimensional term with multiple facets. It is also recognized that the expression and impact of environmental consciousness varies among countries and circumstances (Raymond et al., 2017). Given this context, it is critical to provide a hypothesis that demonstrates a strong relationship refers to **Figure 1**:

H1: Green environmental awareness is significantly and positively correlated with environmental attachment.

This hypothesis proposes that individuals with strong green environmental awareness are more likely to feel deeply associated with the environment, which fosters increased commitment to environmental conservation and sustainable practices. This hypothesis forms the basis for empirical investigation, predominantly in Pakistan's context.

According to research, responsibility plays a critical role in molding individuals' attitudes and values within society, ultimately promoting environmentally friendly activities (Fenitra et al., 2022). Similarly, Du et al. (2018) underline that a sense of responsibility develops a commitment to protective acts toward nature, demonstrating a deep connection to treasured locations and a commitment to environmental preservation. This sense of responsibility includes characteristics such as a dedication to minimizing environmental harm and establishing a deep connection between people and the natural world (Rutha and Abbas, 2020). Furthermore, Bartoszczuk et al. (2022) did a study in Poland that emphasizes the importance of consumer responsibility in discovering social motives associated to specific regions and proposing pathways toward sustainability. Similarly, Al Mubarak (2020) study in Bahrain emphasizes the complex aspect of environmental preservation, which involves addressing social, economic, and ecological elements to develop a sustainable environment and instill a drive for sustainability in customers (Rakic and Rakic, 2018). This collection of literature, categorized as Sustainable Development, Green Marketing, and social responsibility, illustrates differences in the appearance of a sense of responsibility between countries (Palacios-González and Chamorro-Mera, 2020). Furthermore, it is consistent with the view that Pakistan, too, has different characteristics of a sense of responsibility that have a significant impact on environmental connection.

H2: A sense of responsibility exhibits a significant positive relationship with environmental attachment.

This hypothesis expands on scholarly studies by emphasizing the significance of a sense of responsibility as a catalyst for cultivating a strong connection to the environment. It contends that people who have a strong feeling of responsibility are more likely to acquire a strong attachment to the environment, resulting in a stronger commitment to environmental preservation. This theory serves as the framework for empirical investigation, notably in Pakistan.

Several researchers have contributed to the understanding of environmental attachment, offering various definitions and dimensions. Environmental attachment is

a deep connection between people and their surroundings that includes the aspects of Person, Process, and Place. This multidimensional idea sheds light on environmentally conscious customer behavior (Razem and El Kaftangui, 2020). Individuals who have strong environmental attachments are more interested in preventing environmental harm. Environmental attachment, in general, impacts people's attitudes and social norms, promoting the development of sustainable attitudes in consumers (Ramkissoon et al., 2012). Lee et al. (2016) did a study that demonstrates how individuals who have a deep attachment to a certain environment have environmentally friendly attitudes and are more likely to engage in sustainable consumption habits to protect that ecosystem. The concept of self-identification with an environment denotes a person's strong attachment to a location, which in turn reduces environmental damage and promotes responsible consumption. Colea et al. (2021) illustrate in the research conducted in the United States that cultural and personal factors both play important roles in establishing the potential for environmental attachment, which leads to sustainable consumption. Furthermore, research findings show that an individual's attitude toward the environment can predict their attitude toward sustainable consumption, leading to a commitment to that environment and, as a result, fostering a positive attitude toward sustainable consumption behaviors (Gurney et al., 2017). Isa et al. (2019) conducted research in Indonesia and found that attachment occurs when people consider their surroundings to be fundamental parts of themselves and coincide with their goals. Consumers' previous experiences can contribute to the development of sustainable behavior. Consuming sustainable products has the goal of reducing waste, minimizing resource usage, and changing purchasing patterns to encourage sustainable product consumption (Young et al., 2010). The following hypothesis is offered based on this body of literature and informed by the theoretical framework and preliminary quantitative study objective.

H3: Environmental attachment significantly predicts sustainable product consumption.

This hypothesis emphasizes the significant influence of environmental attachment on customers' tendency to engage in sustainable product consumption. It contends that people who have strong environmental attachments are more likely to engage in activities that are consistent with the consumption of sustainable products, which is congruent with their commitment to environmental preservation. This hypothesis serves as the foundation for empirical investigation, giving a framework for evaluating the relationship between environmental attachment and sustainable product use.

Environmental attachment has been identified as a critical mediator across multiple dimensions of sustainability research (Thorisdottir and Johannsdottir, 2019). Notably, it includes attachment levels connected to perception and social factors, with those with strong place attachment having a larger proclivity for sustainable purchasing. Individuals with a lack of environmental attachment are less likely to be environmentally friendly. Furthermore, Kil et al. (2012) emphasize the significance of environmental attachment as a mediator in linking nature-based intents to various components of environmental friendliness. This mediation emphasizes how a strong attachment to the environment serves as a link between people's naturalistic intentions and ecologically friendly behavior. Čapienė et al. (2021) underline the mediating role

of environmental attachment in the relationship between green consumption and green development in a distinct scenario. This mediation mechanism demonstrates how environmental attachment helps to match green consumption patterns with broader green development goals. In addition, research conducted in China by Hu et al. (2019) provides valuable insights into the nature and dynamics of environmental attachment. In light of this body of literature, and guided by the theoretical framework and quantitative study of objective (4), the following hypothesis is proposed:

H4: Environmental attachment acts as a mediator between green environmental awareness and the prediction of sustainable product consumption.

Environmental attachment mediates the relationship between green awareness and sustainable product consumption, implying that people who are connected to the environment are more likely to consume environmentally friendly products. This theory directs empirical investigation into the role of mediation.

Environmental attachment appears as an important mediator in the relationship between a sense of responsibility and the prediction of sustainable product consumption. This mediating role has the potential to either increase or decrease the impact of responsibility. Hosany et al. (2017) discovered that in Taiwan's tourism sector, environmentally responsible (Dlamini et al., 2021) behavior is linked to the intervening role of environmental attachment between responsibility and environmental action, exemplifying the role of environmental attachment as a mediator. Environmental attachment is indistinguishably linked to values and attitude functions, boosting consumers' sense of responsibility (Cheng and Chen, 2022). Environmental attachment was investigated as a binding force leading individuals to nurture multiple dimensions of ecologically responsible behavior in a study done in China (Liu et al., 2017). According to the findings of some studies (Hosany et al., 2017), environmental attachment generates a heightened sense of responsibility. Furthermore, Yue et al. (2020) discovered that environmental attachment combines social norms with personal norms, stimulating a person's sense of responsibility. An Indonesian study found that environmental connection inspires people to prioritize environmental issues and take proactive steps to safeguard the environment (Isa et al., 2019). These studies show that environmental connection can greatly encourage responsible behavior among consumers, promoting the consumption of sustainable products. The following hypothesis is offered based on this body of research and guided by the theoretical framework and preliminary quantitative study.

H5: Environmental attachment mediates the relationship between a sense of responsibility and the prediction of sustainable product consumption.

This hypothesis highlights the key mediating role of environmental attachment in shaping the link between a sense of responsibility and the inclination toward sustainable product consumption. It contends that people who have a strong sense of responsibility for the environment are more inclined to engage in environmentally conscious behavior. This hypothesis serves as the foundation for empirical research, giving a framework for examining how environmental attachment mediates the relationship between responsibility and sustainable product consumption.

4. Research methodology

4.1. Sample

Sampling techniques in research are characterized as probability and non-probability sampling methods. Given the lack of specific population estimates for existing and potential users of sustainable products in Pakistan, this study chose a non-probability sampling approach to successfully collect data. Specifically, purposive sampling, a component of non-probability sampling, has been employed to gather data from consumers of sustainable products in the Punjab province of Pakistan. The restricted availability of statistics pertaining to consumers of sustainable products in this specific geographic area prompted the use of this sampling method. The unit of analysis in this study was consumers who use sustainable products. As a result, the non-probability sampling framework was used to apply the purposive sampling technique. Based on this identified group, a total sample size of 304 participants was determined. It is important to highlight that this study used a non-probability sampling method, therefore caution should be used when attempting to generalize the findings to the larger population. The sample process, as described above, was purposefully chosen to suit the research aims and the study's specific setting.

4.2. Instrument

Data collection in this research utilized a questionnaire, collaboratively developed by various authors. The questionnaire analyzed crucial elements influencing sustainable product consumption, with a particular emphasis on green environmental awareness, a sense of responsibility, and place attachment. Respondents were provided with a seven-point Likert scale to offer a more refined and comprehensive expression of their views (Quoquab et al., 2019). In accordance with the research objectives, the selection of this scale aimed to improve respondent comfort and data accuracy.

4.3. Data analysis

Participants from Pakistan's Punjab region willingly participated in this study by responding to properly crafted questions. The measuring technique, which was a key component of this study, aided in the extraction of relevant insights even with a small sample size, which was consistent with previous research findings. The measurement and structural models effortlessly incorporated the constituent items and factors, supporting the study's reliability and validity (Ab Hamid et al., 2017). The data analysis, as presented in **Table 1**, underscores the robustness of the measurement process. Green Environmental Awareness (GEA) displayed a reliability value of 0.82, Environmental Attachment (EA) achieved a value of 0.85, Sense of Responsibility (SR) recorded an impressive 0.90, and Predicting Sustainable Product Consumption (PSPC) displayed a value of 0.86. These reliability values, approaching 1, affirm the substantial reliability of the measurement constructs. Furthermore, the composite reliabilities of all constructs surpassed the established threshold of 0.7, further reinforcing their reliability (Afthanorhan, 2013). An Average Variance Extracted (AVE) value greater than 0.50 is considered noteworthy by established criteria. As a

result, the AVE values for all variables in this investigation comfortably exceeded this threshold, demonstrating the measuring process's precision and usefulness. This particular measuring approach, which is imperative to this research, improves the study's validity and credibility by ensuring that the findings are based on sound empirical foundations refer to the **Table 1**.

Table 1. Reliability analysis of constructs.

Constructs	Source	Items	Reliabilities
Green environmental awareness	Zelezny and Schultz (2000)	4	0.82
Sense of Responsibility	Grewal, Rajdeep, Raj Mehta, and Frank R. Kardes (2004)	6	0.9
Environmental attachment	Scannell, R. Gifford (2010)	6	0.85
Predict sustainable product consumption	Gild Barr and Ford (2005)	5	0.86

4.4. Test of hypothesis

This research adhere predefined significance levels include 0.05, 0.01, and 0.10. (*$p < 0.1$, **$p < 0.05$, ***$p < 0.01$).

H1 (Green environmental awareness → Environmental attachment): The path analysis conducted using bootstrapping provided support for Hypothesis 1 (H1: $\beta = 0.136$, $t = 2.159$, $p = 0.031$). This result indicates a statistically significant relationship between Green Environmental Awareness and Environmental Attachment refers to the **Table 2**.

H2 (Sense of responsibility → Environmental attachment): The path analysis, likewise via bootstrapping, supported Hypothesis 2 (H2: $\beta = 0.662$, $t = 11.812$, $p = 0$). This outcome signifies a statistically significant and robust relationship between Sense of Responsibility and Environmental Attachment refers to the **Table 2**.

H3 (Environmental attachment → Sustainable product consumption): The path analysis, again employing bootstrapping, supported Hypothesis 3 (H3: $\beta = 0.618$, $t = 11.38$, $p = 0$). This result demonstrates a statistically significant connection between Environmental Attachment and Sustainable Product Consumption refers to the **Table 2**.

H4 (Mediating effect of environmental attachment): Hypothesis 4 (H4) posited that Environmental Attachment acts as a mediator between the factors of Green Environmental Awareness and Sense of Responsibility in predicting Sustainable Product Consumption. The analysis showed that Environmental Attachment had a significant mediating role, evidenced by a significant total effect (H4: $\beta = 0.084$, $t = 2.109$, $p = 0.035$) and indirect effect (H4: $\beta = 0.084$, $t = 2.109$, $p = 0.035$). However, the direct effect (H4: $\beta = 0.124$, $t = 1.118$, $p = 0.135$) was found to be statistically insignificant refers to the **Table 2**.

H5 (Mediating effect of environmental attachment): Hypothesis 5 (H5) proposed that Environmental Attachment acts as a mediator between Sense of Responsibility and Sustainable Product Consumption. The analysis revealed that Environmental Attachment played a significant mediating role, as indicated by a substantial total effect (H5: $\beta = 0.409$, $t = 6.914$, $p = 0$), a significant direct effect (H5: $\beta = 0.464$, $t = 3.977$, $p = 0$), and a significant indirect effect (H5: $\beta = 0.409$, $t = 6.914$,

$p = 0$) refers to the **Table 2**.

In summary, the path analysis results utilizing bootstrapping give significant empirical support for the research hypotheses, emphasizing the importance of Green Environmental Awareness, Sense of Responsibility, and Environmental Attachment in predicting Sustainable Product Consumption. Furthermore, the mediation study highlights the importance of Environmental Attachment as a mediator in these relations, which contributes to a more comprehensive understanding of the factors driving sustainable consumption behavior.

Table 2. Hypothesis testing results.

Relationships	β value	Sample mean	Standard deviation	T Statistics	*P* Values	f^2	Q^2	q^2	Decision
H1: GEA → EA	0.136	0.139	0.063	2.159**	0.031	0.0879	0.1368	0.0334	Supported
H3: EA → PSPC	0.618	0.624	0.054	11.38**	0	0.5786	0.3156	0.2065	Supported
H2: SR → EA	0.662	0.666	0.056	11.812**	0	0.0574	0.3156	0.2043	Supported

Note: *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$.

4.5. Mediating effect of EA

The analysis of Hypothesis 5 (H5) revealed compelling findings regarding the role of environmental attachment as a mediator in the relationship between a sense of responsibility and the prediction of sustainable product consumption. Specifically, the path analysis conducted via bootstrapping supported Hypothesis 5, demonstrating that environmental attachment played a full mediating role in this relationship. The results were consistent across various measures, including the total effect (H5: $\beta = 0.409$, $t = 6.914$, $p = 0$), the direct effect (H5: $\beta = 0.464$, $t = 3.977$, $p = 0$), and the indirect effect (H5: $\beta = 0.409$, $t = 6.914$, $p = 0$), all of which were statistically significant. These findings provide empirical evidence that environmental attachment acts as a robust mediator, facilitating the influence of a sense of responsibility on the prediction of sustainable product consumption.

These results align with previous research conducted in different geographical contexts, underscoring the universality of the mediating role of environmental attachment. Notably, a study conducted in Malaysia by Hosany et al. (2017) documented that place attachment fosters a sense of responsibility in individuals, motivating them to act responsibly. Similarly, research in Indonesia revealed that environmental attachment encourages individuals to focus more on environmental issues and proactively engage in responsible behaviors for environmental protection (Isa et al., 2019). The consistent findings across diverse studies highlight the pivotal role of environmental attachment in shaping responsible and sustainable behaviors.

In summary, the empirical support for Hypothesis 5 (H5) underscores the mediating function of environmental attachment in linking a sense of responsibility to the prediction of sustainable product consumption. These results contribute to a comprehensive understanding of the mechanisms driving sustainable consumption behavior, emphasizing the crucial role of attachment to the environment in promoting responsible and sustainable choices. Consequently, Hypothesis 5 is accepted, affirming the full mediation of environmental attachment in this relationship refers to the **Table 3**.

Table 3. Relationship of mediation analysis.

Relationship	Total effect (GEA → PSPC) & (SR → PSPC)		Direct Effect (GEA → PSPC) & (SR → PSPC)		
	Coefficient	*P*.Value	Coefficient	*P*-Value	Decision
(GEA→PSPC)	0.084	0.035	0.124	0.135	Not supported
(SR → PSPC)	0.409	0	0.464	0.036	Supported
Indirect Effect of GEA on PSPC and SR on PSPC					
	Coefficient	SD	*P*.Value	*t* value	CI	Decision
GEA → EA → PSPC	0.084	0.04	0.035	2.109**	(0.011, 0.161)	Supported
SR → EA → PSPC	0.409	0.059	0	6.914**	(0.293, 0.530)	Supported

Note: *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$.

5. Discussion

The results of the hypothesis (H1) shows that the green environmental awareness has a significant impact on environmental attachment in the sustainable products industry of Pakistan. The hypothesis one was connected with the research question 1 (RQ1): Does green environmental awareness will have a relationship with environmental attachment?

The path analysis via boot strapping for hypothesis (H1) was supported (H1: $\beta = 0.136$, $t = 2.159$, $p = 0.031$). Refer to **Table 3**. for the comprehensive results. Additionally, the acceptance of hypothesis (H1) was also in favor with the studies established in the past. According to Raza and Khan (2022) green environmental awareness improves the association of an individual with the natural environment which results in the sustainable development.

Xu and Han (2019) discuss in his article that the environmental awareness initiates with the emotions and behavior between the environment and the people. It is due to the environmental attachment that people tend to behave in environmental friendly manner which is the reason behind their environmental awareness. In the light of the existing literature, green environmental awareness is considered to be an important factor influencing the environmental attachment. Hence, hypothesis one is accepted.

The results of the hypothesis (H2) shows that the sense of responsibility has a significant impact on environmental attachment in the sustainable products industry of Pakistan. The hypothesis two was connected with the research question 2 (RQ2): Does sense of responsibility will have a relationship with environmental attachment?

The path analysis for hypothesis (H2) was supported (H2: $\beta = 0.662$, $t = 11.812$, $p = 0$). Refer to **Table 3** for the comprehensive results. Additionally, the acceptance of hypothesis (H2) was also in support with the literature established in the past. For instance, a research was conducted by Du et al. (2018) in which he said that sense of responsibility creates the motivation for defensive actions in individuals towards the nature which creates their image about place that people value and strive to preserve the environment.

Moreover, a study in Poland by Panda et al. (2020) indicated that sense of responsibility in the consumers helps to identify the features like social motivation towards environment and help us to develop the pathways in the direction of the sustainability. In the context of the present literature sense of responsibility plays an

important role in creating the environmental attachment. Hence, hypothesis two is accepted.

6. Conclusion

The conclusion for this quantitative study were found according to the results and discussion of the study. At first the results were concluded for the measurement model. Thus, this led to the conclusion of confirmatory factor analysis for the structural model on the basis of five hypothesis documented in the light of research objectives. The first three hypotheses (H1, H2 and H3) were focused towards testing the relationship of green environmental awareness with environmental attachment, sense of responsibility with environmental attachment and environmental attachment with predict sustainable product consumption. The last two hypotheses (H4 and H5) were focused towards testing the mediating effect of environmental attachment between the factors of sustainability green environmental awareness and sense of responsibility with the predict sustainable product consumption. Lastly the chapter was concluded by theoretical contribution, managerial implications, conclusion, limitation and future research direction.

The results of the hypothesis (H3) shows that the environmental attachment has a significant impact on to predict sustainable product consumption in the sustainable products industry of Pakistan. The hypothesis three was connected with the research question 3 (RQ3): Does environmental attachment will have relationship in order to predict sustainable product consumption?

The path analysis via boot strapping for hypothesis (H3) was supported (H3: β = 0.618, t = 11.38, p = 0). Refer to **Table 2** for the comprehensive results. A study was conducted in which it reveals that the sustainable consumption attitude can be predicted by the individual attitude towards the environment as it leads to the commitment to that environment which results in positive attitude towards sustainable consumption behavior (Gurney et al., 2017). However, Lee et al., (2016) conducted his research in which he described that individuals who are more attached to a certain environment having environmental friendly attitude are those in which there is a strong possibility to consume sustainably with the care to protect the environment. Additionally, the acceptance of hypothesis three was also in support with the literature established in the past. Hence hypothesis three is accepted.

The results of the hypothesis (H4) shows that environmental attachment plays a partial mediating or intervening role between relationship of green environmental awareness and to predict sustainable product consumption. The hypothesis four was related to the research question 4 (RQ4): Does environmental attachment mediates the relationship between green environmental awareness and to predict sustainable product consumption?

The path analysis via boot strapping for hypothesis (H4) was supported for total effect, (H4: β = 0.084, t = 2.109, p = 0.035), for direct effect (H4: β = 0.124, t = 1.118, p = 0.135) it was insignificant and for the indirect effect (H4: β = 0.084, t = 2.109, p = 0.035) it was significant. Refer to **Table 2** for the comprehensive results.

Several studies have been conducted on the mediating role of environmental attachment in Sweden, U.K, Switzerland, Slovenia, Belgium, Austria, Netherlands,

Germany,

Australia, Hong Kong, Brazil, Norway, Finland, Czech Republic, Denmark, Canada, Ireland, Malaysia, Singapore and Japan mostly (Meschede, 2020). Similarly, a research was conducted in China by Hu et al. (2019) and it describes that environmental attachment mediates between social responsibility and consumer behavior in green products. Moreover, in a research it states that environmental attachment act as a mediator in between nature based intensions and different components of environmental friendliness (Al Mubarak, 2020; Kil et al., 2012). Likewise, environmental attachment fully mediates the relationship between green environmental awareness and sustainable product consumption. Consequently, the acceptance of hypothesis (H4) was also in support with the literature established in the past. Hence, hypothesis four is accepted.

The results of the hypothesis (H5) reveal that environmental attachment plays a full mediating role between relationship of sense of responsibility and to predict sustainable product consumption. The hypothesis five was related to the research question 5 (RQ5): Does environmental attachment mediates the relationship between sense of responsibility and to predict sustainable product consumption?

The path analysis via boot strapping for hypothesis (H5) was supported for total effect, (H5: $\beta = 0.409$, $t = 6.914$, $p = 0$), for direct effect (H5: $\beta = 0.464$, $t = 3.977$, $p = 0$) it was also significant and for the indirect effect (H5: $\beta = 0.409$, $t = 6.914$, $p = 0$). it was significant. Refer to **Table 2** for the comprehensive results.

A study in Malaysia by Hosany et al. (2017) documented that that place attachment nurtures the responsibility in an individual to act responsibly. In another research it was established that due to attachment of the environment individuals adopt social norms into the personal norms which activates the sense of responsibility in them (Yue et al., 2020).

Consequently, a study was conducted in Indonesia, it was established that environmental attachment will determine individuals to focus more on the environmental issues and take initiative to act responsibly for the protection of the environment (Isa et al., 2019). Moreover, the acceptance of hypothesis (H5) was also in support with the literature established in the past. Subsequently, environmental attachment fully mediates the relationship between sense of responsibility and sustainable product consumption. Hence, hypothesis five is accepted.

7. Implications

Significance of the study results: The study's findings underline the critical relevance of three important elements in predicting sustainable product consumption: green environmental awareness, a sense of responsibility, and environmental attachment. These factors shed light on the intricate dynamics of consumer behavior in a specific context, namely Pakistan. This study provides useful insights into the paths through which consumers adopt sustainable purchasing patterns by identifying and comprehending these significant aspects.

Limitation of non-probability sampling: It is critical to note that the study utilized non-probability sampling methods to gather data from respondents. This approach, while suitable for the research context exhibits few limitations. Non-

probability sampling may not provide a fully representative sample of the entire population, which can limit the generalizability of the study's findings beyond the sampled group. However, it's worth observing that non-probability sampling was chosen as the most practical method for a population where statistics on sustainable product consumers were limited. Despite this constraint, the insights gained from the study remain valuable for understanding the behavior of consumers in similar contexts.

Implications for policymakers and businesses: The research findings hold significant implications for policymakers and businesses, particularly those operating in Pakistan and other similar settings. Policymakers can use the identified variables of green environmental awareness, sense of responsibility, and environmental attachment as critical components of their strategies to promote sustainable product consumption. Taking into account how these factors influence the behavior of consumers allows policymakers to suggest targeted actions and campaigns that resonate with local consumers.

Contributing to global sustainability: By implementing these factors and strategies that foster sustainable consumption practices, Pakistan can contribute to the broader global sustainability agenda. As nations around the world strive to achieve the United Nations Sustainable Development Goals (SDGs), including those related to environmental sustainability and responsible consumption, Pakistan's efforts to promote sustainable product consumption can align with and support these global objectives.

In conclusion, while the study's non-probability sampling may limit the generalizability of findings, the insights gained from this research are extremely valuable for understanding consumer behavior and designing effective strategies to promote sustainable product consumption in Pakistan and similar contexts. By embracing these insights and aligning them with the global sustainability agenda, Pakistan has the potential to catalyze meaningful shifts toward more sustainable consumption practices.

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