A multidimensional lens of environmental consciousness: towards an environmentally conscious theory of planned behavior

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Abstract

Purpose – The purpose of this paper is to examine the purchase behavior of consumers towards green products by adapting and extending the theory of planned behavior with the inclusion of three pertinent environmental factors posited to reflect environmental consciousness in the form of environmental concern, environmental knowledge and environmental values.

Design/methodology/approach – The data was collected from 410 consumers at shopping malls with retail stores selling green and non-green products in a developing country using cluster sampling and analyzed using covariance-based structural equation modeling.

Findings – The findings of this study indicate that environmental factors reflecting environmental consciousness positively influence consumers' attitude towards purchasing green products, wherein consumers' environmental values have a stronger influence than their environmental concern and environmental knowledge. The findings also reveal that subjective norm, attitude and perceived behavioral control toward purchasing green products positively shape green purchase intention. The same positive effect is also witnessed between green purchase intention and behavior. However, perceived behavioral control towards purchasing green products had no significant influence on green purchase behavior.

Practical implications – This study suggests that green marketers should promote environmental consciousness among consumers to influence and shape their planned behavior towards green purchases. This could be done by prioritizing efforts and investments in inculcating environmental values, followed by enhancing environmental knowledge and finally inducing environmental concern among consumers. Green marketers can also leverage subjective norm and perceptions of behavioral control toward purchasing green products to reinforce green purchase intention, which, in turn, strengthens green purchase behavior. This green marketing strategy should also be useful to address the intention–behavior gap as seen through the null effect of perceived behavioral control on purchase behavior toward green products when this strategy is present.

Originality/value – This study contributes to theoretical generalizability by reaffirming the continued relevance of the theory of planned behavior in settings concerning the environment (e.g. green purchases), and theoretical extension by augmenting environmental concern, environmental knowledge and environmental values with the theory of planned behavior, resulting in *an environmentally conscious theory of planned behavior*. The latter is significant and noteworthy, as this study broadens the conceptualization and operationalization of environmental consciousness from a unidimensional to a multidimensional construct.

Keywords Green consumption, Green product, Green purchase, Environmentally conscious, Environmental consciousness, Environmental concern, Environmental knowledge, Environmental values, Theory of planned behavior, Green attitude

Paper type Research paper

1. Introduction

The escalating urgency of environmental issues such as climate change in recent times has triggered a united response from individuals, governmental entities, non-governmental organizations

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and environmental agencies (Bhattacharyya *et al.*, 2022; Kumar *et al.*, 2021). These key stakeholders meticulously oversee the operational methods of corporations – spanning from manufacturing and packaging, through supply chain management, to waste disposal – to verify compliance with sustainable guidelines (Lim *et al.*, 2023a). However, the effectiveness of these environmental initiatives largely depends on the proactive adoption of sustainable practices by both industries and individual consumers (Lim, 2022). The COVID-19 pandemic has dramatically reshaped consumer behavior, with sustainability now serving as a cornerstone in their purchasing decisions (Cheung *et al.*, 2022; Lim *et al.*, 2023b; Rakuten Insights, 2022).

Drawing from the heightened sense of environmental responsibility outlined above, it becomes even more imperative to address the critical juncture at which we find ourselves – consumption has reached a tipping point. To grasp the gravity of this, consumption must be dissected from two standpoints: inputs and outputs. From an input perspective, the relentless use of our natural resources has led to their alarming depletion. Contrarily, from an output standpoint, the increasing waste (age) from consumption continues to catalyze environmental degradation at an unprecedented pace. Why is this tipping point so consequential? The recent red alert on climate change issued by the United Nations Framework Convention on Climate Change at the 26th session of the Conference of its Parties (COP26) starkly underscores the crisis we are embroiled in. Furthermore, our aspirations of meeting the United Nations Sustainable Development Goals by 2030 are not just stagnating, but sadly regressing, threatening to set us on a course for irrevocable failures (Lim, 2022). As evidence mounts, it is becoming increasingly clear that conventional solutions – be it anti-consumption movements advocating against excess consumption or de-consumption campaigns encouraging voluntary reduction – are not producing the desired outcomes. The hard truth remains: with a burgeoning global population, curbing overall consumption seems an insurmountable challenge. In addition, our collective ethos, in reality, leans towards doing (e.g. work) and wanting (e.g. income) more, not less – do employers want their employees to work less and do employees want less income? The answer, very likely, is a resounding no. The inherent nature of humans, rooted in both logical reasoning and psychological functioning, combined with the foundational principles of our growth-driven economy, inarguably amplifies our propensity for increased consumption. However, in the midst of this consumption conundrum, the silver lining is our increasing awareness about the environment. Consequently, the need of the hour is not just to control consumption, but to ardently promote pro-environmental behaviors, striking a balance that safeguards both our aspirations and the planet we live in (Lim, 2023).

The theory of planned behavior (TPB) (Ajzen, 1991), an extension of the theory of reasoned action (TRA) (Fishbein and Ajzen, 1975), with its inclusion of perceived behavioral control, has emerged as a pivotal theoretical framework for analyzing consumer behavior in environmental psychology (Mancha and Yoder, 2015; Moon *et al.*, 2021; Kumar *et al.*, 2017; Yuriev *et al.*, 2020). The TPB is predicated on the notion that an individual's action is guided by their intention, which is, in turn, influenced by attitude, perception of behavioral control and subjective norm (Ajzen, 1991). A rich body of research underscores the positive correlation between consumers' attitude and their intent to purchase green products (Mostafa, 2007a; Shin *et al.*, 2018). Other studies highlight subjective norm and perceived behavioral control as key predictors of green purchasing behavior (Chen, 2017; Khare, 2015; Park and Ha, 2012; Rahman and Reynolds, 2017; Shin *et al.*, 2018; Verma and Chandra, 2018). Indeed, the TPB has particular relevance in understanding green consumption behavior across product and service categories such as eco-friendly products (Khare, 2015), green hotels (Rahman and Reynolds, 2017; Verma and Chandra, 2018), organic food (Chen, 2017; Shin *et al.*, 2018) and recycling (Park and Ha, 2012), among others.

Despite the significant contributions of existing research on green consumer behavior and the TPB, a noteworthy gap exists. While the TPB has recently inspired the creation of contemporary indigenous theories like the theory of behavioral control (Lim and Weissmann, 2023) and the theory of financial planning behavior (Yeo *et al.*, 2023), its adaptability to environmentally influenced consumer behavior remains noticeably underexplored. Mancha and Yoder (2015), for instance, contextualized the TPB components: from attitude, subjective norm, perceived behavioral control and behavioral intention to green versions of the same (i.e. preservation attitude, green subjective norm, green perceived behavioral control and green behavioral intention). While they also incorporated facets of self-construal (i.e. independent versus interdependent), these variables do not inherently reflect the environment. This is echoed in the review by Yuriev *et al.* (2020), showing that many studies predominantly rely on non-environmental variables (e.g. anticipated emotions, habit, moral norm, past behavior, self-efficacy, self-identity and sense of community) to explain pro-environmental behaviors.

Recent scholars such as Moon *et al.* (2021) recognized the aforementioned gap, adopting the TPB and extending it through an environmental perceptual lens (i.e. perceived seriousness of environmental problems, perceived environmental responsibility and perceived effectiveness of environmental behavior). Their work affirms the importance of establishing environmentally focused theoretical lenses, a call echoed by other scholars (do Canto *et al.*, 2023; Lange, 2023). In line with this theoretical trajectory, the present study argues that enhancing the TPB to encompass environmental consciousness is vital for a comprehensive understanding of its influence on pro-environmental behaviors. The psychological underpinnings of this assertion are rooted in the profound impact that consciousness can have on shaping behaviors, wherein the heightened awareness of one's environment and the consequences of one's actions within that environment can catalyze intentional behaviors (Gupta *et al.*, 2023; Lim *et al.*, 2023c). This aligns with the central tenets of consumer psychology which posit that cognitions, in this case, consciousness about the environment, play a pivotal role in guiding behavior (Lim, 2017). As recent studies on consumer mindfulness suggest (Gupta *et al.*, 2023), individual action is deeply intertwined with one's consciousness about one's environment and the consequences of actions within it (Gupta and Sheth, 2023). Ignoring such an essential cognitive facet when examining consumer behaviors, especially those relating to the

environment, would inarguably result in an inadequate, incomplete and underdeveloped understanding of the issue. Thus, integrating environmental consciousness into the TPB not only adds depth and breadth to the theory but also ensures that the theory remains adaptive and relevant to the pressing environmental challenges of recent times.

In this research, a multidimensional approach to environmental consciousness has been adopted to probe its influence on the planned behavior for green products – a key pro-environmental behavior that offers a pragmatic solution to balancing consumption needs while mitigating their environmental impact (Lim, 2022). Historically, environmental consciousness has often been examined as a unidimensional concept (Ahmad *et al.*, 2020; Al Amin *et al.*, 2023; Jain *et al.*, 2020). However, a unidimensional perspective can be restrictive, potentially overlooking the nuanced layers of consumer behavior (Lim *et al.*, 2023b). Embracing a multidimensional approach enables us to capture the full spectrum of environmental consciousness, from emotional resonances and cognitive understandings to deep-seated values and resulting behaviors. Recognizing and dissecting these layers, we can achieve a more comprehensive understanding of the determinants and dynamics of green purchases. Such granularity is paramount in crafting effective strategies and interventions aimed at fostering sustainable consumer behaviors, as it takes into account the multifaceted considerations that consumers face in their decision-making processes. This study, therefore, seeks to bridge this research gap by proposing a more encompassing dimension of environmental consciousness.

In essence, consciousness has been viewed with affective and cognitive facets. The affective facet of consciousness pertains to the emotional connections, concerns and sentiments individuals harbor, capturing the depth of feelings and empathetic reactions they experience (Izard, 2009; Zahn-Waxler and Radke-Yarrow, 1990). On the other hand, the cognitive facet of consciousness relates to individuals' comprehension and understanding, thereby reflecting their informedness (Baars and McGovern, 1996; Rotstein *et al.*, 2012). Together, these facets provide a holistic understanding of how individuals perceive, feel and process information, shaping their attitudes and behaviors.

Within a multidimensional perspective of environmental consciousness, we categorize *environmental concern* under the affective facet because it embodies the emotions, feelings and sentiments individuals hold toward the environment, capturing their emotional connection to environmental well-being and the visceral reactions they have when confronted with environmental issues (Kennedy and Givens, 2019). Such concerns often serve as the emotional catalysts or triggers that spur them into action, wherein their affective response can be a powerful motivator, influencing their attitudes and eventual behaviors toward green products or practices (Pong and Tam, 2023). The cognitive facet, on the other hand, is embodied by *environmental knowledge*. Knowledge, by its very nature, involves the acquisition and assimilation of information (Cepeda-Carrion *et al.*, 2023). Environmental knowledge, therefore, pertains to an individual's understanding of environmental issues, causes, consequences and solutions, serving as a framework within which individuals interpret and make sense of environmental information, which, in turn, informs their beliefs and perceptions (Liu *et al.*, 2020).

Finally, we posit that *environmental values* represent a unique blend of the affective and cognitive facets of environmental consciousness. These values are deeply ingrained beliefs that individuals hold about the environment, forged by a combination of emotional attachments and informed understandings (Tamar *et al.*, 2021). They serve as guiding principles in one's life (Tan *et al.*, 2022), directing both thought processes (cognitive) and emotional reactions (affective) toward environmental issues (Koundouri *et al.*, 2023). Environmental values often act as the bridge between knowledge and concern (Saifulina *et al.*, 2023), harmonizing what one knows and feels about the environment into a cohesive worldview.

Integrating an environmentally conscious perspective into the TPB holds significant value for several reasons. First, environmental consciousness represents a critical component of modern-day consumer decision-making (Perera *et al.*, 2022). With the growing urgency of global environmental issues (Lim, 2022), more and more consumers are incorporating sustainability considerations into their purchase decisions (Sharma *et al.*, 2023). Hence, by embedding environmental consciousness within the TPB, we can enhance our understanding of consumer behavior in this changing landscape, making the theory more profound in explaining the contemporary realities of consumer behavior. Second, incorporating an environmentally conscious perspective to the TPB aligns with societal shifts towards more sustainable lifestyles and practices, reflecting an emerging societal value system that prioritizes environmental well-being and planetary health (Lim, 2023). Therefore, by extending the TPB to consider these values, we can improve the theory's explanatory relevance and predictive power. Third, an environmentally conscious TPB could serve as an instrumental tool for business strategists, marketers and policymakers. Understanding the impact of environmental consciousness on planned behavior can inform strategies aimed at promoting more sustainable consumer behaviors. For instance, this understanding can help in the design of more effective educational campaigns, marketing strategies or public policies promoting green products and behaviors. *Finally*, the inclusion of environmental consciousness into the TPB has the potential to catalyze new avenues of research. This extension to the TPB can enrich theoretical relevance across disciplines, including consumer behavior, environmental psychology and sustainability science. By providing a robust foundation for future investigations, the theoretical extension herein encourages a more comprehensive and interdisciplinary understanding of consumer behavior's role in sustainability. Thus, integrating an environmentally conscious perspective into the TPB not only enhances its existing framework but also inspires innovative exploration in related fields. Such a theoretical contribution would be instrumental in driving research into green consumer behavior, a topic of high relevance to the United Nations Sustainable Development Goals (e.g. SDG12 Sustainable Consumption and Production). This endeavor becomes even more critical given the detrimental impacts of COVID-19 on environmental and social well-being, which has posed unprecedented challenges and threatened to undo past progress (Lim, 2022).

Using green purchasing as our focus, we aim to examine consumers' buying behavior towards environmentally friendly products through an environmentally conscious perspective. Our approach is to adapt and enrich the TPB by

introducing three pivotal factors indicative of environmental consciousness: environmental concern, environmental knowledge and environmental values. Through this study, we develop *an environmentally conscious TPB*, an empirically grounded theoretical framework. This framework enhances the *theoretical generalizability* of the TPB by reaffirming its adaptability across various contexts, including green purchases, and engages in *theoretical extension* by incorporating the elements of environmental consciousness. The latter is noteworthy as environmental consciousness has traditionally been treated as a unidimensional rather than a multidimensional construct (Ahmad *et al.*, 2020; Jain *et al.*, 2020), thereby limiting understanding about how environmental consciousness actually manifests in reality. The multidimensional conceptualization and operationalization of environmental consciousness proposed and investigated herein equips academic scholars, industry practitioners and policymakers with a finer-grained understanding of this profound concept in environmental psychology for green marketing. Consequently, this study offers a holistic, environmentally conscious lens for interpreting and encouraging green purchasing behavior.

The remainder of this article is organized as follows: We first embark on an in-depth literature review to create a conceptual framework and establish relevant hypotheses for our study. This is followed by a detailed explanation of our research methodology, which includes a discussion on the instrumentation and sampling techniques employed. Subsequently, we present our study's findings and conclude with a discussion on the implications and limitations of our study alongside potential directions for future research.

2. Theoretical background and hypothesis development

2.1 Theory of planned behavior and environmental consciousness

Numerous studies explored environmental psychology to understand the antecedents of green buying behavior. Some of these studies highlighted the role of the TPB (Ajzen, 1991) as a framework for green buying behavior. The TPB suggests that attitude, subjective norm and perceived behavioral control affect a person's behavioral intention. The TRA, developed by Fishbein and Ajzen (1975), guides the TPB. According to the TRA, the individual intention of undertaking or not undertaking any behavioral activity is directly a factor of that behavior. Likewise, the subjective norm influences the individual intention behind a specific behavior. The TPB is an expansion of the TRA and can overcome the drawback of the incomplete control dimension of the original theory. The TPB has added a third variable – that is, perceived behavioral control – and attempts to explain the behavioral intention concerning the three abovementioned aspects that influence consumer behavior. Therefore, researchers have often adopted the TPB instead of the TRA to examine green buying behavior (Berki-Kiss and Menrad, 2022; Birgelen *et al.*, 2009; Kumar *et al.*, 2017; Mahon *et al.*, 2005; Yadav and Pathak, 2017; Zagata, 2012).

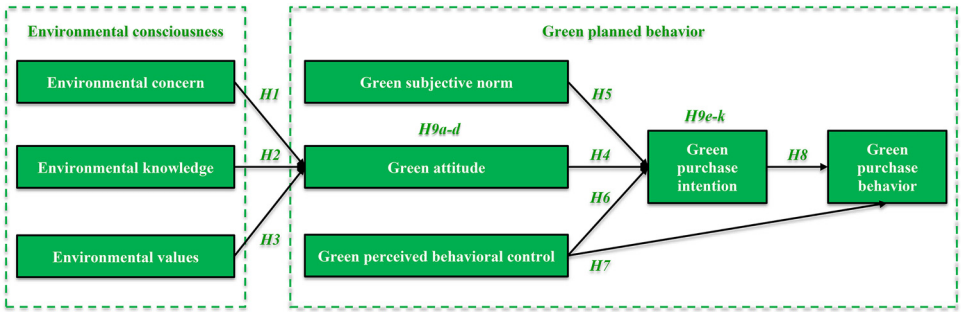
Recently, scholars have shown interest in exploring environmental consciousness as a concept that could manifest, albeit implicitly, through environmental concern (Chang and Su, 2022; Panda *et al.*, 2020), environmental knowledge (Patwary *et al.*, 2022; Zahan *et al.*, 2020) and environmental values (Ghose and Chandra, 2020). Environmental consciousness can be defined as beliefs that reflect the psychological influence of one's tendency to be involved in pro-environmental behavior (Zelezny and Schultz, 2000). Though the nuances of environmentally conscious consumer behavior are important (Sharma and Bansal, 2013), the concept has traditionally been explicitly stated and studied only as a unidimensional concept (Ahmad *et al.*, 2020; Jain *et al.*, 2020), implying that its multidimensional variant needs to be formally established and empirically tested to support its *theoretical legitimacy*. In this vein, the present study attempts to explore the environmental factors of environmental concern, environmental knowledge and environmental values as manifestations of environmental consciousness and investigate their association with green purchase behavior. Indeed, integrating the TPB with environmental factors can offer an encompassing perspective on green behavior among consumers.

The conceptual framework and hypotheses development are depicted in Figure 1. Within the scope of environmental consciousness and green purchasing behaviors, this research meticulously amalgamates several recognized relationships and introduces novel interactions and mediation effects. The relationships encompassed in *H1–H8*, while drawing insights from diverse contexts including green and non-green products, present them collectively under a unified conceptual framework. This integration, while having its roots in established findings, has not been holistically approached in prior research in the manner we have undertaken. Pushing the frontier of inquiry, we ventured further by integrating *H9a–H9k* into our framework. These hypotheses, representing both interaction and serial mediation effects, are unique and, to our best understanding, remain uncharted in extant literature. Amalgamating these recognized and novel hypotheses, we strive for a comprehensive understanding of the interplay between environmental consciousness and green behavior among consumers.

2.2 Environmental concern and green attitude

Environmental concern highlights *the intensity of people's general awareness about environmental problems and their willingness to minimize their impact*. Environmental concern is considered an essential dimension in understanding consumer behavior related to environmental awareness (consciousness), as evident from the marketing literature (Hines *et al.*, 1987; Prakash and Pathak, 2017; Roberts and Bacon, 1997; Straughan and Roberts, 1999). Environmental concern can also help minimize environmental issues at the individual level (Paul *et al.*, 2016; Prakash and Pathak, 2017). Research has also revealed that environmental concern notably affects consumers' attitudes (Laheri, 2020; Mostafa, 2007b) and intention to purchase green products (Panda *et al.*, 2020; Paul *et al.*, 2016) such as organic food (Pham *et al.*, 2019). Indeed, consumers accustomed to ecological issues have shown a positive attitude towards bio-based ingredients and tend to be prone to purchase environmentally friendly products (Sajinčič *et al.*, 2021). With the rising concern regarding the environment, consumers have exhibited a positive attitude towards environmentally friendly products (Sheng *et al.*, 2019). Accordingly:

Figure 1 An environmentally conscious theory of planned behavior



Source: Authors' own illustration

H1. Environmental concern positively influences consumers' attitude towards purchasing green products.

2.3 Environmental knowledge and green attitude

Environmental knowledge is *general knowledge of facts, concepts and relationships concerning the natural environment and its major ecosystem* (Fryxell and Lo, 2003), thereby reflecting *one's knowledge of environmental issues* (Sánchez and Lafuente, 2010). Chen *et al.* (2011) examined the knowledge of air passengers regarding environmental issues and found that such knowledge enables them to develop a pro-environmental attitude towards air travel. Recent findings have also shown that green image stimulates consumers and knowledge of this image inspires their attitude towards the environment and green products (Le *et al.*, 2021). With time, consumers' interest and knowledge in green products have been augmented, which has led to the development of a positive standpoint towards green products (Tandon *et al.*, 2020). Consumers' knowledge of green packaging has also been evidenced to directly affect their intention to purchase green products (Moorthy *et al.*, 2021). While environmental knowledge impacts on consumers' intent to make green purchases (Zahan *et al.*, 2020), the lack of thereof acts as a barrier that can lead to the development of a gap between consumers' attitude towards green products and purchasing them (Sharma, 2021). Hence:

H2. Environmental knowledge positively influences consumers' attitude towards purchasing green products.

2.4 Environmental values and green attitude

Consumers' values reflect *deeply ingrained beliefs shaped by emotional attachments and informed understandings* (e.g. about the environment or pro-environmental practices) (Tamar *et al.*, 2021). These values have gained significant attention in measuring environmentally conscious consumer behavior (Asif *et al.*, 2018; Cheah and Phau, 2011; Pauw and Petegem, 2013; Vermeir and Verbeke, 2008; Yue *et al.*, 2021). Numerous studies support the vital role of consumers' values in influencing their attitude towards purchasing green products (Ghose and Chandra, 2020; Krystallis *et al.*, 2008; Schlegelmilch *et al.*, 1996; Urien and Kilbourne, 2011; Vermeir and Verbeke, 2008). Consumers' self-enhancement and generativity values directly influence their attitude and intention for sustainable consumption behavior (Urien and Kilbourne, 2011). Individual and societal values have been found to exert an affirmative effect on consumers' attitude towards purchasing green products (Hur *et al.*, 2015), reaffirming that environmental values are a crucial determining factor behind consumers' green purchase behavior (Cheung and To, 2019). In this regard:

H3. Environmental values positively influence consumers' attitude towards purchasing green products.

2.5 Green attitude

Attitude refers to the *positive or negative evaluation of performance associated with a person's typical behavior* (Ajzen, 1991), wherein its green manifestation is a reflection one's evaluation of a subject (e.g. product or practice) relating to the environment (e.g. green product or practice). Consumers' attitude towards green products has an affirmative relationship with purchase intention across different product categories. For organic food products, studies have observed a significant association between attitude and purchase intention (Zagata, 2012; Zhou *et al.*, 2013). Similar results are found for beverages (Birgelen *et al.*, 2009), energy-efficient products (Durif *et al.*, 2012), organic personal care products (Kim and Sin, 2011), hospitality (Han and Yoon, 2015; Manaktola and Jauhari, 2007) and tourism (Barber *et al.*, 2010). Given that consumer attitudes are directly associated with consumer engagement with green products (Costa *et al.*, 2021; Khare, 2015; Moorthy *et al.*, 2021; Visser and Dlamini, 2021; Yadav and Pathak, 2017), this study proposes that:

H4. Consumers' attitude towards purchasing green products positively influences their intention to purchase such products.

2.6 Green subjective norm

Ajzen (1991) defined subjective norm as *the degree of social pressure a person feels about the behavior*, and when applied to a scenario or setting involving the environment, this norm pertains to *societal expectations on green behaviors* (e.g. green purchases). Prior studies have reported a positive relationship between social exchange among family, friends, peers and

relatives and the purchase of green products (Arvola *et al.*, 2008; Dean *et al.*, 2012; Mahon *et al.*, 2005; Teng *et al.*, 2014). While Khare (2015) and Paul *et al.* (2016) have reported no association between societal norms and buying behavior for green products, on the contrary, Yadav and Pathak (2017) reported that subjective norm is positively associated with the intent to purchase green products. In this regard, the literature is inconsistent in reporting this relationship, necessitating further investigation. Given that the latter is more recent, this study postulates in that direction, whereby:

H5. Subjective norm towards purchasing green products positively influences consumers' intention to purchase such products.

2.7 Green perceived behavioral control

Ajzen (1991) states that perceived behavioral control refers to *the individual's perception of the possible difficulties when performing a specific behavior,* and when applied to a scenario or setting involving the environment, this perception relates to *possible difficulties of performing green behaviors* (e.g. green purchases). Perceived behavioral control, as one of the constructs of the TPB, attempts to predict behavioral intention beyond control beliefs. The exploration of the literature has shown that perceived behavioral control is a strong predictor of purchase intention and purchase behavior for green products (Bamberg and Möser, 2007; Paul *et al.*, 2016; Teng *et al.*, 2014; Tonglet *et al.*, 2004; Thogersen, 2007; Yadav and Pathak, 2017). Hence:

H6. Perceived behavioral control of purchasing green products positively influences consumers' purchase intention towards such products.

H7. Perceived behavioral control of purchasing green products positively influences consumers' purchase behavior towards such products.

2.8 Green purchase intention and behavior

According to Kaiser *et al.* (1999), intention is seen as *a precursor of behavior.* Ajzen (1991) assumed intention to be a key factor in predicting an individual's behavior. Researchers have adapted the TPB to predict pro-environmental behavior, which encapsulates behavior such as using earth-friendly/environment-friendly/green products, recycling, waste disposal activities, saving electricity, consuming less meat, regular servicing of vehicles and many more. Prior studies have shown that the TPB has been used widely to examine the influence of purchase intention on the purchase behavior of energy-efficient products (Ha and Janda, 2012), green restaurants (Chou *et al.*, 2012; Chen, 2017) and green products (Jaiswal *et al.*, 2021; Mamun *et al.*, 2020; Yadav and Pathak, 2017). Therefore:

H8. Consumers' purchase intention of green products positively shapes their purchase behavior towards such products.

2.9 Interaction and serial mediation effects

Building on the above understanding on consumers' attitude towards purchasing green products, the interaction between various dimensions of environmental consciousness becomes paramount. Environmental knowledge, which encompasses the awareness and comprehension individuals hold regarding environmental issues (Liu *et al.*, 2020), can act synergistically with environmental concern, the emotional importance individuals assign to these issues (Kennedy and Givens, 2019). We posit that one who is both well-informed and deeply concerned about the environment might be more inclined to foster positive green attitudes. Moreover, when these elements align with environmental values – those inherent beliefs individuals place on the environment – it might further intensify one's green attitude. This suggests that not only could a combination of knowledge and concern, or values and concern, amplify green attitudes, but a triadic interaction of knowledge, concern and values might offer a holistic and potent perspective towards the purchasing of green products. Based on these considerations, the following hypotheses are posited: the interaction between environmental knowledge and concern, values and concern and values and knowledge, each positively influences the attitude towards purchasing green products. Furthermore, a three-way interaction among knowledge, concern and values is anticipated to exert an even more pronounced influence on this attitude. Hence:

H9a. The interaction between environmental knowledge and environmental concern positively influences consumers' attitude towards purchasing green products.

H9b. The interaction between environmental values and environmental concern positively influences consumers' attitude towards purchasing green products.

H9c. The interaction between environmental values and environmental knowledge positively influences consumers' attitude towards purchasing green products.

H9d. The three-way interaction between environmental concern, environmental knowledge and environmental values positively influences consumers' attitude towards purchasing green products.

Serial mediation often unveils the sequential mechanisms through which independent variables impact outcomes (Yap *et al.*, 2023). In green consumption, one's environmental concern, knowledge or values could prime a positive attitude towards green products. This formed attitude, serving as an initial mediator, might then guide the intention to purchase green products. The continuum is projected to result in the actual green purchase behavior, establishing a sequential mediating path in line with the TPB (Ajzen, 1991). For instance, heightened environmental concern might engender positive attitude towards purchasing green products (Laheri, 2020; Mostafa, 2007b), which in turn could lead to a firm intention to buy, finally translating to actual purchase behavior (Panda *et al.*, 2020; Paul *et al.*, 2016). Similarly, the interplay of different facets of environmental consciousness, such as the interaction of knowledge and concern or values and concern, can further modulate this serial mediation pathway. Moreover,

the interplay of all three facets – knowledge, concern and values – is proposed to offer the most holistic influence in this serial mediation process, considering their comprehensive role in shaping environmental perceptions. Hence, it is hypothesized that the interaction effects of environmental concern, knowledge and values on green purchase behavior are sequentially mediated by consumers' attitude and purchase intention toward green products. Thus:

H9e. Environmental concern influences green purchase behavior through a serial mediation of consumers' attitude and purchase intention toward green products.

H9f. Environmental knowledge influences green purchase behavior through a serial mediation of consumers' attitude and purchase intention toward green products.

H9g. Environmental values influence green purchase behavior through a serial mediation of consumers' attitude and purchase intention toward green products.

H9h. The interaction between environmental knowledge and environmental concern influences green purchase behavior through a serial mediation of consumers' attitude and purchase intention toward green products.

H9i. The interaction between environmental values and environmental concern influences green purchase behavior through a serial mediation of consumers' attitude and purchase intention toward green products.

H9j. The interaction between environmental values and environmental knowledge influences green purchase behavior through a serial mediation of consumers' attitude and purchase intention toward green products.

H9k. The three-way interaction between environmental concern, environmental knowledge and environmental values influences green purchase behavior through a serial mediation of consumers' attitude and purchase intention toward green products.

3. Methodology

3.1 Instrumentation

The measurement items for this study were taken from validated scales in the literature. Based on the study's requirements, the necessary modification was incorporated. A three-item scale for environmental concern and environmental knowledge by Kaiser *et al.* (1999) and Minton and Rose (2015) along with a four-item scale for environmental values by Bouman *et al.* (2021) were adapted. In addition, three-item scales for green attitude and green subjective norm were adapted from Sharma and Gadenne (2014) and Chen (2017). A three-item scale for green perceived behavioral control by Sparks and Shepherd (1992) was also adapted. Finally, a four-item scale for green purchase intention and a three-item scale for green purchase behavior were adapted from Bolton and Drew (1991) and Schlegelmilch *et al.* (1996). The initial adaptation of existing scales served as a starting point for in-depth discussion among four experts (i.e. two from academic and two from industry) that led to improvements as part of a *pretest* to establish *content validity*.

3.2 Sampling

Cluster sampling was conducted to collect data from consumers in the Delhi-NCR region. As Delhi is the capital of India, it has a combination of different cultures, languages, lifestyles and traditions because of migration from all areas of India. The capital is also the second most populous city in the world. The population was divided into nine different clusters based on the districts of Delhi-NCR: North, South, East, West, North-west, North-east, Central, New Delhi and South-west, as per National Informatics Centre, India. In each district, shopping malls with retail stores offering both green and non-green products were selected using a simple random sampling technique. Before distributing the paper-and-pencil questionnaire, potential respondents were preliminarily asked: "Are you aware of the term green products?" This screening was implemented to ensure participants had a foundational understanding of the subject, facilitating more informed and relevant responses. The data was initially collected from 30 consumers and tested through a *pilot study* to establish *face validity*, leading to a few minor modifications to improve the clarity and reduce the complexity of questions before the final questionnaire was administered to the main sample. No incentives were given, and participation in the study was entirely voluntary.

4. Results

4.1 Profile of participants

The demographic profile of participants is presented in Table 1. Majority were female, aged between 25 and 40 years, had a monthly family income above $700 and predominantly graduates.

4.2 Measurement model

Confirmatory factor analysis was conducted using maximum likelihood estimation in AMOS. The measurement model

Table 1 Demographic profile ($n = 410$)

Demographic	Frequency	%
Gender		
Female	265	64.7
Male	145	35.3
Age		
Below 25 years	131	32
25 to 40 years	242	59
41 to 55 years	25	6
Above 55 years	12	3
Monthly family income (in US$)		
Below $300	62	15
$301 to $500	86	21
$501 to $700	94	23
Above $700	168	41
Education		
High school	62	15
Graduate	185	45
Postgraduate	163	39

Source: Authors' own illustration

established the proposed model constructs' convergent and discriminant validity and reliability. The goodness of fit was examined using different indicators and thresholds: chi-square (χ^2) with a degree of freedom below three, root mean residual (RMR) below 0.05, goodness of fit index (GFI) above 0.90, adjusted GFI (AGFI) above 0.80 and root mean square error of approximation (RMSEA) of 0.08 and below (Hair *et al.*, 2015; Wang *et al.*, 2019; Zong *et al.*, 2023). Given that χ^2/df was 2.042, RMR was 0.047, GFI was 0.901, AGFI was 0.872 and RMSEA was 0.050, the measurement model was deemed to be acceptable.

Factor loadings (FL), composite reliability (CR), average variance extracted (AVE) and Cronbach's α values are presented in Table 2. The internal consistency of constructs was represented by Cronbach's α values, which were above the threshold of 0.70 (Hair *et al.*, 2015). The CR values were between 0.743 and 0.836 (i.e. above 0.70 threshold), whereas the AVE values were between 0.501 and 0.631 (i.e. above 0.50 threshold) and the standardized FL for items were between 0.503 and 0.851 (i.e. above 0.50 threshold) in line with Hair *et al.* (2015). In this regard, convergent validity was affirmed through AVE and FL while reliability was established via using Cronbach's α and CR, whereas the discriminant validity assessment relies on the measurement model information in Table 3, wherein the square root of AVE was greater than the correlation between constructs and thus showing the presence of discriminant validity (Hair *et al.*, 2015).

4.3 Structural model

The model fit indices of the structural model demonstrated a good model fit: χ^2/df was 2.087, RMR was 0.058, GFI was 0.901, AGFI was 0.868 and RMSEA was 0.052 (Hair *et al.*, 2015). In this regard, the hypothesized model can proceed for testing using path analysis. The standardized regression estimates and p-values were assessed to examine the effect of exogenous on endogenous variables. The results are represented in Table 4.

The results of the path analysis for the structural model indicate that all hypotheses were supported, except *H7*. In particular, environmental values (*H3*) were found to be the most significant predictor of consumers' attitude towards purchasing green products ($\beta = 0.343$ and $p < 0.01$), followed by environmental knowledge (*H2*) ($\beta = 0.174$ and $p < 0.05$) and environmental concern (*H1*) ($\beta = 0.150$ and $p < 0.05$). In addition, the results showed that consumers' attitude (*H4*) was the strongest antecedent prompting their intention to purchase green products ($\beta = 0.411$ and $p < 0.01$), followed by perceived behavioral control (*H6*) ($\beta = 0.320$ and $p < 0.01$) and subjective norm (*H5*) ($\beta = 0.253$ and $p < 0.01$). Moreover, purchase intention (*H8*) also shaped purchase behavior for green products positively among consumers ($\beta = 0.463$ and $p < 0.01$). Nevertheless, no significant effect was found for consumers' perception of behavioral control (*H7*) and their purchase of green products ($\beta = -0.059$ and $p = 0.397$).

Additional analyses were carried out to provide a more detailed understanding of the interactions between the environmental factors reflecting environmental consciousness. Given the prevalent concern over consumers' continued ignorance and lack of awareness regarding environmental issues (Lim, 2022), a two-way interaction analysis was performed. This analysis aimed to examine the influence of environmental knowledge and environmental values on the relationship between consumers' environmental concern and their attitude towards purchasing green products. The underlying premise is that consumers with a deeper understanding of environmental issues, coupled with values aligned with environmental well-being, are likely to exhibit greater environmental concern. Consequently, these consumers are anticipated to exhibit more positive attitudes toward purchasing green products. The results of this analysis presented in Figure 2 and Table 5 highlight several noteworthy observations, supporting *H9a–H9k*.

First, Panel A of Figure 2 indicates that environmental knowledge positively interacts with the relationship between consumers' environmental concern and their attitude towards purchasing green products ($\beta = 0.0841$ and $p < 0.01$). Specifically, as environmental knowledge increases, the impact of consumers' environmental concern on their attitude towards purchasing green products is enhanced. Hence, environmental knowledge amplifies the positive relationship between environmental concern and the attitude towards green product purchases.

Second, Panel B of Figure 2 reveals that environmental values also have a positive interaction with the relationship between consumers' environmental concern and their attitude towards purchasing green products ($\beta = 0.1129$ and $p < 0.001$). The influence of environmental concern on attitude intensifies as environmental values become more pronounced. Therefore, environmental values reinforce the positive relationship between environmental concern and the attitude towards green product purchases.

Third, the influence of environmental values ($\beta = 0.1129$ and $p < 0.001$) seems to be more potent than that of environmental knowledge ($\beta = 0.0841$ and $p < 0.01$), confirming the structural model results in the main analysis. This suggests that individuals' held beliefs exert a stronger effect on their attitude towards purchasing green products than the knowledge they possess. Panel C of Figure 2 demonstrates that environmental values positively interact with the relationship between consumers' environmental knowledge and their attitude towards purchasing green products ($\beta = 0.1050$ and $p < 0.05$). As environmental values become more dominant, the impact of environmental knowledge on attitude is elevated. Consequently, environmental values bolster the positive relationship between environmental knowledge and the attitude towards green product purchases.

Further scrutiny of interaction effects in Table 5 shows that the presence of all three environmental factors reflecting environmental consciousness – that is, environmental concern, environmental knowledge and environmental values – yields the strongest impact on consumers' attitude toward purchasing green products ($\beta = 0.1131$ and $p < 0.001$). The table reveals that the serial mediation effects involving the various combinations of environmental consciousness, attitude, intention and behavior toward green product purchases are significant, thereby signaling the presence of complementary mediation while reaffirming the parsimony and predictive power of the *environmentally conscious TPB*.

5. Discussion and conclusion

5.1 Theoretical implications

The present study extends the TPB of Ajzen (1991) by integrating the environmental factors reflecting environmental

Table 2 Measurement items

Construct	Item	Loading	AVE	Cronbach's α	CR	Source
Environmental concern (EC)	EC1: I am concerned about using plastic as it is not biodegradable	0.835	0.503	0.740	0.747	Kaiser *et al.* (1999)
	EC2: I am concerned about paper waste as it fills up landfills	0.717				
	EC3: I am concerned about pollution as it produces contamination	0.545				
Environmental knowledge (EK)	EK1: I know about environmental problems	0.727	0.519	0.764	0.764	Minton and Rose (2015)
	EK2: I know about environmental responsibilities	0.711				
	EK3: I know how to reduce environmental problems	0.725				
Environmental values (EV)	EV1: I embrace altruistic values (e.g., treat others equally)	0.632	0.504	0.750	0.758	Bouman *et al.* (2021)
	EV2: I embrace biospheric values (e.g., care about nature)	0.712				
	EV3: I do not embrace egoistic values (e.g., important to be rich)	0.613				
	EV4: I do not embrace hedonic values (e.g., important to be spoilt)	0.690				
Green attitude (GATT)	GATT1: I like the idea of purchasing green products	0.771	0.524	0.741	0.760	Sharma and Gadenne (2014)
	GATT2: I feel good about the idea of purchasing green products	0.850				
	GATT3: I think purchasing green products is a good idea	0.506				
Green subjective norm (GSN)	GSN1: If I have little information about green products, I ask my friends for more information before making a purchase	0.660	0.607	0.808	0.821	Chen (2017)
	GSN2: I consult other people in selecting the best alternative from various green products	0.851				
	GSN3: I discuss about green products with my family and friends before purchasing	0.814				
Green perceived behavioral control (GPBC)	GPBC1: I find fewer green products available than non-green products	0.832	0.501	0.727	0.743	Sparks and Shepherd (1992)
	GPBC2: I find green products in fewer product categories than non-green products	0.746				
	GPBC3: I find it more challenging to find green products than non-green products	0.503				
Green purchase intention (GPI)	GPI1: I am keen to purchase green products	0.714	0.512	0.769	0.770	Bolton and Drew (1991)
	GPI2: I am keen to search for green products	0.596				
	GPI3: I am keen to choose green products over non-green products	0.670				
	GPI4: I am keen to switch to green products from non-green products	0.718				
Green purchase behavior (GPB)	GPB1: I have purchased green products with certification labels	0.775	0.631	0.831	0.836	Schlegelmilch *et al.* (1996)
	GPB2: I have compared brands of green products before purchasing	0.883				
	GPB3: I have purchased green products recently	0.715				

Notes: CR = Composite reliability; AVE = Average variance extracted; EC = Environmental concern; EK = Environmental knowledge; EV = Environmental values; GATT = Green attitude reflecting the attitude towards purchasing green products; GSN = Green subjective norm reflecting the subjective norm towards purchasing green products; GPBC = Green perceived behavioral control reflecting the perceived behavioral control towards purchasing green products; GPI = Green purchase intention reflecting the intention to purchase green products; and GPB = Green purchase behavior reflecting the actual purchase of green products

Source: Authors' own illustration

Table 3 Correlation matrix

Construct	GPI	EC	EV	EK	GATT	GSN	GPBC	GPB
GPI	*0.715*							
EC	0.397	*0.709*						
EV	0.429	0.519	*0.709*					
EK	0.318	0.457	0.470	*0.720*				
GATT	0.572	0.381	0.468	0.362	*0.724*			
GSN	0.448	0.203	0.326	0.104	0.233	*0.779*		
GPBC	0.542	0.312	0.353	0.338	0.444	0.332	*0.708*	
GPB	0.433	0.137	0.319	0.213	0.280	0.170	0.189	*0.794*

Notes: Diagonal figures are square roots of AVE, while regular figures are correlations between constructs. EC = Environmental concern; EK = Environmental knowledge; EV = Environmental values; GATT = Green attitude reflecting the attitude towards purchasing green products; GSN = Green subjective norm reflecting the subjective norm towards purchasing green products; GPBC = Green perceived behavioral control reflecting the perceived behavioral control towards purchasing green products; GPI = Green purchase intention reflecting the intention to purchase green products; and GPB = Green purchase behavior reflecting the actual purchase of green products
Source: Authors' own illustration

consciousness in terms of environmental concern, environmental knowledge and environmental values to predict green purchase among consumers. Some studies have examined the antecedents of attitude towards green products (Jaiswal and Kant, 2018; Khare, 2015; Wei *et al.*, 2017), but the majority have focused on examining the impact of attitude on the intention of purchasing green products (Yadav and Pathak, 2017; Zagata, 2012; Zhou *et al.*, 2013;). Few studies have scrutinized the impact of environmental concern and environmental knowledge while environmental values remain relatively understudied from a marketing standpoint (Jaiswal and Kant, 2018; Moorthy *et al.*, 2021; Panda *et al.*, 2020). Moreover, these multidimensional elements of environmental consciousness are often examined independently, while environmental consciousness as a concept tends to be studied in a unidimensional rather than a multidimensional form (Ahmad *et al.*, 2020; Al Amin *et al.*, 2023; Jain *et al.*, 2020). More importantly, though the TPB has been widely used to examine green buying behavior (Amoako *et al.*, 2020; Birgelen *et al.*, 2009; Kumar *et al.*, 2017; Mahon *et al.*, 2005; Yarimoglu and Gunay, 2019), the present study differentiates itself by establishing environmental consciousness as a multidimensional concept and linking the environmental factors relating to environmental consciousness in the form of environmental concern, environmental knowledge and environmental values to the TPB, leading to *an environmentally conscious TPB*, a result that contributes to the *theoretical extension of the TPB to reflect environmental nuances*.

Upon detailed scrutiny, it is observed that environmental values are the strongest predictor of consumers' attitude towards purchasing green products, followed by environmental knowledge and environmental concern, which, in turn, highlight the strength of the value system of individuals over their knowledge and concern. This is a noteworthy finding as it shows a clear thread in prioritization through the strength in effect of environmental consciousness in shaping consumer behavior – that is, concern → knowledge → values – whereby a concern could act as a trigger to green purchase (e.g. immediate, impulse – short term), whereas knowledge may facilitate informed search, selection, and purchase of green products (e.g. compare and contrast – longer term), while values motivate consumers to embrace green products and make them the preferred choice in their purchases (e.g. conviction – long term). They can also leverage subjective norm and perceptions of behavioral control to induce green purchase intention, which, in turn, motivates green purchase behavior, thereby reaffirming the *theoretical generalizability of the TPB in settings concerning the environment*.

Table 4 Direct effects

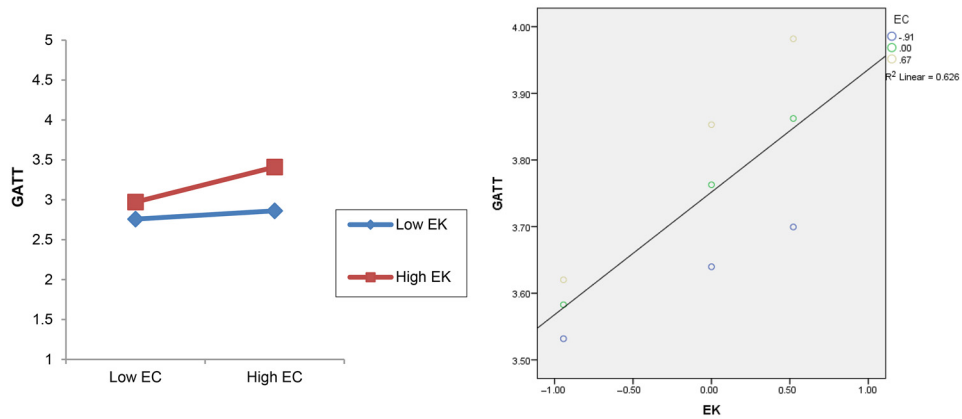
Relationship	Standardized beta (β)	Outcome
***H1*. EC→GATT**	0.150*	Supported
***H2*. EK→GATT**	0.174**	Supported
***H3*. EV→GATT**	0.343***	Supported
***H4*. GATT→GPI**	0.411***	Supported
***H5*. GSN→GPI**	0.253***	Supported
***H6*. GPBC→GPI**	0.320***	Supported
***H7*. GPBC→GPB**	−0.059	Not supported
***H8*. GPI→GPB**	0.463***	Supported

Notes: EC = Environmental concern; EK = Environmental knowledge; EV = Environmental values; GATT = Green attitude reflecting the attitude towards purchasing green products; GSN = Green subjective norm reflecting the subjective norm towards purchasing green products; GPBC = Green perceived behavioral control reflecting the perceived behavioral control towards purchasing green products; GPI = Green purchase intention reflecting the intention to purchase green products; and GPB = Green purchase behavior reflecting the actual purchase of green products
Source: Authors' own illustration

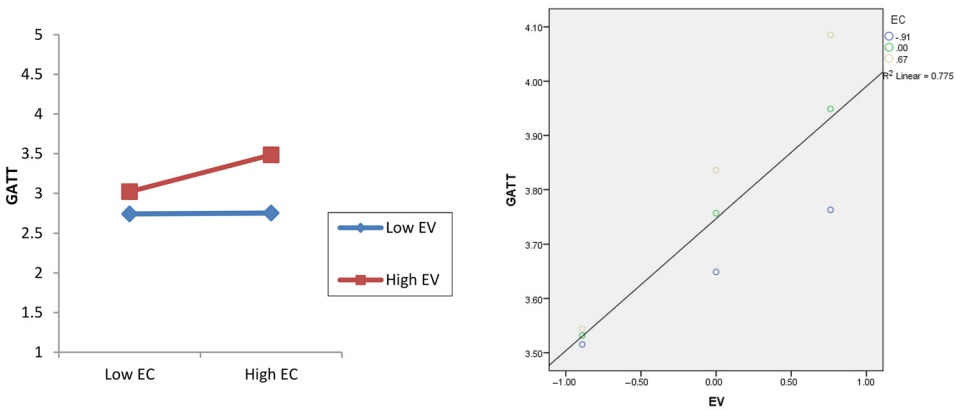
The final interesting observation seems to revolve around perceived behavioral control. Indeed, perceived behavioral control is deemed to be the hallmark of the TPB (Ajzen, 1991), serving as an explanatory factor of the infamous intention–behavior gap. In particular, the intention–behavior gap is a prevalent issue in consumer behavior, especially in green and sustainable consumption (Lim, 2022; Lim and Weissmann, 2023). In this study, it is observed that perceived behavioral control exerts a positive influence on green purchase intention while producing no significant effect on green purchase behavior. Contrary to expectation, consumers who perceive the presence of behavioral control seem to become more motivated

Figure 2 Interaction effect

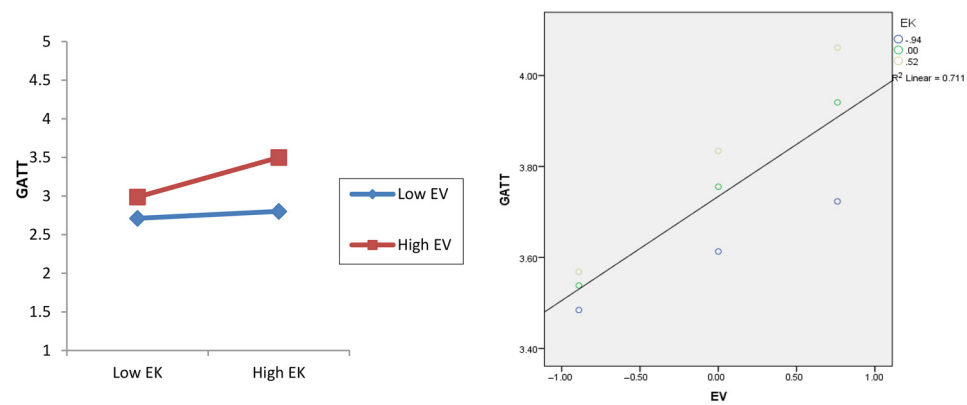
Panel A. The effect of environmental knowledge on the relationship between environmental concern and attitude towards purchasing green products



Panel B. The effect of environmental values on the relationship between environmental concern and attitude towards purchasing green products



Panel C. The effect of environmental values on the relationship between environmental knowledge and attitude towards purchasing green products



Source: Authors' own illustration

to seek out green products, as seen through the positive effect of the former on the latter. Interestingly, the rare effect of perceived behavioral control observed through this study, which, unlike other studies, had considered the concurrent presence of environmental factors that reflect environmental consciousness through environmental concern, environmental knowledge and environmental values in the same proposed and tested model (Figure 1). Upon detailed scrutiny (Table 2), it was observed that perceived behavioral control was operationalize using overt (external) (e.g. accessibility and availability) rather than covert (internal) (e.g. self-efficacy) controls (Lim and Weissmann, 2023). When these observations are taken collectively, it could be deduced that the presence of environmental consciousness through environmental concern, environmental knowledge and environmental values could provide consumers with confidence to overcome overt controls.

Table 5 Interaction and serial mediation effects

Panel A. Interaction effect	*Standardized beta (β)*	*p-value*	*LLCI*	*ULCI*	*Outcome*
H9a. EK × EC→GATT	0.0841**	0.0049	0.0256	0.1425	Interaction is present
H9b. EV × EC→GATT	0.1129***	0.0001	0.0552	0.1705	Interaction is present
H9c. EV × EK→GATT	0.1050***	0.0002	0.0505	0.1595	Interaction is present
H9d. EC × EK × EV→GATT	0.1131**	0.0040	0.0362	0.1900	Interaction is present

Panel B. Serial mediation effect	*Direct effect*	*Indirect effect*	*Sobel test*	*Outcome*
H9e. EC→GATT→GPI→GPB	$\beta = 0.0356$, LLCI = −0.0543, ULCI = 0.1255	$\beta = 0.0854$, LLCI = 0.0419, ULCI = 0.1336	$t = 2.53$, $p = 0.011$	Complementary mediation
H9f. EK→GATT→GPI→GPB	$\beta = 0.0712$, LLCI = −0.0145, ULCI = 0.1568	$\beta = 0.0622$, LLCI = 0.0233, ULCI = 0.1067	$t = 2.09$, $p = 0.035$	Complementary mediation
H9g. EV→GATT→GPI→GPB	$\beta = 0.0840$, LLCI = −0.0083, ULCI = 0.1763	$\beta = 0.0886$, LLCI = 0.0433, ULCI = 0.1378	$t = 2.58$, $p = 0.009$	Complementary mediation
H9h. EK × EC→GATT→GPI→GPB	$\beta = 0.0958$, LLCI = −0.0136, ULCI = 0.2053	$\beta = 0.1108$, LLCI = 0.0581, ULCI = 0.1759	$t = 2.68$, $p = 0.007$	Complementary mediation
H9i. EV × EC→GATT→GPI→GPB	$\beta = 0.2011$, LLCI = −0.0698, ULCI = 0.3324	$\beta = 0.1576$, LLCI = 0.0844, ULCI = 0.2482	$t = 2.72$, $p = 0.006$	Complementary mediation
H9j. EV × EK→GATT→GPI→GPB	$\beta = 0.0265$, LLCI = −0.1422, ULCI = 0.0893	$\beta = 0.1363$, LLCI = 0.0751, ULCI = 0.2017	$t = 2.94$, $p = 0.003$	Complementary mediation
H9k. EC × EK × EV→GATT→GPI→GPB	$\beta = 0.1561$, LLCI = −0.0074, ULCI = 0.3195	$\beta = 0.2214$, LLCI = 0.1241, ULCI = 0.3200	$t = 3.144$, $p = 0.001$	Complementary mediation

Notes: $^{***}p < 0.001$, $^{**}p < 0.01$ and $^{*}p < 0.05$. LLCI = Lower limit confidence interval; ULCI = Upper limit confidence interval; EC = Environmental concern; EK = Environmental knowledge; EV = Environmental values; GATT = Green attitude reflecting the attitude towards purchasing green products; GSN = Green subjective norm reflecting the subjective norm towards purchasing green products; GPBC = Green perceived behavioral control reflecting the perceived behavioral control towards purchasing green products; GPI = Green purchase intention reflecting the intention to purchase green products; and GPB = Green purchase behavior reflecting the actual purchase of green products. Interaction effect was determined using Hayes Process Macro (Model 1), while serial mediation effect was established via Hayes Process Macro (Model 6) (Hayes, 2017)
Source: Authors' own illustration

This deduction is also further supported and thus reaffirmed by the non-significant finding between perceived behavioral control and green purchase behavior, showing that perceived behavioral control does not impede behavioral performance and, thus, does not create nor lead to the infamous intention–behavior gap. In this regard, just by being present, environmental consciousness seems to have played a profound role in addressing and nullifying the intention–behavior gap that typically impedes green purchases, thereby highlighting a potential breakthrough in understanding planned behavior among consumers in settings concerning the environment.

5.2 Managerial implications

This study provides empirical evidence underscoring the critical role of environmental consciousness in nurturing positive consumer attitude towards the purchase of green products. The findings reaffirm the paramount influence of environmental values as the strongest predictor of consumers' attitude toward green product purchases. Environmental knowledge and environmental concern also significantly contribute, albeit to a lesser extent, as compared to environmental values. As such, green marketers aiming to positively shape consumer attitude towards eco-friendly purchases should prioritize their efforts and resources in fostering environmental values. This could involve championing altruistic ideals like equality and respect for others and biospheric values emphasizing care for nature. At the same time, green marketers should discourage egoistic tendencies, such as the pursuit of wealth, and hedonistic impulses, such as the desire for indulgence. Following this, the focus can shift to enhancing environmental knowledge. Green marketers can raise awareness about pressing environmental issues, individual responsibilities in preserving the environment and potential solutions to current environmental crises. Moreover, initiatives should be taken to instill environmental concern among consumers, such as education on the harmful effects of practices like excessive plastic use, paper waste and greenhouse gas emissions.

This study also equips green marketers with insights to refine their communication strategies, targeting consumers more effectively. The results herein – as seen in Table 5 – underscore that consumers' attitude towards purchasing green products can be significantly swayed when factors of environmental consciousness – namely, environmental concern, environmental knowledge and environmental values – are jointly leveraged. Green marketers, in their promotional campaigns, should emphasize the repercussions of escalating carbon footprints, surging air pollution and global warming to heighten consumer concern over environmental degradation. Subsequently, campaigns can resonate with consumers by emphasizing the symbiotic relationship between humans and nature, underscoring our dependence on the planet's health. Finally, leveraging visual cues such as green logos (indicating recycled materials) and certifications (like USDA organic, halal or energy star) on products can elevate consumer awareness and knowledge.

Therefore, by integrating environmental concern, knowledge and values, marketers can effectively shape positive attitude towards green product purchases.

5.3 Limitations and future research directions

Despite its contributions, the study remains limited in several ways, which could pave the way for further research. First, this study is limited to green purchase as a setting concerning the environment and thus future research could explore alternatives for such settings, for example, green consumption. Second, this study is limited to evidence from a developing country in Asia, and thus, future research could explore the generalizability of the *environmentally conscious TPB* in other developing and developed countries. Third, this study is limited to a cross-sectional design, and thus, future research could embark on experimentation to elevate the strength of evidence from correlational to causal in supporting the *environmentally conscious TPB*. Finally, this study acknowledges the potential limitation that by screening based on environmental awareness and collecting data in locations offering green products, the sample may be more representative of environmentally conscious consumers. As such, the findings might more accurately reflect the behavior and perceptions of this subset rather than a broad cross-section of the general population. It is essential to recognize that this methodological choice might impact the generalizability of the results to a wider, diverse audience. Therefore, future research should consider a broader sample, encompassing respondents with varied environmental consciousness levels and from diverse backgrounds, to enhance the scope and applicability of the findings.

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